GOLDEN PREDATOR EXPLORATION LTD.

BREWERY CREEK MINE

2016 ANNUAL WATER LICENCE REPORT

SUBMITTED TO THE YUKON WATER BOARD

WATER USE LICENCE QZ96-007

2016 ANNUAL QUARTZ MINING LICENCE REPORT

SUBMITTED TO YUKON GOVERNMENT, ENERGY MINES AND RESOURCES

YUKON QUARTZ MINING LICENCE A99-001

February 2017

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

The Brewery Creek Mine is currently owned and operated by Golden Predator Exploration Ltd. (Golden Predator), who signed a purchase agreement with Alexco Resource Corp. in early 2012. The property is located in central Yukon approximately 55 km east of Dawson City and was operated as a conventional open pit heap leach continuously from 1996 through 2001; reclamation and closure began in 2002. With the exception of a few remaining site facilities used for site storage and exploration, the mine has been closed and reclaimed. The mine closure and reclamation objectives are outlined in the 2003 Decommissioning and Reclamation Plan (DRP) required under the Water Use Licence.

The mine was operated and closed under Type A Water Use Licence QZ96-007 (originally issued as QZ94-003 in August 1995) and Quartz Mining LicenceA99-001 issued in June 1999. Both licenses expire in 2021. The Water Use Licence was most recently amended in March of 2012 (Amendment 8, QZ11-035), which addressed updated closure conditions and monitoring. Golden Predator also holds a Type B Water Use Licence MN12-038, which was issued in August 2012, and expires on July 5, 2022. Under this licence Golden Predator has the right to obtain groundwater and upgrade the existing septic system on site for a larger camp.

Golden Predator holds a Class 4 Mining Land Use Approval for the Brewery Creek property (LQ00364), which was updated from a Class 3 approval on July 6, 2012. With this Class 4 approval, Golden Predator has been able to extend their exploration beyond the previous licence boundaries.

This report summarizes the 2016 monitoring data and activities relevant to the Water Use Licence QZ96-007, and the Quartz Mining License A99-001. Many aspects of the required monitoring under QZ96-007 and A99-001 have now been completed.

2 OVERVIEW OF ACTIVITIES

As of 2016, under Water-Use Licence QZ96-007, compliance monitoring of surface and groundwater is annual, with the exception of five sites. The following tasks and activities were completed in 2016:

June 2016

- Site inspection;
- Collection of levelogger data; and
- Semi-annual compliance surface water and groundwater monitoring.

August 2016

- Site Geotechnical Inspection.

September 2016

- Site inspection;
- Collection of levelogger data;
- Annual compliance surface water and groundwater monitoring; and
- Inspection, download and winterizing of meteorological station.

3 MONITORING PROGRAMS AND STUDIES

3.1 WATER USE

There was no water withdrawn from the authorized sources (Laura Creek, Lucky Creek, Pacific Creek, Lee Creek, North Fork of the South Klondike River, and the South Klondike River,) or the well located at BC-23 during 2016.

3.2 CLIMATE

Requirements under QZ96-007 for the climatic monitoring is described in the Solutions Management Plan, the Blue Zone Monitoring and Assessment Program, and the Heap Leach Pad Cover and Facilities Monitoring Program. As per these programs, climatic monitoring was discontinued in 2010 under QZ96-007, as the heap was deemed detoxified according to specific monitoring requirements ("detoxification of the heap shall be deemed to have occurred when the concentration of Total Cyanide measured at monitoring station BC-28a in accordance with Schedules A and B is equal to or lower than 2.0 mg/L for five consecutive years of monitoring"). However, Golden Predator continues to perform climatic monitoring even though requirements under QZ96-007 have been fulfilled.

A Campbell Scientific weather station is installed on site and collects weather data continuously. The data are downloaded in conjunction with the compliance water quality and hydrology monitoring program, at which point the station is also inspected to ensure it is functioning properly and any necessary maintenance is performed. The meteorological station was last visited and downloaded on 29 September 2016.

3.3 SURFACE WATER QUALITY MONITORING

3.3.1 *Surface Water Sampling Methods*

Monitoring and sampling was carried out in accordance with the procedures and standards described in the Guidance Document for the Sampling and Analysis of Metal Mining Effluents (April 2001, EPS2/MM/5, Minerals and Metals Division, Environment Canada) (EC, 2001). All samples were preserved and filtered on the day of collection, where applicable, and were kept cool throughout shipment to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids (TSS/TDS);
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, cholride, bromide, ortho-phosphate);
- Dissolved organic carbon (DOC);
- Cyanide (Weak Acid Dissociable and Total); and

- Total and dissolved metals (suite of 33 metals, including all parameters found in the Canadian Council of Ministers of the Environment (CCME) guidelines and Metal Mining and Effluent Regulation (MMER).

QA/QC samples, such as duplicates and field and trip blanks were collected as part of each sampling event.

3.3.2 *Water Quality Guidelines*

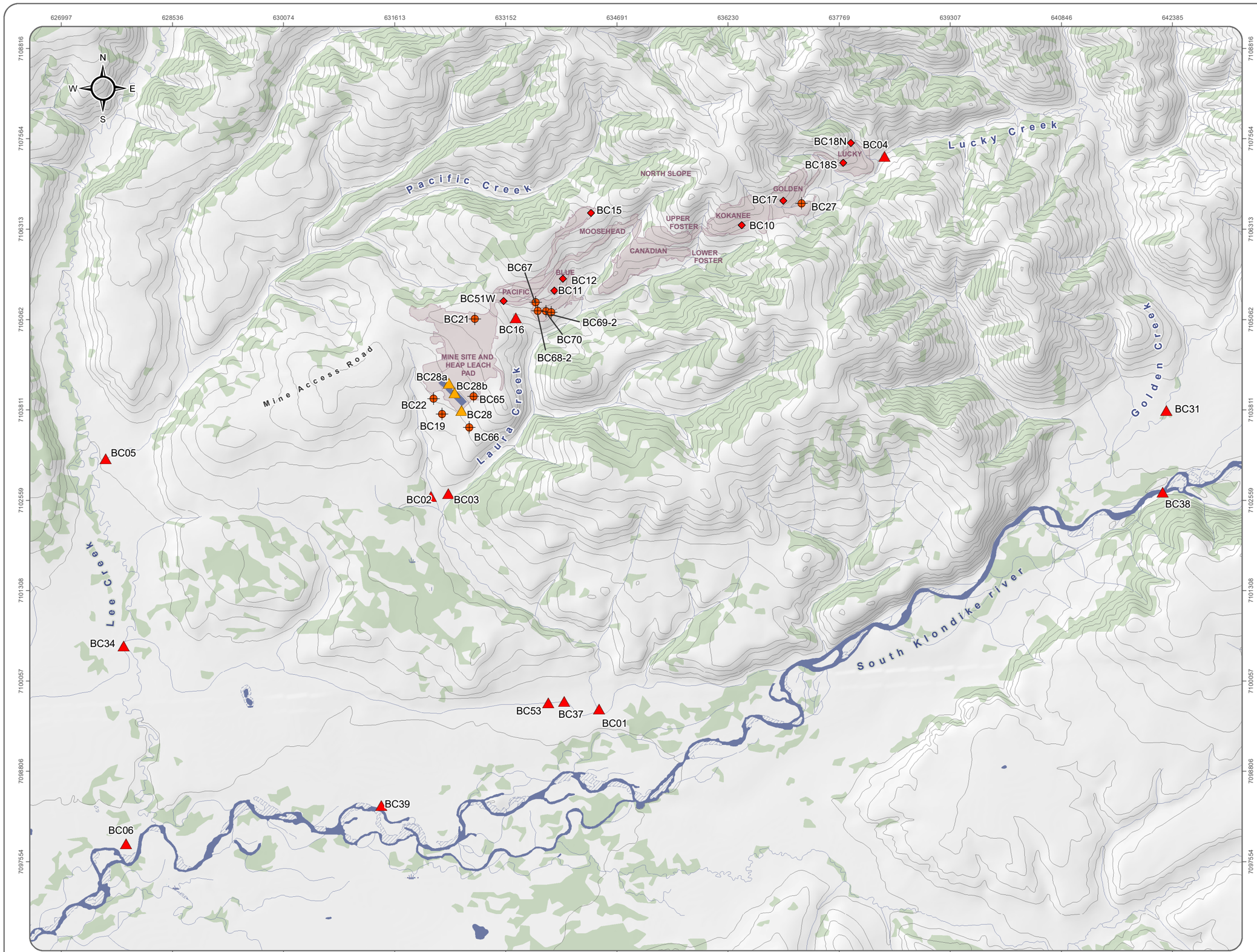
Clause 46 of Water Licence QZ96-007 states that:

"Water quality at monitoring stations BC-31, BC-34 and BC-39 shall not exceed the water quality guidelines specified for the protection of aquatic life contained in the Canadian Environmental Quality Guidelines prepared by the Canadian Council of Ministers of Environment, as amended from time to time."

As such, for the receiving water quality data assessment, water quality parameters were screened against Canadian Water Quality Guidelines for Protection of Aquatic Life (CWQG; CCME 2012), provided in Table 3-1. Some water quality guidelines vary on the basis of water hardness (e.g., cadmium, copper, and lead; CCME 2012). A water hardness of 251 mg/L (as $CaCO_3$) was used in the hardness dependent guideline calculations, the average background concentration is 260 mg/L (2008-2016 data).

Two guidelines have been derived for nitrate under the CCME Water Quality Guidelines for Protection of Aquatic Life based on the species measured; the guideline for ionic nitrate is 13 mg/L, while for nitrate as nitrogen it is 3.0 mg/L.

In addition to the CCME guideline, Laura Creek at station BC-39 has an established site-specific selenium criterion of 0.0038 mg/L as defined as per Clause 38(d) of Water Licence QZ96-007.



BREWERY CREEK MINE

FIGURE 3-1
WATER QUALITY STATIONS

- Surface Water
- Groundwater
- Heap Effluent
- Pit/Dump Discharge

NAD 83 UTM Zone 7N

0 0.5 1 2 Kilometers

1:50,000 (when printed on 11 X 17 inch paper)

ALEXCO ENVIRONMENTAL GROUP

FEBRUARY 2016

D:\Project\All Projects\BreweryCreek\Maps\1_Overview_Maps\WQ_Stations\WQ_Stations_20160224.mxd
(Last edited by: mducharme;2016-02-24/17:54 PM)

Table 3-1: Canadian Water Quality Guidelines

Parameter	Units	Guideline	
		Source	Value
Aluminum [a]	µg/L	CWQG	100
Arsenic	µg/L	CWQG	5
Cadmium [b,c]	µg/L	CWQG	$10^{0.83[\log10(\text{hardness})]-2.46}$
Chromium	µg/L	CWQG	1
Copper	µg/L	CWQG	$e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$
Cyanide - WAD	µg/L	CWQG	5
Iron	µg/L	CWQG	300
Lead [c]	µg/L	CWQG	$e^{1.273[\ln(\text{hardness})]-4.705}$
Mercury	µg/L	CWQG	0.026
Molybdenum	µg/L	CWQG	73
Nickel [c]	µg/L	CWQG	$e^{0.76[\ln(\text{hardness})]+1.06}$
Nitrate Nitrogen	µg/L	CWQG	3000
Selenium	µg/L	CWQG/SSWQS	1/3.8
Silver	µg/L	CWQG	0.25
Thallium	µg/L	CWQG	0.8
Zinc	µg/L	CWQG	30
pH	pH units	CWQG	6.5 - 9.0

[a] *If pH ≥ 6.5*

[b] *Cadmium has two guidelines: one for short term exposure and one for long term exposure. Only the long term guideline is presented here as it is the most conservative.*

[c] *Hardness-dependent; mean reference station hardness of 251mg/L used*

3.3.3 *Surface Water Quality Results*

Surface water quality monitoring stations are presented in Figure 3.1. Water Licence QZ96-007 specifies three compliance points for surface water quality: BC-31, BC-34, and BC-39, that must meet CCME Guidelines for the Protection of Aquatic Life. There were exceedances of these guidelines for iron and aluminum at BC-31, and selenium at BC-31 and BC-34.

The CCME guideline for total selenium is 0.001 mg/L. The results of the September 2016 compliance monitoring trip indicated that both BC-31 (0.0021 mg/L) and BC-34 (0.0022 mg/L) exceeded for selenium. However, it has been previously documented that associated upstream reference stations also exceed the selenium guideline indicating that elevated concentrations of selenium are naturally occurring in the area.

The CCME guideline for total iron is 0.3mg/L and the results of the water quality analysis on BC-31 found 0.363mg/L of total iron. Aluminium has a CCME of 0.1mg/L for ph $\geq$ 6.5 and was measured at 0.177mg/L at BC-31. While BC-36 (background station in same watershed) was not sampled in 2016, previous years show that this baseline station has exceeded the CCME for both aluminium and iron concurrently with BC-31 (i.e., July 26, 2013) indicating the area has naturally high levels.

Compliance station, BC-39, was below the CCME water quality guidelines for all parameters for the September 2016 compliance monitoring event. BC-39 was also under the site specific maximum allowable selenium concentration of 0.0038 mg/L during the monitoring events in 2016.

All surface water data and in situ parameters were summarized and compared to CCME Guidelines for the Protection of Aquatic Life, which are provided in Appendix A. Plots and a brief discussion of historical trends are also included in Appendix A. The original lab reports are provided in Appendix B and field reports are provided as Appendix C, which includes photos of the sites.

3.4 GROUNDWATER QUALITY

3.4.1 *Groundwater Sampling Methods*

Monitoring and sampling was carried out in accordance with the procedures and standards described in the *Standard Guide for Sampling Ground-Water Monitoring Wells* (STM D4448-01, ASTM International, PA, USA). All samples were preserved and filtered on the day of collection, where applicable, and kept cool until shipment to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Dissolved metals (suite of 33 metals at low level detection limits).

QA/QC samples were collected as part of each sampling event.

3.4.2 *Groundwater Results*

There are seven single groundwater wells plus two nested installations for a total of eleven groundwater monitoring wells to be monitored annually under the Water License. Two of these wells, BC-65 and BC-66 (1 and 2), are compliance points that are to be monitored semi-annually if the heap land application is discharging. BC-66(1) is the shallow of the two nested wells and was dry. BC-66 (2) is the deeper well. Water levels and samples were collected on 29th of June and 27th of September of 2016 for BC-65 and BC-66 (2). The results of these two samples were all well below the site specific maximum allowable concentrations specified within Clause 43 of Water Licence QZ96-007, as shown in Table 3-3.

Table 3-2: BC-66 Site Specific Max Allowable Concentrations

Station Name			BC-65	BC-66 (2)	
Description	**Units**	**QZ96-007 Standards**	**Land Application Piezometer**	**Land Application Piezometer (Deep Well)**	
Sample Date			**June and September 2016**	**29/06/2016**	**27/09/2016**
Ammonia Total	mg/L	7.5	Well was dry for both sampling events	0.022	<0.0050
Cyanide, Total	mg/L	1		0.00668	0.00589
Cyanide, Weak Acid Dissociable	mg/L	0.125		0.00416	0.00373
Aluminum (Al), Dissolved	mg/L	3		0.00109	<0.00050
Antimony (Sb), Dissolved	mg/L	0.5		0.00014	0.000136
Arsenic (As), Dissolved	mg/L	0.25		0.000131	0.000206
Bismuth (Bi), Dissolved	mg/L	0.25		<0.0000050	<0.0000050
Cadmium (Cd), Dissolved	mg/L	0.05		0.000017	0.000059
Chromium (Cr), Dissolved	mg/L	0.24		<0.00010	0.00012
Copper (Cu), Dissolved	mg/L	0.1		0.000501	0.000317
Iron (Fe), Dissolved	mg/L	5		0.0017	<0.0010
Lead (Pb), Dissolved	mg/L	0.1		0.000008	0.000009
Manganese (Mn), Dissolved	mg/L	6		0.000152	0.000174
Molybdenum (Mo), Dissolved	mg/L	0.25		0.000137	0.000179
Nickel (Ni), Dissolved	mg/L	0.25		0.000207	0.000428
Selenium (Se), Dissolved	mg/L	0.3		0.0144	0.0148
Silver (Ag), Dissolved	mg/L	0.05		<0.0000050	<0.0000050
Zinc (Zn), Dissolved	mg/L	0.25		0.00285	0.00246

In September 2016, seven wells were successfully sampled, while the remaining wells were either frozen, blocked, or dry. All of the water level data and water sampling data for the remaining wells are provided in Appendix A which also includes plots and a brief discussion of historical trends. The original lab reports are provided in Appendix B and field reports are provided as Appendix C, which includes photos of the sites.

3.5 IN-PIT AND HEAP EFFLUENT MONITORING STATIONS WATER QUALITY RESULTS

3.5.1 *Methods*

Mined out pits were used effectively as sediment control basins. Snow melt and precipitation run-off was directed to the closest inactive pit. Samples from all pits were taken from surface standing water within each pit. All samples were preserved and filtered on the day of collection, where applicable, and were kept cool until shipment to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Total and dissolved metals (suite of 33 metals, at low level detection limits).

QA/QC samples were collected as part of each sampling event.

3.5.2 *Effluent Quality Standards*

During the 2012 Mine Engineering Inspection, Brewery Creek mine was completing management of the waters stored in the ponds below the heap. Inspection of the discharge channel from the outflow of the overflow pond siphon pipe (final discharge point) has demonstrated each year that the discharge water goes to ground and does not enter any receiving surface water directly. The heap effluent now infiltrates into the ground within the reclaimed ponds which meets water licence requirements.

In 2016, no effluent was discharged from the heap or the biological treatment or overflow ponds, and as such the effluent quality standards prescribed in Clause 44 do not apply. BC-28 was not flowing as there is no discharge from pond 3: the water level was low. BC-28A is the discharge from the heap into the first pond which is by way of a valve. The valve was opened at 15:05 and sampled at 18:00 to purge the line as much as possible. BC-28B was sampled on the southeast side of the pond as the overflow channel to pond 3 was not flowing.

The lysimeter compliance point, BC-70, is held to the same site specific maximum allowable standards as the wells, BC-65 and BC-66. The lysimeter reservoir was dry during each compliance monitoring trip and could therefore not be sampled. It is not known why BC-70 fails to accumulate water, the above ground installation has been checked for obvious damage.

3.5.3 *Results*

There are twelve mine water related sites that require monitoring under QZ96-007 including pit water/discharge and effluent from the heap. Seven of those twelve sites had water present. Several are

reclaimed areas that no longer have runoff or standing water. Those sites with "discharge" in their description tend to only have standing pit water.

In-pit and heap effluent samples were collected from the following stations:

- BC-10: Kokanee Pit and Dump;
- BC-12: Blue Pit;
- BC-15: Moosehead Pit;
- BC-17: Golden Pit and Dump;
- BC-28: Overflow Pond;
- BC-51W: Pacific Pit; and
- BC-53: Laura Creek Wetland.

Stations located at BC-9 (Upper Foster Pit and Dump), BC-13 (Moosehead West Waste Dump) and BC-14 (Moosehead East Waste Dump) were removed from licence QZ96-007 in Amendment #8 and are therefore no longer required to be monitored.

Some observations from September 2016 sites visited:

- Lucky pit and dump sites, BC-18N and BC-18S, do not have water present. These sites have been reclaimed; BC-18N is a dry flat area and BC-18S is a grassy reclaimed hillslope with trees starting to fill in. These sites should be removed from the monitoring schedule;
- Pacific gulch, BC-16, is the overflow draining from Pacific pit. This channel is dry and appears to have been for some time. Previous evidence of spring runoff eroding the road and flowing down this gulch has been repaired, but this water would not be associated with Pacific Pit;
- BC-11, Blue Waste Dump, is a reclaimed waste rock storage area with a 0.5-metre soil cover with no signs of surface water running at any time of year, it is being rapidly reclaimed by trees; and
- pH levels in Pacific Pit (BC-51W) remained consistently low since 2008 and again were observed to be low in 2016.

3.6 BIOASSAY MONITORING

Bioassays were not collected during 2016 as the site was not actively discharging.

3.7 HYDROLOGY

Stream flow measurements for stations situated along Laura Creek, Golden Creek, Lucky Creek, Lee Creek, and Pacific Creek were conducted in 2016 during the regularly scheduled monitoring period (June and September), where conditions allowed. Measurements were taken according to the procedures and standards described in the *Guidance Document for Flow Measurement of Metal Mining Effluents* (April 2001, EPS 2/MM/4, Mineral and Metal Division, Environment Canada), and all data are presented in Table 3-4.

Table 3-3: Summary table of 2016 Stream Flow Measurements

Station	Discharge (L/s)	
	30-June-2016	28-Sept-2016
BC-1	144	159
BC-2	-	No data
BC-3	-	115
BC-4	-	38
BC-5	-	172
BC-31	-	856
BC-37	389	No data
BC-39	-	3.8
BC-53	-	120

Due to BC-53's difficult access, it was recommended that BC-37 become the site for BC-53. BC-37 is located a few hundred metres upstream and water quality, as well as discharge should be effectively similar.

3.8 SEDIMENT AND BENTHIC MONITORING

There was no sediment or benthic monitoring completed in 2016, as water licence requirements for this site were only required until 2009. Sediment and benthic monitoring were last completed in 2012 as part of Golden Predator's extended baseline monitoring program at Brewery Creek.

3.9 LEAK DETECTION AND RECOVERY SYSTEMS

The leak detection piping and collection system remains intact but the monitoring of (LDRS) systems was discontinued in 2005, consistent with long-term closure plans and the fact the heap has been fully decommissioned and drained.

3.10 AIR QUALITY

No air quality monitoring for mercury emissions was conducted in 2016. Refining activities were discontinued resulting in the dismantlement of the ADR facility in 2004.

3.11 EFFECTS ON WILDLIFE

The fence constructed in June 2006 to prevent wildlife from entering the process ponds was removed in 2008 during the final reclamation of the ponds. There is no liner remaining on site to pose any wildlife entrapment risk. The site was inspected regularly throughout the year and there were no wildlife mortalities observed during 2016. Among the wildlife observed throughout the year were moose, and porcupine, as well as caribou signs.

4 ADDITIONAL PLANS AND STUDIES

4.1 ADAPTIVE MANAGEMENT PLAN

As part of the Adaptive Management Plan there are actions to be taken if BC-39 exceeds the site specific maximum allowable total selenium concentration of 3.8 µg/L. However, the concentration of selenium at BC- 39 in 2016 was 0.59 µg/L, and therefore did not trigger any mitigative actions.

4.2 IMPACT STUDY OF LOWER LAURA CREEK

The purpose of the study is to characterize the potential effects to lower Laura Creek and the South Klondike River resulting from the release of effluents from the project. The report summarizes data collected as part of the licensed monitoring program conducted on Laura Creek and the South Klondike River during the period 2008 – 2016. As per Water-Use LicenceQZ96-007 the Lower Laura Creek Impact Study is submitted every three years with the last study conducted in 2013.

The 2016 Lower Laura Creek Impact Study reviewed the results from the surface water quality program and compared the existing Water Use Licence parameters and CCME Guidelines to assess downstream receiving water effects. Based on the results of this study, the water quality of lower Laura Creek is unchanged from historic conditions.

The complete Lower Laura Creek Impact Study is provided as Appendix D.

5 REAGENT AND WASTE MANAGEMENT

5.1 SPILL OCCURRENCE AND RESPONSE

There were no reportable spills that occurred in 2016.

5.2 REAGENT STORAGE AND HANDLING

Other than some miscellaneous laboratory chemicals, there are no reagents or chemicals in storage at the Brewery Creek Mine.

6 WATER MANAGEMENT

6.1 DIRECT RELEASE

There was no direct release of solution in 2016. Heap drainage is diverted into the barren pond (biological treatment cell) and overflows into the overflow pond where it infiltrates into the ground. The infiltrating water meets water licence discharge requirements. Heap surface water is directed to the pregnant pond (now sediment settling pond) where it likewise infiltrates into the ground. In 2016, no effluent was discharged from the heap or the biological treatment or overflow ponds, and as such the effluent quality standards prescribed in Clause 44 do not apply. Samples BC-28, 28a, and 28b were collected in September 2016 from each of these sites but the water sampled is still water that is pooling faster than infiltration can occur.

Vista Tek Ltd. reported that at the time of the 2014 inspection, the barren pond was noted to be approximately 90% full and the overflow pond and pregnant ponds approximately 25% full. Golden Predator (per. com. 2014 Mike Maslowski, Director Operations to Victor Menkal, P. Eng.) has indicated that they are evaluating alternatives to undertake management of the water contained in the pond on a long term basis.

7 GEOTECHNICAL INVESTIGATION

A geotechnical engineering inspection is required under Water Use LicenceQZ96-007 every five years, starting in 2009. The last inspection conducted was by Victor Menkal, P.Eng. of Vista Tek Ltd. in 2014. Under the current QML A99-001 an annual inspection is required every two years, as such an inspection was conducted in 2016.

The 2016 inspection was conducted by Justin Pigage, P.Eng of Tetra Tech EBA Inc. in August 23rd and 24th. The inspection included:

- Primary Haul Road (from Golden Predator camp to Lucky Property);
- Historic Processing Facilities (ore pad, heap leach pad and containment dyke, process ponds); and
- Mine Pits and Dumps (Pacific, Blue, Canadian, Moosehead, Fosters, Kokanee, Golden, and Lucky).

The results of the inspection found no remedial action required, the surface engineered earth structures pose no significant risk to the environment or human health and safety in their current condition. The annual geotechnical inspection has been provided as Appendix E.

8 CONCLUSION

A summary of the key points of this report are as follows:

- There was no direct release of solution in 2016. The heap drainage is diverted into the barren pond which passes into the overflow pond where it infiltrates into the ground. Heap surface water is directed to the pregnant pond (now sediment settling pond) where it likewise infiltrates into the ground. The ponds are partially filled as precipitation and run-off is greater than the infiltration rate. As there was no discharge in 2015 the BC-28, 28a, or 28c samples did not trigger the effluent quality standards in Clause 44.

- Water LicenceQZ96-007 specifies three compliance points for surface water quality:

    - BC-34 must meet CCME Guidelines for the Protection of Aquatic Life. BC-34 had an exceedance of selenium. However, background water quality has been shown to have exceedances indicating elevated levels occur naturally.

    - BC-31 must meet CCME Guidelines for the Protection of Aquatic Life. There were exceedances of selenium, iron and aluminum. However, background water quality has been shown to have exceedances indicating elevated levels occur naturally.

    - BC-39, was below the CCME water quality guidelines for all parameters for the September 2016 compliance monitoring event. The BC-39 sampling event was also below the site specific maximum allowable selenium concentration of 0.0038 mg/L in 2016.

- The wells BC-65 and BC-66, are compliance points for the site. BC-65 was dry in 2016. BC-66 is the deeper well and water levels and samples were collected in September and June of 2016. The results of BC-66 were all well below the site specific maximum allowable concentrations specified within Clause 43 of Water LicenceQZ96-007.

- The lysimeter compliance point, BC-70, is held to the same site specific maximum allowable standards as the wells, BC-65 and BC-66. The lysimeter reservoir was dry during each compliance monitoring trip and could therefore not be sampled.

9 REFERENCES

Canadian Council of the Ministers of the Environment, 2012. *Canadian Water Quality Guidelines for the Protection of Aquatic Life*.

Environment Canada (EC), 2001. *Guidance Document for the Sampling and Analysis of Metal Mining Effluents (EPS 2/MM/5 – April 2001)*

APPENDIX A

SURFACE WATER QUALITY AND GROUNDWATER DATA SUMMARY

ALEXCO ENVIRONMENTAL GROUP

BREWERY CREEK MINE

2016 WATER QUALITY ASSESSMENT

February 2017

Prepared for:

GOLDEN PREDATOR EXPLORATION LTD.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

Mining activities were carried out at the Brewery Creek Mine over a five-year period between 1996 and 2000 by Loki Gold Corp. and Viceroy Resource Corp. Ore processing (9.5 million tonnes of ore) employed conventional heap leach technology on run of mine ore, commencing in November 1996. Brewery Creek originally operated under Water Use Licence (WUL) QZ94-003, issued in August 1995 and under Quartz Mining License (QML) A99-001 issued in June 1999. In July 1997 the mine began operating under WUL QZ96-007, created as a result of an amendment application to WUL QZ94-003. Brewery Creek ceased active mining operations in September of 2000 and no additional ore was added to the heap leach after this date. This cessation date was more than two years earlier than predicted in the planning and permitting stages, due primarily to depressed gold prices. Active cyanide leaching of the heap leach pad continued until December 2001. Detoxification of the heap leach was completed in the second and third quarters of 2002 with some release of detoxified waters over 2002 and 2003 and regular post closure monitoring. In March 2005 licences and permits were again transferred, from Viceroy to Alexco Resource Corp. (after Alexco purchased the property (Access, 2010).

In 2011, Alexco applied for an amendment QZ11-035 to licence QZ96-007 with the aim of clarifying and unifying licence conditions to reflect the current post-closure phase of the mine, in anticipation of a transfer of ownership to Golden Predator Corp. (now Golden Predator Exploration Ltd.). In 2012 Golden Predator Corp. purchased the Brewery Creek property from Alexco with the intent of amending the Water Licence to re-open the mine site.

The subject of this report is an examination of the results of the 2016 water quality monitoring program carried out by Golden Predator at the Brewery Creek Mine pursuant to the licence conditions of WL QZ96-007. The results and discussion herein include results of all sampling carried out over the course of the mine life, including a discussion of the 2016 data relative to historical conditions. The 2016 monitoring program reflects the current post-closure phase of the mine life.

The principal receiving creeks in the Brewery Creek Mine area are Lee Creek, Laura Creek, and Carolyn Creek which are tributaries of the South Klondike River. Three additional creeks are included in this assessment: Pacific Creek, Carolyn Creek, and Lucky Creek, the main tributaries to Lee, Laura and Golden Creeks, respectively (Figure 1-1).

Lee Creek and Pacific Creek both occur in the northwest portion of the Brewery Creek property. Lee Creek headwaters originate 46 kilometres north of the property and flow due south, converging with Pacific Creek east of the property, eventually flowing into the South Klondike River. Pacific Creek headwaters originate immediately north of the mine in two separate forks, which converge and flow southwest into Lee Creek.

Laura and Carolyn Creeks receive runoff from a total combined area of 30.5 km^2. Flow in the upper reaches of these creeks is seasonal, while lower Laura Creek[1] flows year round with the exception of occasional freezing

[1] Lower Laura Creek refers to the portion of Laura Creek between stations BC-53 and BC-39

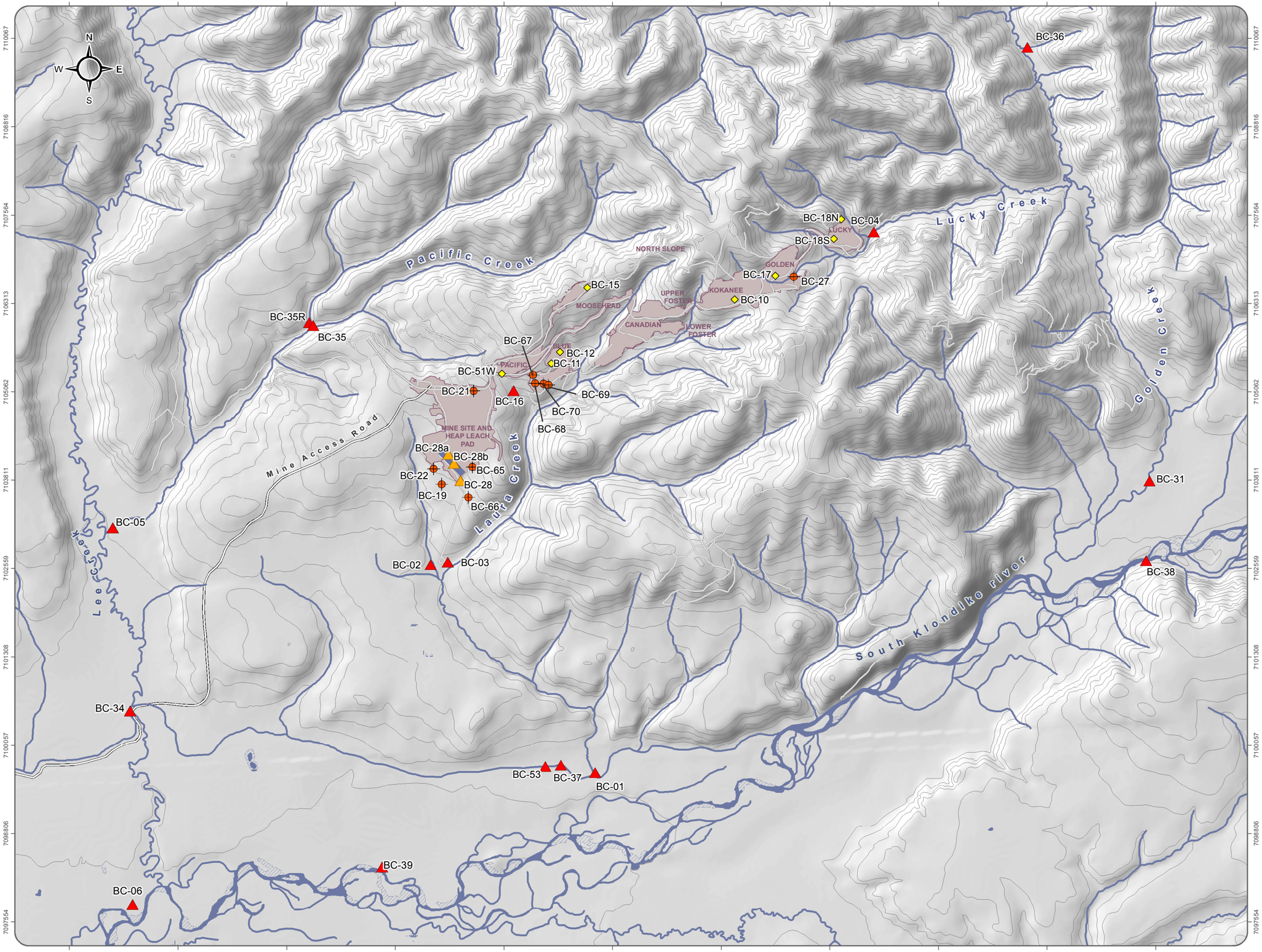
conditions in winter. Carolyn Creek joins Laura Creek roughly two kilometres from its headwaters, with both eventually flowing to the South Klondike River via a wetlands area in lower Laura Creek.

Laura and Carolyn Creeks were the historical receivers for mine effluent deposited from the Brewery Creek heap leach pad both during mining activities and post-closure reclamation. The leach pad and ponds were situated within the boundary of the two watersheds, and a land application system was employed during post-closure drain-down of the heap over the watershed boundary separating the streams.

The historical workings consist of seven open pit areas (nine pits total), which influenced the receiving watersheds variously. The following pits were worked during the past phase of mining at Brewery Creek:

- Pacific;
- Blue;
- West Canadian;
- Canadian;
- Upper Fosters;
- Lower Fosters;
- Kokanee;
- Golden; and
- Lucky.

The majority of mining occurred in the Laura Creek drainage; the Pacific, Blue, Canadian, Fosters and Kokanee developments, as well as a significant portion of the Moosehead development and the heap leach facility are all located within the Carolyn and Laura Creek watersheds. The Golden and Lucky developments lie within the Lucky Creek watershed, while the Moosehead pit also lies partially within the Pacific Creek catchment.



GOLDEN PREDATOR
TSX: GPD

BREWERY CREEK MINE

FIGURE 1-1

REGIONAL STREAMS AND WATER QUALITY MONITORING STATIONS

- Surface Water
- Groundwater
- Heap Effluent
- Pit/Dump Discharge
- Access Road
- Other Roads/Trails
- Contour (100 m interval)

NAD 83 UTM Zone 7N

0 0.5 1 2 Kilometers

1:52,000 (when printed on 11 X 17 inch paper)

ALEXCO ENVIRONMENTAL GROUP

JANUARY 2017

D:\Project\All\Projects\BreweryCreek\Maps\1-Overview_Maps\WQ_Stations\04-GW_AND_SW\WQ_Stations_20170127.mxd
(Last edited by: mduchame; 1/27/2017 09:11 AM)

2 BREWERY CREEK MINE WATER QUALITY MONITORING PROGRAM

2.1 MONITORING PROGRAM

Environmental monitoring at Brewery Creek has transitioned to the post-closure phase, which as of 2016 involves annual monitoring of water quality surveillance sites where conditions allow. Sampling events are typically conducted in September or October, during lower-flow conditions. The amount of environmental monitoring has declined since closure of the heap has been accomplished and the drain down solutions treated. Environmental monitoring under QZ96-007 during the post-closure period has been reduced commensurate with the expected level of site activity. The current water quality monitoring schedule is presented in Appendix A. Water quality sampling was performed as required by Schedule B of Water Licence QZ96-007, and results can be found in Appendix B to this memo.

2.2 EFFLUENT QUALITY STANDARDS AND WATER QUALITY GUIDELINES

Clause 46 of Water Licence QZ96-007 states that:

"Water quality at monitoring stations BC-31, BC-34 and BC-39 shall not exceed the water quality guidelines specified for the protection of aquatic life contained in the Canadian Environmental Quality Guidelines prepared by the Canadian Council of Ministers of Environment, as amended from time to time."

As such, for the receiving water quality data assessment, water quality parameters were screened against Canadian Water Quality Guidelines for Protection of Aquatic Life (CWQG; CCME 2012) (Table 2-1). Some water quality guidelines vary on the basis of water hardness (e.g., cadmium, copper, lead; CCME 2012). A water hardness of 251 mg/L (as $CaCO_3$) was used in the hardness dependent guideline calculations, the average background concentration is 260 mg/L (2008-2016 data).

Two guidelines have been derived for nitrate under the CCME Water Quality Guidelines for Protection of Aquatic Life based on the species measured; the guideline for ionic nitrate is 13 mg/L, while for nitrate as nitrogen it is 3.0 mg/L. For results obtained prior to 2006, information on the nitrogen species measured is not available; therefore, the more conservative guideline of 3.0 mg/L has been used for comparisons.

In addition to the CCME guideline, Laura Creek at station BC-39 has an established site-specific selenium criterion of 0.0038 mg/L as defined as per Clause 38(d) of Water Licence QZ96-007. Furthermore, the Laura Creek AMP (2004) indicated the company would also use a site specific selenium water quality objective (SSWQO) of 0.0038 mg/L at Laura Creek station BC-53. Therefore, this report includes the use of the SSWQO guideline for comparison on the Laura Creek and Carolyn Creek watersheds.

Table 2-1: Relevant Canadian Water Quality Guidelines Used in the Assessment

Parameter	Units	Guideline	
		Source	Value (mg/L)
Antimony	mg/L	Ontario PWQO	0.02
Arsenic	mg/L	CWQG	0.005
Copper [a]	mg/L	CWQG	0.003
Lead [a]	mg/L	CWQG	0.007
Nitrate Nitrogen	mg/L	CWQG	3.00
Selenium	mg/L	CWQG/SSWQO	0.001/0.0038
Zinc	mg/L	CWQG	0.03
Total Suspended Solids	mg/L	n/a	n/a

[a] *Hardness-dependent; mean reference station hardness of 251mg/L used*

For the receiving environment water quality assessment, a reference condition has also been established using pooled reference data for the Brewery Creek region collected between 2008 and 2012. These values reflect the upper limit on the range of variability in the region and can be used together with CCME guidelines and Water Licence standards, or where guidelines and standards are not available or appropriate. These reference guidelines are used in this report for comparison and assessment of the Lee Creek and Golden Creek watersheds. It has been determined that these reference conditions are not appropriate for use in the Laura Creek watershed, where reference data were not available for use in developing the reference condition.

For effluent and groundwater monitoring stations relating to heap effluent discharge via direct discharge and groundwater infiltration, water quality results were screened against the effluent quality standards established in Clause 42, 43 and 44 of WL QZ96-007 (Table 2-2). Clause 42 and 44 of the licence refer to standards for heap discharges either via land application or directly to surface water. Clause 43 refers to standards for groundwater stations immediately down gradient of the heap.

Table 2-2: Effluent Quality Standards (mg/L), Water License QZ96-007

Parameter	Maximum Concentration (mg/L)		
	Clause 42	Clause 43	Clause 44
WAD Cyanide	0.25	0.125	0.25
Total Cyanide	2.0	1.0	2.0
Ammonia (as N)	15.0	7.5	5.0
Copper	0.5	0.1	0.2
Arsenic	0.5	0.25	0.5
Antimony	1.0	0.5	1.0
Mercury	0.005	0.0025	0.005
Zinc	0.5	0.25	0.5
Selenium	0.75	0.3	0.25
Lead	0.2	0.1	0.2
Aluminum	1.0	3.0	1.0
Bismuth	0.5	0.25	0.5
Cadmium	0.1	0.05	0.1
Chromium	0.5	0.25	0.5
Iron	1.0	5.0	1.0
Manganese	2.0	6.0	2.0
Molybdenum	0.5	0.25	0.5
Nickel	0.8	0.25	0.5
Silver	0.1	0.05	0.1
pH	-	-	6.0 to 9.5
Suspended Solids	-	-	50

3 WATER QUALITY

3.1 RECEIVING ENVIRONMENT WATER QUALITY CONDITIONS

The following sections address the three main watersheds and tributaries in the project area, which are each assessed on three different levels. First, where relevant, a comment on the quality of the data is made with respect to both method detection limit (MDL) and the occurrence of zero values in the dataset for selected parameters. Second, the data is assessed in relation to the benchmark concentrations selected for this assessment (CCME and reference). Third and lastly, summary statistics and trends in the data are discussed, with a focus on the 2016 data in relation to historical results. At the end of each watershed chapter, the discussion expands to identify issues more broadly associated with each watershed on the whole, and summary remarks are made.

All water quality data for surface water, groundwater, and in-pit water is presented in summary tables within Appendix A.

3.1.1 Lucky and Golden Creeks

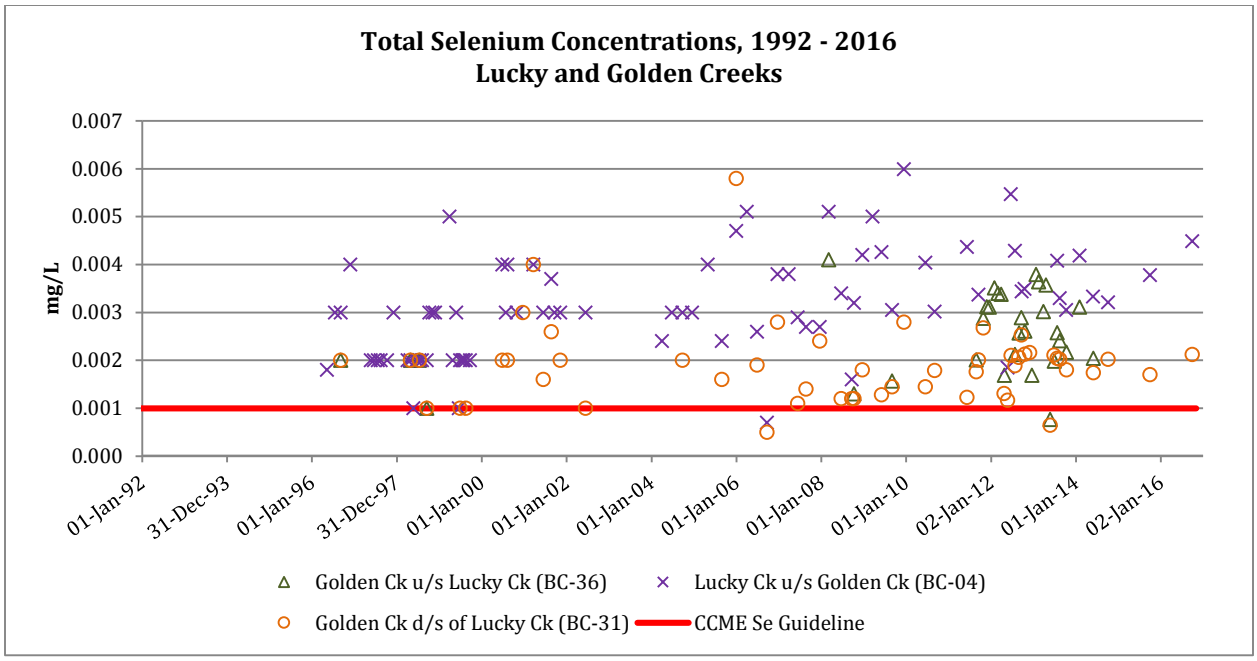
A total of three stations were established on Lucky and Golden Creek catchments to determine and assess water quality characteristics (Table 3-1). BC-04 is located on Lucky Creek below all mine related developments, and thus reflects the cumulative impact of all mining activities on that stream. Two stations are located on Golden Creek, one upstream of the confluence with Lucky Creek (BC-36), and the other downstream of it (BC-31). Monitoring at BC-31 began in 1991, before the commencement of mining, while monitoring at BC-04 began in 1995, shortly before mining commenced. BC-36 has been monitored periodically, beginning in 1996 for a year, and resuming again in mid-2007 until 2014.

Table 3-1: Water Quality Monitoring Stations on Lucky and Golden Creeks

Stations on Lucky and Golden Creeks		Included in Assessment
BC-36	Golden Creek upstream of Lucky Creek	Yes
BC-31	Golden Creek downstream of Lucky Creek	Yes
BC-04	Lucky Creek d/s from Lucky Pit	Yes

3.1.1.1 Selenium

Selenium concentrations exceeded the CCME guideline in all samples and at all sites on Lucky and Golden Creeks in 2016. Data collected during monitoring prior to 2004 was confounded by the presence of high MDLs. Lower detection limits were recent years, which confirmed that both background and receiving waters exceeded the CCME guideline. Trends for selenium show no change over the last decade, as shown on Figure 3-1.



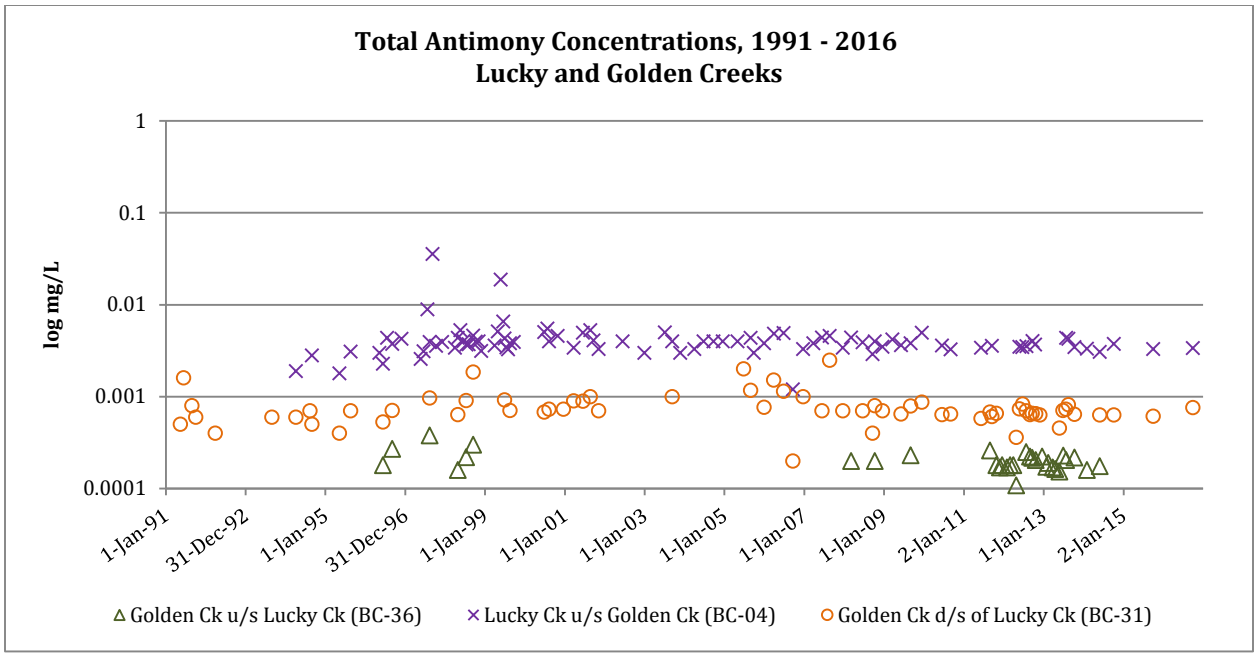
Note: Results that are below MDL are not shown on this figure

Figure 3-1: Selenium Concentrations on Lucky and Golden Creeks (1992-2016)

3.1.1.2 Antimony

Antimony concentrations at the background station on Golden Creek (BC-36) were significantly lower than at the downstream receiving environment station (BC-31), as shown on Figure 3-2. Concentrations of antimony were much higher in Lucky Creek (mean background concentration at BC-36 was 1/20th of the concentration at BC-04), suggesting that Lucky Creek is likely the primary source of antimony entering Golden Creek.

Antimony results at BC-31 have remained relatively constant throughout the pre-mining, mining, and decommissioning and reclamation phases of the mine life, indicating that antimony concentrations may not have been impacted greatly by mining activities. Moreover, concentrations remained well below the Ontario preliminary water quality objective (PWQO) for antimony (0.20 mg/L).

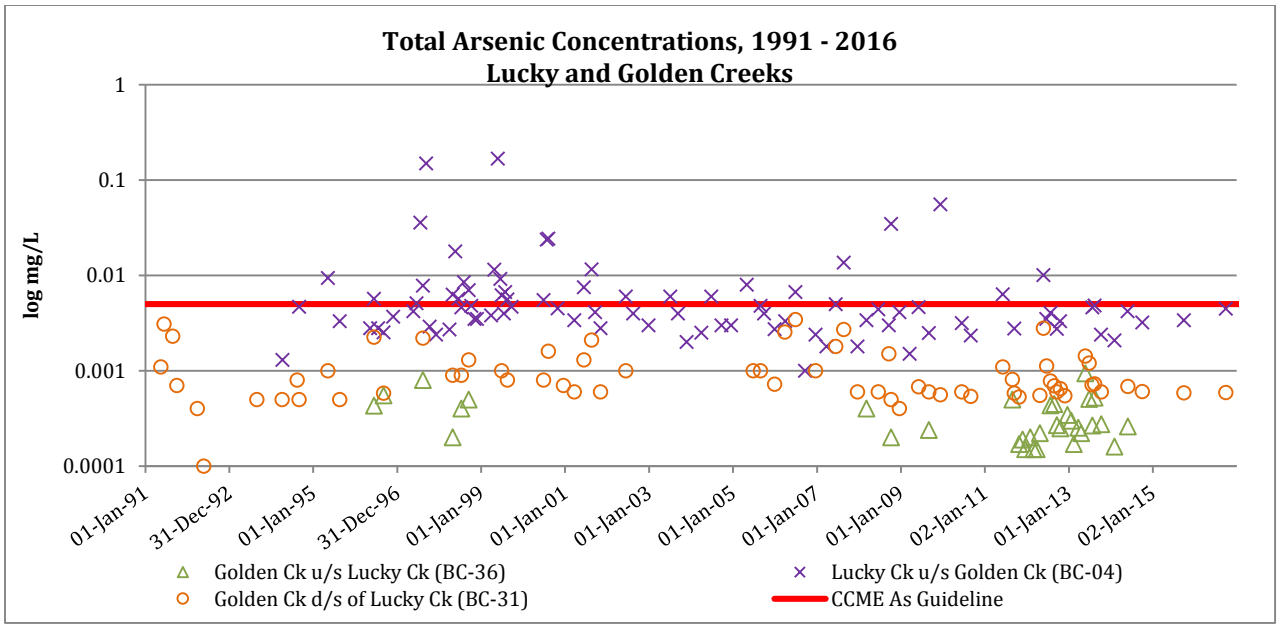


Note: Results that are below MDL are not shown on this figure

Figure 3-2: Antimony Concentrations on Lucky and Golden Creeks (1991-2016)

3.1.1.3 Arsenic

Arsenic concentrations in Golden and Lucky Creek exhibited a similar pattern to antimony, with the data suggesting that Lucky Creek was the primary source of arsenic to Golden Creek, as shown on Figure 3-3. Arsenic concentrations were consistent through all three mine phases, with a high background concentration as the result of the region's natural mineralization. Results at BC-04 were at or near the CCME guideline, exceeding the guideline in approximately 40% of samples all samples collected.



Note: Results that are below MDL are not shown on this figure

Figure 3-3: Arsenic Concentrations on Lucky and Golden Creeks (1991-2016)

3.1.1.4 Conditions during Decommissioning and Reclamation

Water quality data collected in the Lucky and Golden Creek watershed indicated no increasing or decreasing trend for the major parameters assessed in this report, or those regulated under QZ96-007. Data for all parameters assessed were generally at or below CCME guidelines with the exception of selenium, which appears to be naturally elevated in this region.

Additional parameters zinc, copper, lead, total suspended solids and nitrate are presented graphically in Appendix B for Lucky and Golden Creeks.

3.1.2 Lee and Pacific Creeks

Five water quality monitoring stations were established between Lee and Pacific creeks; two on Lee Creek and three on Pacific Creek, as detailed in Table 3-2. Each creek contains one reference station, and at least one receiving environment station. The reference stations were used in establishing the reference benchmark for the watershed, while the receiving stations will be assessed here relative to those benchmarks.

Table 3-2: Water Quality Monitoring Stations on Pacific and Lee Creeks

Stations on Pacific Creek and Lee Creek		Included in Assessment
BC-35R	Pacific Creek Reference Station	Yes
BC-33	Lee Creek Reference Station	Yes
BC-35	Pacific Creek below Leach Pad	No
BC-05	Pacific Creek before confluence w/ Lee Creek	Yes
BC-34	Lee Creek below confluence w/ Pacific Creek	Yes

Station BC-35 on Pacific Creek was impacted by previous developments in the northern region of the property, including the Moosehead pit; however, station BC-05 is better situated to represent the cumulative downstream impacts of mining on this Creek. Additionally, data is not available for BC-35 earlier than 2008, which limits the usefulness of this station for background information. As such, BC-35 was not used or considered in this assessment.

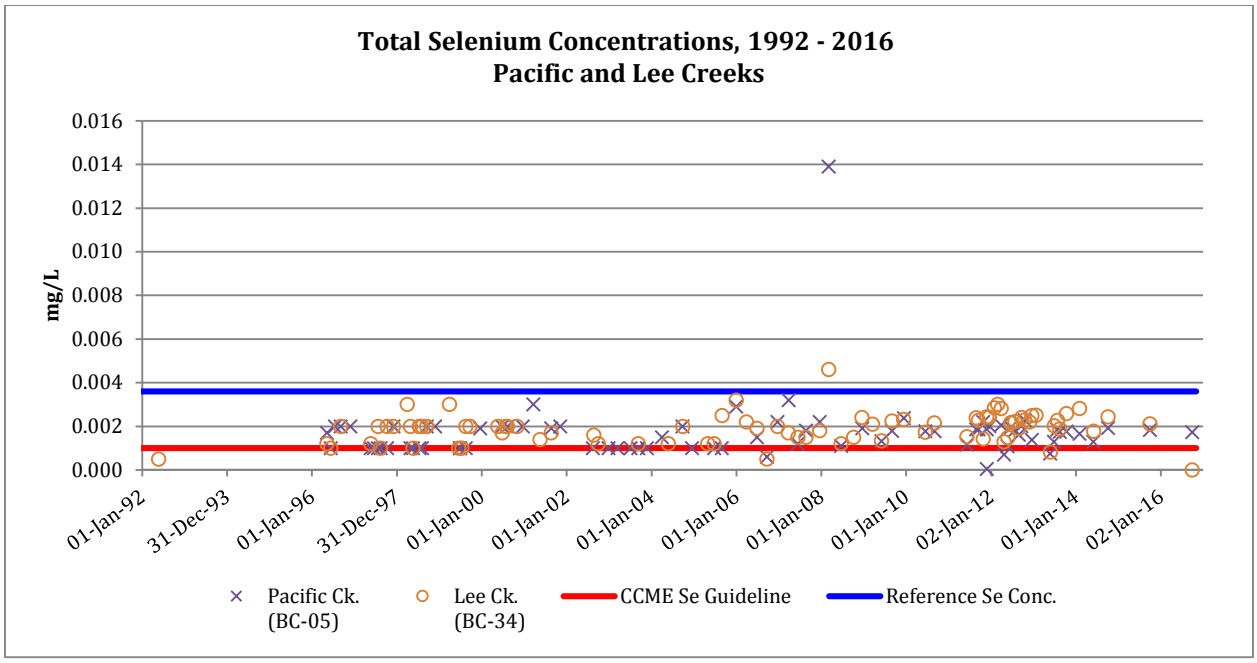
In August 2011, a new reference station (BC-35R) was established on the north branch Pacific Creek as a result of a lack of available background data for this stream. Data collected at this station was used in establishing the reference conditions referred to in Section 2.2

3.1.2.1 Selenium

The interpretation of selenium results obtained on Lee and Pacific Creeks were confounded by the occurrence of high MDLs for the entire dataset, and zero values on some early dates prior to mining. The typical MDL observed was 0.001 mg/L, which precludes an interpretation of the data with respect to the CCME guideline (also 0.001mg/L). Although it is known that these values are below the CCME guideline of 0.001mg/L, it is not known to what degree. In addition, among all other results only two show values higher than a practical quantitative limit set at 3X the MDL. These results can be seen in Figure 3-4 as a flat line in the data series prior to 2002, and vary after that date. In the presence of high MDLs and lacking additional information, it is unclear at what rate selenium results exceed the CCME guideline, or to what degree they are below.

Despite these challenges, the pooled reference dataset for 2008 – 2016 provided insight into background conditions for the watershed. Selenium turned out to be one of two parameters, the other being copper, for which the reference condition was higher than the CCME guideline, and therefore a more appropriate benchmark for comparison.

Of all observations, only two were higher than the reference condition, both in 2008, as shown Figure 3-4, leading to a low rate of results exceeding the benchmark. Also notable was the low variability in selenium concentrations over the entire record; results were generally at or near the MDL for all samples collected. None of the results obtained in 2016 exceeded the background condition in the downstream receiver on Lee Creek (BC-34), although the results were in excess of the CCME guideline.



Note: Results that are below MDL are not shown on this figure

Figure 3-4: Selenium Concentrations on Pacific and Lee Creeks (1992-2016)

3.1.2.2 : Antimony

Antimony results were not generally problematic with respect to high MDLs, except over one period at each station (BC-34: mid-2002 through mid-2005; BC-05: 2002 through mid-2005). In these cases, MDLs were higher than the reference concentration, but lower than the CCME guideline. Overall concentrations showed little variability from the 0.0003 mg/L reference benchmark, or between non-mining, mining, and reclamation periods, as shown on Figure 3-5. The mean at both station BC-05 (Pacific Creek receiver) and BC-34 (Lee Creek receiver) was less than the Ontario PWQO by two orders of magnitude.

In Pacific Creek, antimony exhibited consistently higher results at the downstream receiver station than the reference benchmark, including during pre-mining. None of the results obtained in 2016 exceeded the Ontario PWQO for antimony in the downstream receiver on Lee Creek.

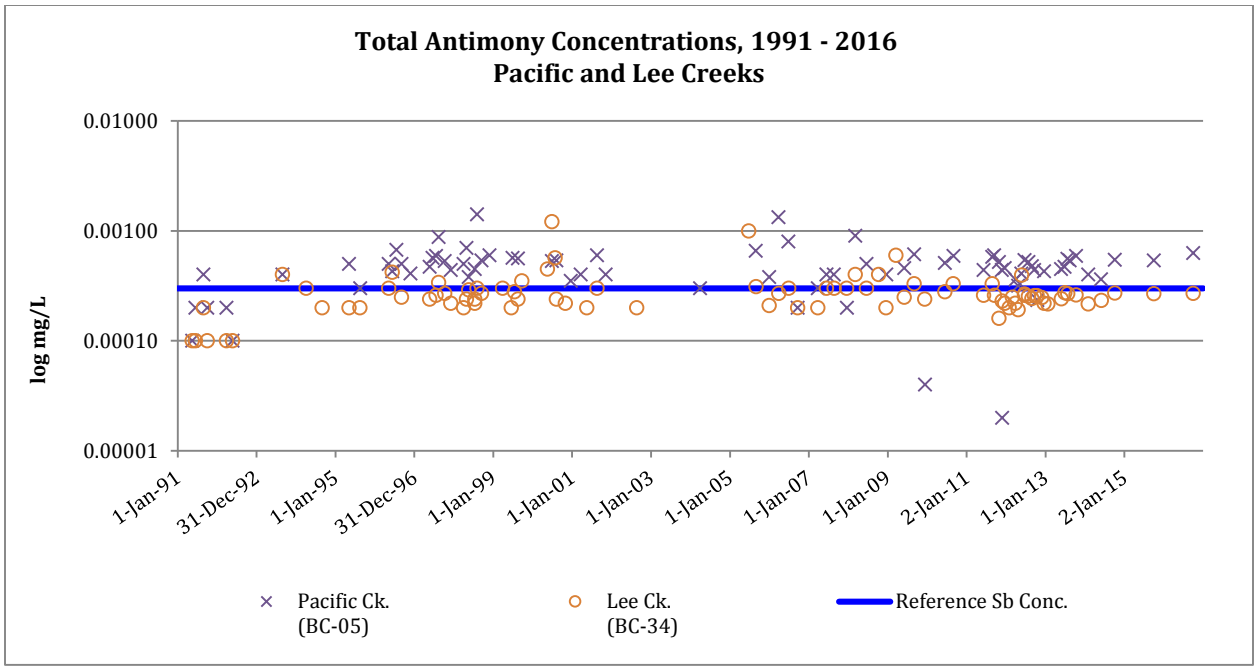


Figure 3-5: Antimony Concentrations on Pacific and Lee Creeks (1991-2016)

3.1.2.3 Arsenic

Arsenic exceeded background in >10% of samples in Pacific Creek during the mining and decommissioning and reclamation phases, and in Lee Creek during the decommissioning phase. It did not exceed reference in Pacific Creek on any occasions prior to mining, as shown on Figure 3-6. None of the results obtained in 2016 exceeded the CCME guideline for arsenic in the downstream receiver on Lee or Pacific Creeks.

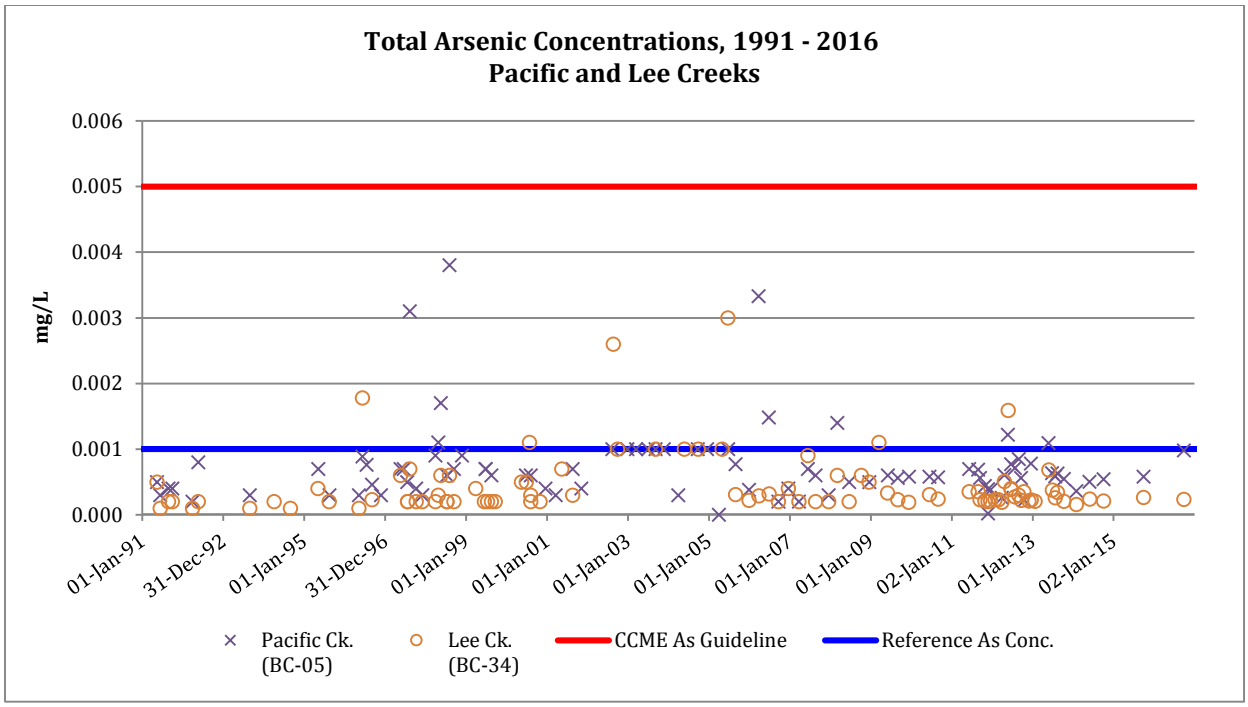


Figure 3-6: Arsenic Concentrations on Pacific and Lee Creeks (1991-2016)

3.1.2.4 Zinc, Copper and Lead

In Lee Creek, it was noted that zinc, copper and lead occasionally exceeded reference conditions (>10% of the time). Zinc and copper (not lead) also occasionally (>10% of the time) exceeded the CCME guideline. However, these elements do not generally pose a threat in Lee Creek, as higher-than-reference concentrations occurred both prior to and after production activities began in 1996.

In Pacific Creek, lead exceeded the reference condition >10% of the time during pre-mining and mining conditions, but not during decommissioning and reclamation. Copper was found to exceed reference >10% of the time only during pre-mining conditions.

The pre-mine variability of zinc, copper and lead in Lee Creek, and of copper and lead in Pacific Creek above the reference condition indicate that these elements do not pose a risk to these watersheds as a result of mining. Moreover, the reference condition for both zinc and lead is below CCME guidelines.[2]

In 2016 copper, lead, and zinc concentrations were all below their respective CCME guidelines, plots detailing trend data as well as 2016 data are provided in Appendix B and Appendix A respectively.

[2] *The CCME guideline for copper and the reference condition are roughly equal.*

3.1.2.5 Nitrate (as Nitrogen)

Nitrate concentrations in Lee and Pacific Creeks were well below the CCME guideline, as shown on Figure 3-7, during pre-mine, mining, and decommissioning and reclamation phases.

In 2004, a fire occurred at the Brewery Creek Mine primarily within the Laura and Carolyn Creek watersheds, but also affected the Lee and Pacific Creek watersheds to a lesser extent. Fire-caused changes in nutrient availability can have enormous effects on the downstream environment; in particular, fires have a great influence on nitrate nitrogen, as the availability of this nutrient increases following forest fires. The post-fire flush of inorganic nitrogen is not solely due to the physical breakdown of plant and animal tissues by fire; it is also a function of the enhanced activity of microbes in the warmer and more alkaline soil of a recently-burned forest.

Nitrate results in Pacific Creek, and to a lesser extent in Lee Creek, showed a minor spike in the years after the fire. Increased nutrient availability may be responsible for the high values observed in Pacific Creek in 2007 and 2008, and may be responsible for the increase in overall concentrations of nitrate on Lee Creek. None of the results obtained in 2016 exceeded the CCME guideline for nitrate in the downstream receiver on Lee Creek or on Pacific Creek.

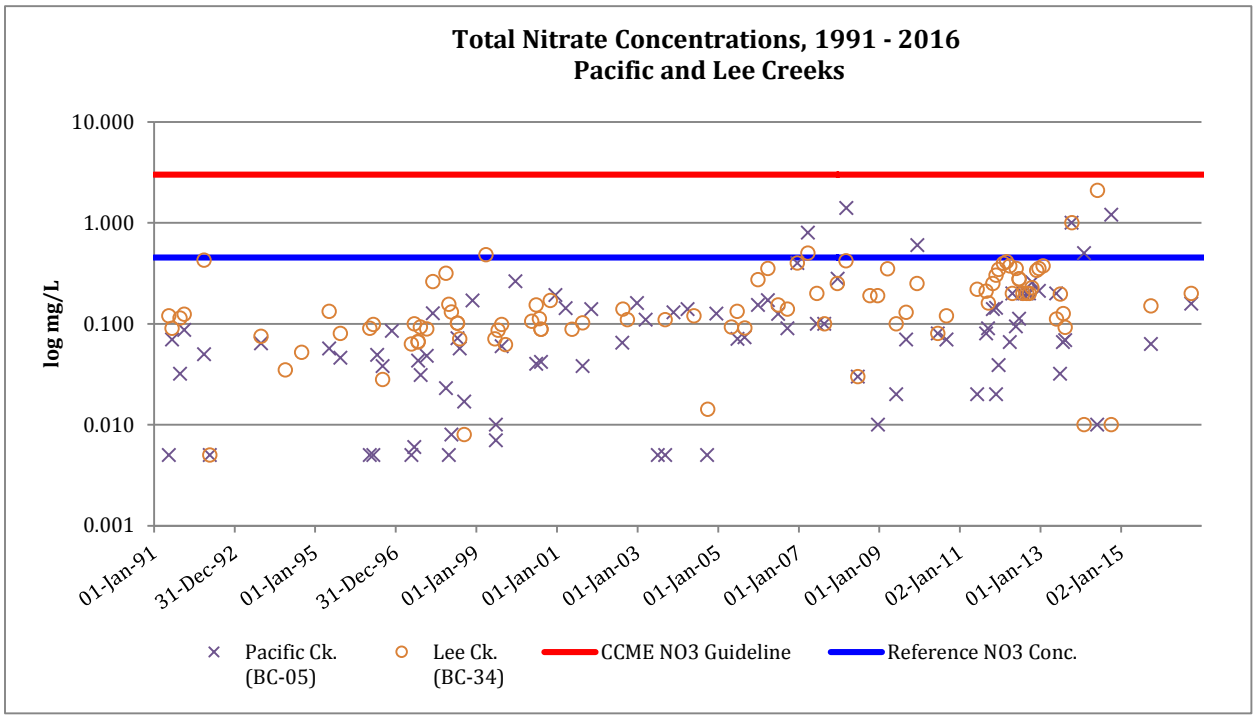


Figure 3-7: Nitrate as Nitrogen Concentrations on Pacific and Lee Creeks (1991-2016)

3.1.2.6 Conditions during Production and Decommissioning and Reclamation

Only one notable increase in metals content was noted in Pacific and Lee Creeks over the course of the mine life. Pacific Creek saw levels of arsenic above reference during mining and decommissioning and reclamation (>10% of samples), indicating that mining may have had an impact on arsenic concentrations. However, all arsenic samples analysed during this period of elevated values were well below the CCME guideline. Pacific Creek saw high levels of antimony (>50% exceeding reference) during all periods, indicating that the reference condition may not appropriately characterize antimony at this station. In Lee Creek, antimony, zinc, copper and lead concentrations were observed to exceed reference >10% of the time in all samples; however, this was found to be true during pre-mining conditions, and was not particular to mining or decommissioning and reclamation. Nitrate nitrogen exhibited values above the reference condition, but not CCME, in the years following the 2004 forest fire at Brewery Creek, indicating that the fire had a measurable effect on this parameter, and could also be influencing the results of other parameters.

The results of this study indicate that none of the parameters investigated in Lee Creek or Pacific Creek occur at concentrations which would lead to a designation as a contaminant of concern. In general, concentrations are below CCME guidelines and in cases where they exceed CCME, such variability is observed even during pre-mining conditions, indicating that mining activities have not had an adverse impact on receiving water quality. Moreover, observed concentrations were not elevated during either mining or decommissioning and reclamation relative to reference concentrations, with the exception of arsenic on Pacific Creek, leading to the conclusion that the impact to the Pacific Creek and Lee Creek receiving environments is negligible even relative to background (which is generally lower than CCME). Only arsenic in Pacific Creek was observed to have increased above reference.

No notable changes in water quality were observed in Pacific and Lee Creeks during 2016. In general, results were below CCME guidelines with the exception of selenium, a parameter that has not been observed at concentrations lower than CCME at any point in the mine's history.

3.1.3 Laura and Carolyn Creeks

Seven stations were established on Laura and Carolyn Creek watersheds, as shown on Table 3-3. Six of these are located on Laura Creek, and one on Carolyn Creek. Monitoring of stations BC-01, BC-02 and BC-03 began in 1991, before the commencement of mining. As a result of impacts observed in the lower portion of Laura Creek during mining and at the start of decommissioning and reclamation, a program was established to assess water quality in the Lower Laura Creek system. This program used additional stations established in the lower portion of the creek, including BC-37, BC-53 and BC-39. Only BC-39 has been analyzed in this assessment as the results of the lower Laura Creek system are presented in the *Impact Study on Lower Laura Creek* (AEG, 2017).

Table 3-3: Water Quality Monitoring Stations on Carolyn and Laura Creeks

Stations on Carolyn Creek and Laura Creek		Included in Assessment
BC-32	Laura Creek below Exploration Camp	No
BC-03	Laura Creek above confluence w/ Carolyn Creek	Yes
BC-01	Laura Creek 50m u/s Ditch Road	Yes
BC-37	Laura Creek @ Ditch Road	No
BC-53	Laura Creek 50m d/s Ditch Road	No
BC-39	Laura Creek in the side channel of South Klondike River	Yes
BC-02	Carolyn Creek before confluence with Laura Creek	Yes

3.1.3.1 Selenium

High MDLs for selenium complicated analysis of results obtained on Laura and Carolyn Creeks (as was the case for Lee and Pacific Creeks), especially prior to mining. However, higher results (>MDL) observed in Carolyn Creek after 2003 allowed analysis of selenium at least on that stream, as shown on Figure 3-8. On Laura Creek however, results were often at or near the detection limit, making interpretation of the results difficult.

Another factor related to the MDL that influenced interpretation of water quality was that the SSWQO established during the previous 1996 water licencing process was only slightly less than four times the typical MDL. A Practical Quantitative Limit (PQL) of five times the MDL is considered prudent in assessing water quality results, although a PQL of three times the MDL is sometimes used.

Carolyn Creek saw the greatest increase in selenium concentrations over the study period, reaching over 0.03 mg/L in August 2004, and nearly as high on several other occasions between 2005 and 2008, at which point concentrations decreased. During the decommissioning and reclamation phase at Brewery Creek, Carolyn Creek exceeded the SSWQO for selenium in 48% of samples, compared with only 6% during mining, and 14% prior to mining.

During the period between 2005 and 2008, upstream concentrations of selenium on Laura Creek were occasionally higher than the SSWQO, reaching 0.006 mg/L on one occasion at BC-01. These results drove values up in the downstream reaches of Laura Creek at BC-39 as well. In June 2007 during the spring freshet, BC-39 reached as high as the site-specific standard of 0.0038 mg/L. These higher concentrations however have abated more recently (since 2008).

Despite an observed increase in selenium concentrations on Laura Creek, results were rarely in excess of the SSWQO, and in no cases exceeded the standard >10% of the time at any station on Laura Creek (BC-01, BC-03 and BC-39). Nonetheless, selenium is regarded as a contaminant of concern within the Carolyn and Laura Creek watershed as a result of the observed high concentrations of selenium in Carolyn Creek relative to background conditions, and the earlier need to establish an SSWQO for this area.

The 2016 results were below the site specific objective. BC-01 and BC-03 were above CCME, but were within the trend that had been observed throughout mine life.

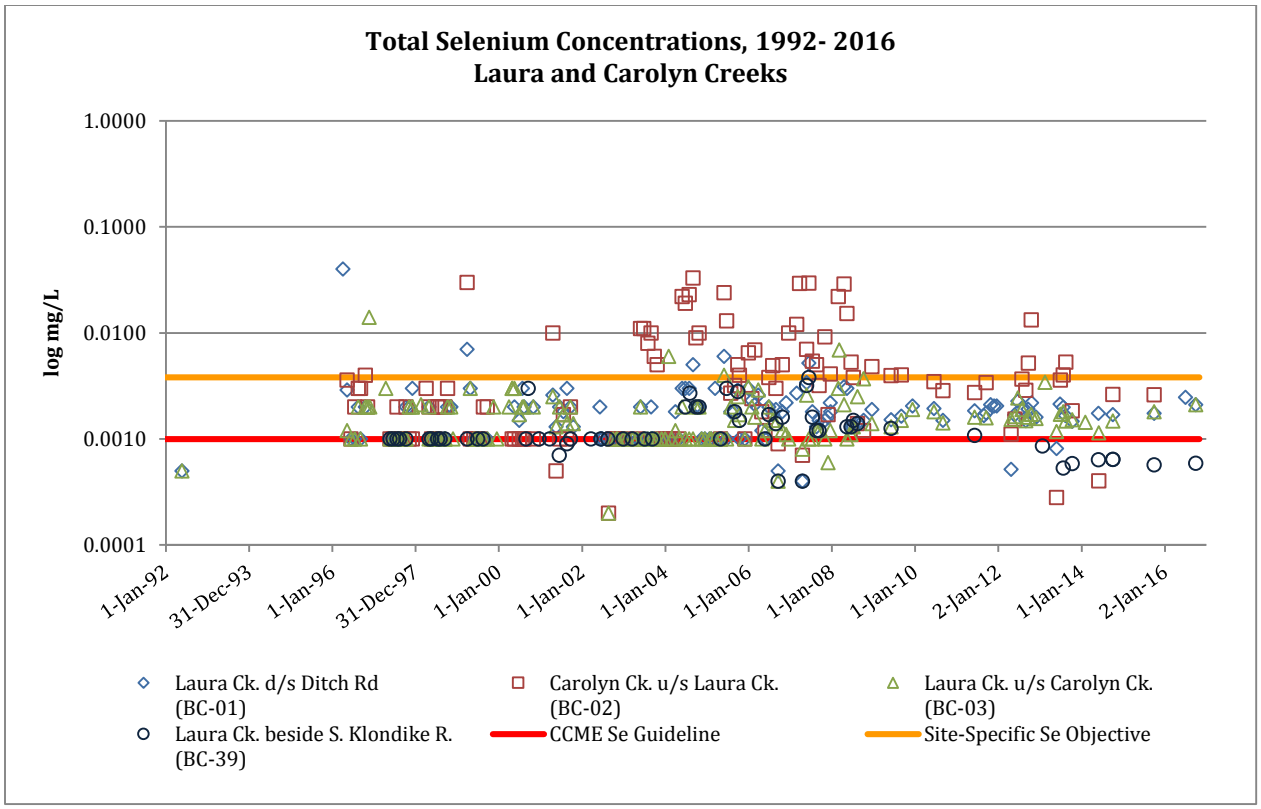


Figure 3-8: Selenium Concentrations on Laura and Carolyn Creeks (1992 – 2016)

3.1.3.2 Arsenic

Arsenic results were not affected by high MDLs. The results show that arsenic concentrations rose in the Laura and Carolyn Creek watersheds primarily after the start of mining; however, the limited background dataset for these sites makes comparison with background benchmarks tenuous[3].

Arsenic concentrations did not show a specific trend for any sites, but all four stations analyzed have exceeded the CCME guideline in the past, as shown on Figure 3-9. At BC-01, arsenic exceeded the CCME guideline in >50% of results during production and decommissioning and reclamation, but only exceeded CCME 20% of the time prior to mining. At BC-02 and BC-03, arsenic was in excess of CCME >10% of the time both during production and decommissioning and reclamation, and exceeded CCME more commonly during mining and reclamation than it did prior to mining. At BC-39, which is a compliance point with respect to CCME guidelines, arsenic exceeded the guideline 5% of the time during mining, and 13% of the time during decommissioning and reclamation.

[3] *A pooled reference dataset may produce a more robust background benchmark for the Laura Creek watershed.*

There were no exceedances of the CCME guideline recorded during the 2016 monitoring events except for BC-01 which follows the trend that had been observed at this site throughout mine life.

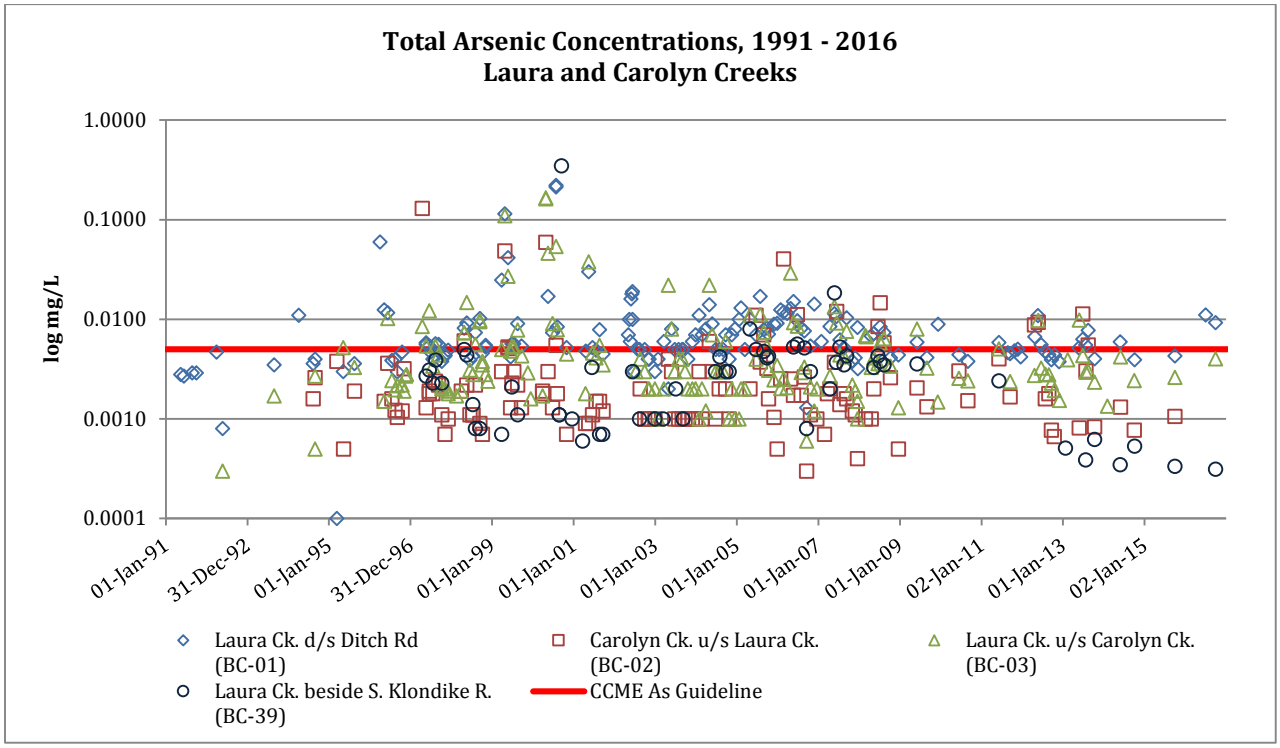


Figure 3-9: Arsenic Concentrations on Laura and Carolyn Creeks (1991 – 2016)

3.1.3.3 Zinc

Like arsenic, the zinc dataset was not impacted by high MDLs. Relative to the arsenic time series for these sites, zinc exceeded CCME with significantly lower frequency. Although zinc values spiked somewhat during production, Figure 3-10 shows a bimodal distribution where zinc again peaks after 2005. The June 2004 fire in the Carolyn and Laura Creek watersheds may have increased the availability of soils containing some zinc for erosion into river waters. In the absence of dissolved zinc concentrations with which to compare the total zinc results, it is difficult to confirm.

Only BC-01 exceeded the CCME guideline in June 2016, which was likely due to increased flow during spring melt. The TSS for this sampling event was exceedingly high (over 7 standard deviations from the mean) which may explain why parameters, such as zinc, were elevated at that time.

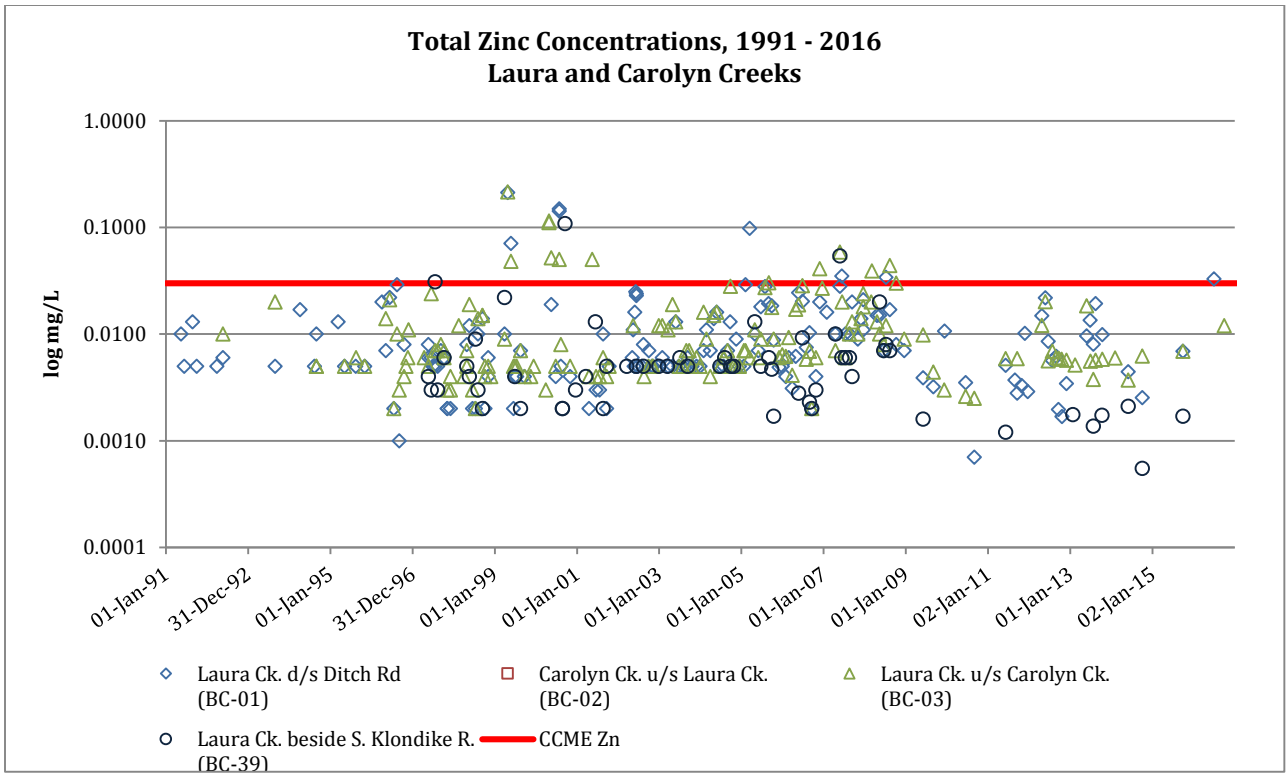


Figure 3-10: Zinc Concentrations on Laura and Carolyn Creeks (1991 – 2016)

3.1.3.4 Copper

Copper results exhibited variation about the CCME guideline, but do not indicate any specific trend, as shown on Figure 3-11. All upstream stations (BC-01, BC-02 and BC-03) show copper results exceeding the CCME guideline >10% of the time during all phases (pre-mine, production, and decommissioning and reclamation).

Results indicate that copper has not become a concern in the Laura Creek watershed as a result of mining. The CCME Copper guideline was exceeded at BC-1 in June and September 2016, but were within the trend that had been observed throughout mine life.

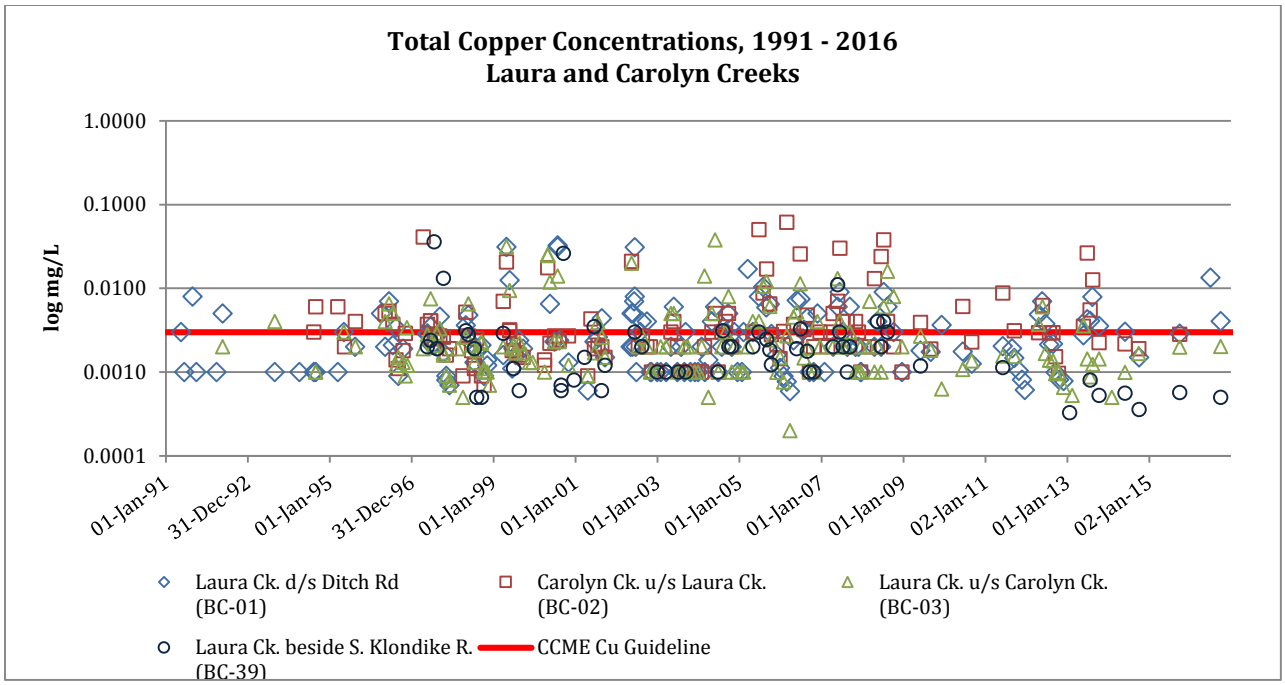


Figure 3-11: Copper Concentrations on Laura and Carolyn Creeks (1991 – 2016)

3.1.3.5 Total Suspended Solids

Total suspended solids (TSS) often exhibits a seasonal pattern during high and low flow periods. On Figure 3-12, all points occurring over the reference TSS value[4] of 33 mg/L occurred during the summer months, especially during May and June, at the spring freshet. The high TSS at BC-01 in June 2016 may explain the occurrence of the high values for copper and zinc

[4] *The reference TSS value for this dataset is a pooled mean calculation of all available data for Laura and Carolyn Creeks.*

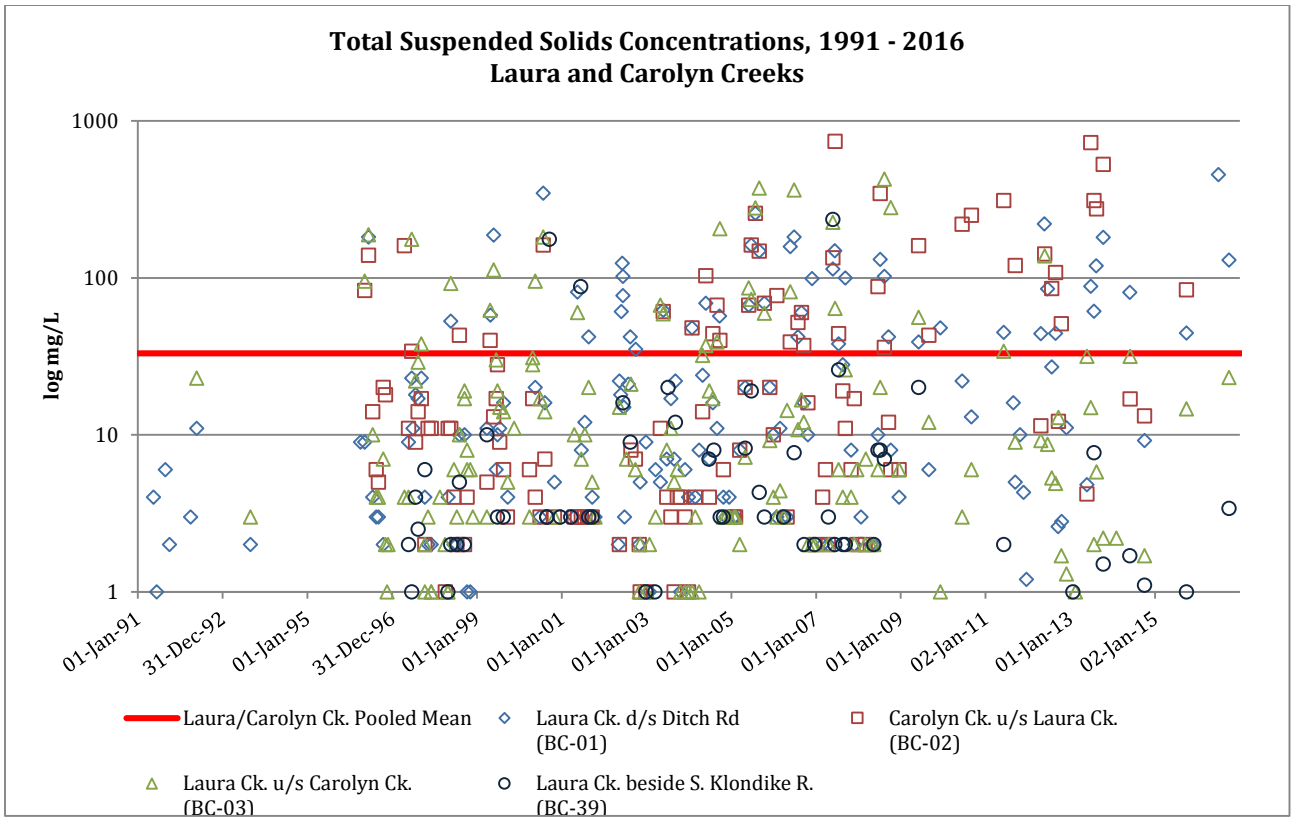


Figure 3-12: Total Suspended Solids Concentrations on Laura and Carolyn Creeks (1991-2016)

3.1.3.6 Nitrate

As mentioned in Section 3.1.2.5, in 2004 a fire occurred at the Brewery Creek Mine within the Laura and Carolyn Creek watersheds which likely had an impact on the amount of nitrate observed here. Perhaps more significant, however, was the release of detoxified heap solution in 2002 and 2003 to the Laura Creek watershed. These releases and later free-draining of the heap would have resulted in an increase in nitrate availability to the Carolyn and Laura Creek systems. Figure 3-13 shows just such an increase in Carolyn Creek, beginning in September 2002.

In 2002, the Laura and Carolyn Creek watersheds also saw the implementation of an evapotranspiration cover over the Blue Waste Rock Storage Area and Heap Leach Pad, as a part of the decommissioning and closure effort. These covers require the application of fertilizers to facilitate plant growth. Fertilizers can have an impact on surface waters as nutrients dissolve into runoff and are carried into the downstream environment, and could be a source of nitrates here.

Nitrate concentrations rose sharply in Laura and Carolyn Creeks in the years following release of detoxified heap solution, implementation of the waste rock and heap leach covers, and the forest fire. Figure 3-13 shows that these watersheds are still absorbing the effects of increased nitrogen inputs, as evidenced by sustained high nitrate concentrations. Samples collected in 2015 and 2016 were below the CCME guideline.

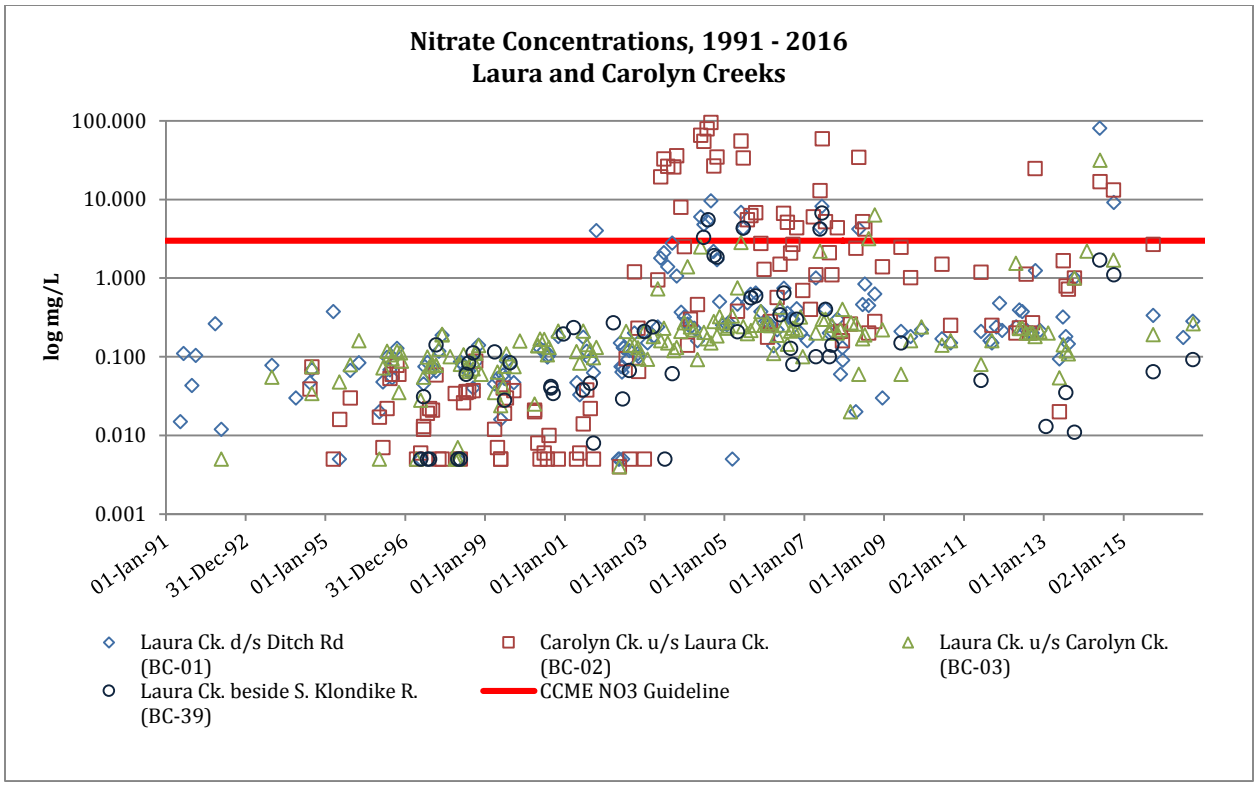


Figure 3-13: Nitrate as Nitrogen Concentrations on Laura and Carolyn Creeks (1991-2016)

3.1.3.7 Conditions during Production and Decommissioning and Reclamation

The mechanisms causing the elevated concentrations with each of these parameters differ in origin and spatial distribution. Arsenic exceeded CCME at all sites and over most phases of mining and decommissioning and reclamation. Copper exceeded the CCME guideline in >10% of samples for all sites and during all periods, but was higher than the CCME guideline prior to the start of mining in 1996. Zinc did not generally pose a significant risk, and elevated values may be associated with environmental conditions caused by the 2004 fire. Nitrate concentrations were also elevated during decommissioning and reclamation as a result of the combined influences of released detoxified heap solution, implementation of the waste rock and heap leach covers, and the 2004 forest fire.

Selenium has an elevated SSWQO to reflect conditions associated with the natural mineralogy of the area and mining activities. Results have consistently met this objective at the compliance station BC-39.

Additional parameters antimony and lead are presented graphically in Appendix B for Laura and Carolyn Creeks.

3.1.4 South Klondike River

3.1.4.1 Observations

Datasets for the South Klondike River were affected by data at or near the MDL, particularly for the early years of monitoring. Data collected from the South Klondike River generally tended to be lower than data collected elsewhere on the property for all parameters. While this drove the issues associated with MDL interference, the fact that so many reportable results occurred below both CCME and reference reduced the concern associated with the data removal. It is likely for values less than problematic MDLs that these results were also below the guidelines, based on the data trends observed in the graphs contained in Appendix B.

No trends indicating increased concentration of parameters of interest have been observed in the South Klondike River as a result of mining activities at the Brewery Creek Mine during 1996 – 2000. Moreover, no appreciable effects have been observed during the significant period of decommissioning and reclamation activities at the mine. Zinc, copper, lead, selenium, arsenic, TSS, and antimony water quality results are presented graphically in Appendix B.

3.2 GROUNDWATER QUALITY

Like surface water monitoring, groundwater monitoring at Brewery Creek has transitioned to the post-closure phase, which involves annual monitoring of groundwater monitoring piezometers at all wells in the license except BC-65 and 66 which are still bi-annual. These events are typically conducted during September or October, during low-flow conditions. The amount of environmental monitoring at BC-19, BC-21, BC-22, BC-65 and BC-66 has reduced in frequency since closure of the heap has been accomplished and the drain down solutions treated. Similarly, since closure of the Blue Waste Rock Storage area has been achieved, monitoring at stations BC-67, BC-68 and BC-69 has been reduced. Piezometers located at stations BC-20, BC-23, BC-24, BC-25 and BC-26 were removed from license QZ96-007 in Amendment #8 and are therefore no longer required to be monitored.

3.2.1 Heap Pad Groundwater Monitoring

Monitoring at stations BC-19, BC-21 and BC-22 showed no sign of increasing or decreasing trends for most metals, total and WAD cyanide, nitrate or ammonia. Antimony levels appear to have decreased slightly in 2012 to 2016. At BC-21, arsenic levels appear to be slightly higher in 2012 to 2016 than the average for the decommissioning and reclamation period, but are not as high as during production. Data are presented graphically in Appendix C. Note that where results were below the MDL, half of the MDL was used in the graphs. Although WAD and total cyanide concentrations appear to be decreasing, this is an artefact of lower MDLs in the recent years.

3.2.2 Land Application Area Groundwater Monitoring

Monitoring at station BC-66 showed no sign of increasing or decreasing trends for most metals, total and WAD cyanide, nitrate or ammonia. All results were in compliance with respect to Clause 43 of Water Licence QZ96-007. BC-65 was dry in 2016 for both sampling events (June and September) and could not be sampled. Data are presented graphically in Appendix C.

3.2.3 Blue WRSA Groundwater Monitoring

Monitoring at stations BC-67and BC-69 showed no sign of increasing or decreasing trends for metals, total and WAD cyanide, nitrate or ammonia. The exception is BC-69 which has a decreasing dissolved selenium over time. Monitoring could not be carried out at Blue WRSA stations BC-68 and BC-70 during 2016. Attempts to sample these locations will continue in future years. Data are presented graphically in Appendix C.

3.3 IN-PIT WATER QUALITY

Mined out pits were used effectively as sediment control basins during operations and mine decommissioning. Snow melt and precipitation run-off is directed to the closest inactive pit. Pit samples are taken from surface standing water within each pit in 2016.

- BC-10: Kokanee Pit and Dump;
- BC-12: Blue Pit;
- BC-15: Moosehead Pit;
- BC-16: Pacific Gulch (typically dry);
- BC-17: Golden Pit and Dump; and
- BC-51W: Pacific Pit (west side).

The following points highlight pit water characteristics:

- Water that is contained in all pits either exfiltrates or evaporates;
- Neither the Pacific nor Blue Pits discharge to surface waters; water infiltrates through the pit bottoms;
- Although the Blue Pit (BC-12) exhibited relatively low pH values in 2012 (4.85 in June), pH values obtained during the 2016 sampling were slightly basic (8.22 in September 2016). These pH values are considerably higher than historic (mining) results in the Blue Pit and suggest pit chemistry is stable and not trending towards any ARD concerns. pH levels in Pacific Pit (BC-51W) have been consistent since 2008; and

- Previous years' sampling in Moosehead (BC-15) showed higher levels of selenium. This trend reversed beginning in 2009, and selenium levels in Moosehead from 2009-2015 continued to be below 0.05 mg/L, with a result of 0.021 mg/L in 2016.

Overall, the results of pit water sampling indicate no upward trends from previous years.

3.4 HEAP EFFLUENT WATER QUALITY

In 2016, no water was discharged into the receiving environment via direct discharge or land application from the over flow pond, heap discharge pond, or the Biological Treatment Cell. The associated samples sites (BC-28, 28a, and 28b) were sampled in September 2016 but were not compared to the effluent quality standards provided in Water License QZ96-007 Clauses 42 and 44 because there was no discharge.

4 SUMMARY

- No contaminants of concern have been identified for Lucky, Golden, Lee and Pacific Creeks.
- Selenium concentrations in Laura and Carolyn Creeks rose several years after land application of the heap effluent. The land application system ceased operations in 2000, while concentrations of selenium in the environment began rising in Carolyn Creek in 2003, and in Laura Creek in 2004 but have been generally lower since 2009.
- The fire had a significant impact on some parameters in Laura and Carolyn Creeks. The fire also had an impact on at least nitrate nitrogen in Lee and Pacific Creeks, as well as slowly impacting the South Yukon River.
- Background concentrations exceeded CCME in some parameters (e.g., BC-34) which supports the need for site specific water quality objectives at some sites, rather than a blanket approach to regulation.
- The South Klondike River achieved CCME or better in 99% of samples collected over all three periods (pre-mining, production and decommissioning). No impacts have been observed in the river as a result of mining activities at the Brewery Creek Mine during 1996 – 2000. Moreover, no effects have been observed during the period of decommissioning and reclamation activities at the mine from 2000 – 2016.

5 REFERENCES

Access Consulting Group, 2010. *Brewery Creek from Assessment and Permitting through Production to Post Closure: A Post Closure Analysis of a Northern Heap Leach Mine*. MPERG Report 2009-4.

Alexco Environmental Group Inc. (AEG), 2017. Lower Laura Creek Impact Study, in *2016 Brewery Creek Annual Report.*

Canadian Council of the Ministers of the Environment, 2012. *Canadian Water Quality Guidelines for the Protection of Aquatic Life*.

Ontario Ministry of Environment and Energy, 1994. *Policies, Guidelines Provincial Water Quality Objective of the Ministry of Environment and Energy (Ontario)*.

APPENDIX A

2016 TABULAR DATA

Station			BC-53	BC-53	BC-51W	BC-39	BC-37	BC-34	BC-34	BC-28a	BC-28a	BC-28a
Station Description		**CCME Guideline**	Lower Laura Creek 50m d/s of Ditch Road	Lower Laura Creek 50m d/s of Ditch Road	Pacific Pit - west side	Laura Creek in side channel of South Klondike R.	Laura Creek at Ditch Road	Lee Creek at Ditch Road	Lee Creek at Ditch Road	Discharge from heap	Discharge from heap	Discharge from heap
Sample Date			6/30/2016	9/28/2016	9/27/2016	9/28/2016	6/30/2016	9/28/2016	9/28/2016	6/29/2016	6/29/2016	9/27/2016
Discharge (Flow)	L/s						388.5		2662			
Staff Gauge Reading / Water Level	m											
pH (field)	pH units	6.5-9	8.02	8.08	3.74	7.13	7.97		8.09		7.43	
pH (lab)	pH units	6.5-9	8.18	8.11	3.63	7.68	8.17	8.13	8.13			
Specific Conductivity (field)	µS/cm		337.9	491.2	647	272.3	338.5		476.3		4170	
Conductivity (lab)	µS/cm		342	514	664	289	343	504	504			
Temperature (field)	C		9.2	0	5.9	3.4	9.2		1.8		4.5	
Hardness (from dissolved)	mg/L		168	256	240	133	165	257	261	1300	1300	1290
Alkalinity, Total	mg/L		98.9	133	<0.50	90.4	101	136	135			
Total Dissolved Solids	mg/L		212	354	464	186	212	334	340			
Total Suspended Solids	mg/L		85.7	33.5	4.8	3.4	104	3	3.2	<1.0	<1.0	<1.0
Chloride	mg/L	120	0.75	1.1	0.81	0.61	0.78	<0.50	0.62			
Sulphate, Dissolved	mg/L		76.9	141	254	64	76.2	134	138			
Ion Balance			0.97	0.94	1.1	0.87	0.94	0.94	0.94			
Ammonia Total	mg/L	0.197	0.016	0.037	0.018	0.0067	0.032	0.0073	0.0076	0.016	0.019	0.024
Nitrate, as N	mg/L	3	0.091	0.268	<0.020	0.092	0.0991	0.2	0.2			
Cyanide, Total	mg/L		0.00062	0.0006	<0.00050	<0.00050	<0.00050	0.00055	0.00054	0.488	0.447	0.462
Cyanide, Weak Acid Dissociable	mg/L	0.005	0.00063	0.00051	0.0006	0.0006	<0.00050	0.00062	0.00055	0.131	0.0377	0.0471
Silver (Ag), Total	mg/L	0.00025	0.000018	<0.000010	0.000014	<0.0000050	0.000022	<0.000010	<0.000010	<0.000025	<0.000025	<0.000025
Aluminum (Al), Total	mg/L	*	1.08	0.367	4.48	0.00194	1.77	0.0293	0.0298	0.0074	0.0062	0.0105
Arsenic (As), Total	mg/L	0.005	0.00482	0.00684	0.0161	0.000314	0.00473	0.000219	0.000236	0.301	0.319	0.335
Barium (Ba), Total	mg/L		0.113	0.0884	0.0443	0.0763	0.123	0.0537	0.0532	0.0423	0.0428	0.0389
Beryllium (Be), Total	mg/L		0.000065	0.000042	0.0107	<0.000010	0.000073	<0.000010	<0.000010	<0.000050	<0.000050	<0.000050
Bismuth (Bi), Total	mg/L		<0.000020	<0.000010	<0.000010	<0.0000050	0.00002	<0.000010	<0.000010	<0.000025	<0.000025	<0.000025
Boron (B), Total	mg/L	1.5	<0.050	<0.010	0.012	<0.010	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050
Calcium (Ca), Total	mg/L		47.2	64.7	53.1	38.2	47.7	67	66.7	400	393	424
Cadmium (Cd), Total	mg/L	*	0.000086	0.000064	0.00395	0.000032	0.000099	0.000102	0.000106	0.000343	0.000331	0.000277
Cobalt (Co), Total	mg/L		0.00127	0.00117	0.0393	0.000035	0.00136	0.000072	0.000071	0.698	0.729	0.678
Chromium (Cr), Total	mg/L	0.001	0.0021	0.00078	0.00098	<0.00010	0.00219	0.00012	0.00013	<0.00050	<0.00050	<0.00050
Copper (Cu), Total	mg/L	*	0.00421	0.00237	0.215	0.000499	0.00474	0.00153	0.00145	0.00137	0.00149	0.00149
Iron (Fe), Total	mg/L	0.3	2.18	0.884	2.84	0.0024	2.21	0.0781	0.0794	0.199	0.224	0.224
Mercury (Hg), Total	mg/L	0.000026	<0.0000020	<0.0000020	0.000007	0.0000022	<0.0000020	0.0000027	0.0000033	0.0000469	0.000047	0.0000385
Potassium (K), Total	mg/L		0.76	1.14	1.64	0.558	0.77	0.66	0.66	5.11	5.22	5.62
Lithium (Li), Total	mg/L		0.00674	0.0113	0.0107	0.00145	0.00711	0.00249	0.00258	0.0052	0.0051	0.0065
Magnesium (Mg), Total	mg/L		14.5	23	26.6	10.4	15	23.5	22.7	73.5	76.1	95.2
Manganese (Mn), Total	mg/L		0.086	0.153	2.03	0.000878	0.0786	0.0161	0.0159	0.0256	0.027	0.0347
Molybdenum (Mo), Total	mg/L	0.073	0.00161	0.00284	<0.000050	0.000616	0.00158	0.00152	0.00148	0.019	0.0196	0.0194
Sodium (Na), Total	mg/L		2.56	3.55	0.79	2.09	2.72	1.34	1.34	435	455	468
Nickel (Ni), Total	mg/L	*	0.00385	0.00451	0.123	0.000448	0.0041	0.00257	0.00253	0.00821	0.0081	0.00911
Lead (Pb), Total	mg/L	*	0.00121	0.000477	0.000157	<0.0000050	0.00136	0.00004	0.000034	<0.000025	<0.000025	<0.000025
Phosphorous (p), Total	mg/L		0.064	0.0301	0.0182	<0.0020	0.072	0.0098	0.0104	0.058	0.053	0.035
Antimony (Sb), Total	mg/L		0.00143	0.00285	0.00289	0.000249	0.00155	0.000263	0.00027	1.87	1.9	1.98
Selenium (Se), Total	mg/L	0.001	0.00116	0.00206	0.00508	0.000591	0.0012	0.00219	0.00218	0.189	0.196	0.194
Tin (Sn), Total	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0010	<0.0010	<0.0010
Strontium (Sr), Total	mg/L		0.243	0.31	0.388	0.23	0.25	0.286	0.274	1.77	1.86	2.05
Sulphur (S), Total	mg/L		24	41.6	94.2	20.1	25	41.7	40.5	287	301	359
Tellurium, total	mg/L											
Thorium, total	mg/L											
Titanium (Ti), Total	mg/L		0.0437	0.0138	<0.0020	<0.00050	0.0415	<0.0020	<0.0020	<0.0025	<0.0025	<0.0025
Uranium (U), Total	mg/L	0.015	0.00153	0.00253	0.00376	0.000756	0.00159	0.0017	0.00167	0.0234	0.0237	0.0338
Vanadium (V), Total	mg/L		0.00449	0.00225	<0.00020	<0.00020	0.00461	0.00092	0.00089	<0.0010	<0.0010	<0.0010
Zinc (Zn), Total	mg/L	0.03	0.0096	0.0068	0.34	0.00167	0.0105	0.0105	0.0107	0.0106	0.0104	0.00956
Zirconium (Zr), Total	mg/L		0.00024	0.00022	<0.00010	<0.00010	0.00022	<0.00010	<0.00010	<0.00050	<0.00050	<0.00050
Silicon (Si), Total	mg/L		5.54	5.84	10.3	2.97	5.64	3.45	3.39	4.56	4.73	4.81

CCME Guideline for Aquatic life (first column): Results or detection limits above the CCME guideline are flagged in red
The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

Station			BC-28a	BC-17	BC-15	BC-12	BC-10	BC-6	BC-4	BC-31	BC-5
Station Description		**CCME Guideline**	Discharge from heap	Golden Pit and Dump	Moosehead Pit discharge	Blue Pit	Kokanee Pit and Dump	South Klondike R. d/s from confluence w/ Lee Creek	Lucky Creek d/s of Lucky Pit	Golden Creek above confluence w/ South Klondike R.	Pacific Creek u/s from confluence w/ Lee Creek
Sample Date			9/27/2016	9/29/2016	9/29/2016	9/29/2016	9/29/2016	9/28/2016	9/28/2016	9/28/2016	9/28/2016
Discharge (Flow)	L/s								38.1	856.2	171.9
Staff Gauge Reading / Water Level	m									0.632	0.273
pH (field)	pH units	6.5-9	7.46	7.71	8.11	7.7	8.22	7.12	7.75	8.2	8.01
pH (lab)	pH units	6.5-9		8.04	8.12	7.98	8.16	7.96	8.04	8.17	8.09
Specific Conductivity (field)	µS/cm		4050	329.9	995	867	462	296	611.7	534.9	518.4
Conductivity (lab)	µS/cm			353	1060	744	498	311	650	565	545
Temperature (field)	C		4	2.5	3.7	6.2	4.9	2.2	1.3	0.3	0.2
Hardness (from dissolved)	mg/L		1330	174	597	388	252	152	335	296	279
Alkalinity, Total	mg/L			118	147	212	140	87.8	152	161	138
Total Dissolved Solids	mg/L			248	834	500	318	204	480	388	392
Total Suspended Solids	mg/L		1.1	<1.0	1.5	1.2	1.4	2.2	6.9	16.3	11.1
Chloride	mg/L	120						0.5	0.63	0.59	0.95
Sulphate, Dissolved	mg/L			59	472	188	124	73.7	190	145	156
Ion Balance								0.95	0.97	0.96	0.94
Ammonia Total	mg/L	0.197	0.015	0.0052	0.012	0.049	<0.0050	0.01	0.05	0.019	0.065
Nitrate, as N	mg/L	3		1.59	0.058	0.032	<0.020	0.106	0.242	0.261	0.158
Cyanide, Total	mg/L		0.464					<0.00050		0.00057	
Cyanide, Weak Acid Dissociable	mg/L	0.005	0.051					<0.00050		<0.00050	
Silver (Ag), Total	mg/L	0.00025	<0.000025	<0.0000050	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000010	<0.000010
Aluminum (Al), Total	mg/L	*	0.0121	0.00179	0.0074	0.024	0.0167	0.0206	0.0584	0.177	0.136
Arsenic (As), Total	mg/L	0.005	0.317	0.0406	0.0501	0.155	0.0157	0.000651	0.0039	0.000692	0.000981
Barium (Ba), Total	mg/L		0.0365	0.117	0.0526	0.0294	0.133	0.0569	0.0729	0.0986	0.0988
Beryllium (Be), Total	mg/L		<0.000050	<0.000010	<0.000010	0.000103	<0.000010	<0.000010	<0.000010	0.000015	0.000015
Bismuth (Bi), Total	mg/L		<0.000025	<0.0000050	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000010	<0.000010
Boron (B), Total	mg/L	1.5	<0.050	<0.010	<0.010	0.023	<0.010	<0.010	<0.010	0.011	<0.010
Calcium (Ca), Total	mg/L		394	50.8	137	120	64.2	41.7	83.4	72.5	68.4
Cadmium (Cd), Total	mg/L	*	0.000272	0.000024	0.000023	0.000237	0.000028	0.000038	0.000168	0.000093	0.000117
Cobalt (Co), Total	mg/L		0.63	0.000006	0.000036	0.00401	0.000047	0.000058	0.000428	0.000238	0.000399
Chromium (Cr), Total	mg/L	0.001	<0.00050	0.00019	<0.00010	<0.00010	<0.00010	<0.00010	0.0002	0.00032	0.00052
Copper (Cu), Total	mg/L	*	0.00152	0.000129	0.00046	0.000678	0.000377	0.000631	0.000675	0.00199	0.00281
Iron (Fe), Total	mg/L	0.3	0.213	0.0019	0.0142	0.347	0.0251	0.0529	0.359	0.363	0.389
Mercury (Hg), Total	mg/L	0.000026	0.0000386	<0.0000020	0.0000035	<0.0000020	0.0000034	<0.0000020	<0.0000020	<0.0000020	0.0000026
Potassium (K), Total	mg/L		5.2	0.73	0.97	1.87	1.44	0.463	1.26	0.89	1.03
Lithium (Li), Total	mg/L		0.0051	0.00236	0.0018	0.00746	0.00374	0.00226	0.00879	0.00717	0.00444
Magnesium (Mg), Total	mg/L		88.1	13.4	62.3	35.4	24.4	11.8	32.6	28.1	36.1
Manganese (Mn), Total	mg/L		0.0406	0.000443	0.00736	0.288	0.0111	0.0106	0.122	0.0473	0.102
Molybdenum (Mo), Total	mg/L	0.073	0.0183	0.00918	0.00102	0.0085	0.00414	0.000549	0.00244	0.00211	0.00299
Sodium (Na), Total	mg/L		423	1.1	0.47	0.899	0.778	1.94	1.83	1.9	2.6
Nickel (Ni), Total	mg/L	*	0.00851	0.00162	0.00062	0.0201	0.000483	0.000994	0.0035	0.00281	0.00662
Lead (Pb), Total	mg/L	*	<0.000025	<0.0000050	0.00005	0.000017	0.000046	0.000044	0.0001	0.000239	0.000145
Phosphorous (p), Total	mg/L		0.046	0.0104	0.0068	0.0025	0.0077	<0.0020	0.011	0.0182	0.0261
Antimony (Sb), Total	mg/L		1.87	0.138	0.00455	0.146	0.105	0.000173	0.00337	0.000758	0.000625
Selenium (Se), Total	mg/L	0.001	0.181	0.00938	0.0207	0.000487	0.00563	0.000715	0.00449	0.00212	0.00173
Tin (Sn), Total	mg/L		<0.0010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Strontium (Sr), Total	mg/L		1.97	0.272	1.37	0.709	0.525	0.252	0.518	0.367	0.419
Sulphur (S), Total	mg/L		337	18.2	150	77	39.5	22.9	62	43.6	66.8
Tellurium, total	mg/L										
Thorium, total	mg/L										
Titanium (Ti), Total	mg/L		<0.0025	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	0.0022	0.0044	0.0059
Uranium (U), Total	mg/L	0.015	0.0318	0.00599	0.00491	0.00841	0.0103	0.000833	0.00339	0.00386	0.00202
Vanadium (V), Total	mg/L		<0.0010	<0.00020	<0.00020	<0.00020	0.00021	0.00026	0.00135	0.00131	0.00224
Zinc (Zn), Total	mg/L	0.03	0.00912	0.0121	0.001	0.026	0.00055	0.00279	0.00906	0.0079	0.0249
Zirconium (Zr), Total	mg/L		<0.00050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	0.00017	0.00028
Silicon (Si), Total	mg/L		4.44	3.9	2.25	4.68	1.67	2.75	3.56	4.1	4.42

CCME Guideline for Aquatic life (first column): Results or detection limits above the CCME guideline are flagged in red
The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

Station			**BC-3**	**BC-1**	**BC-1**
Station Description		**CCME Guideline**	Laura Creek, above confluence w/ Carolyn Creek	Laura Creek, 50m u/s from Ditch Road	Laura Creek, 50m u/s from Ditch Road
Sample Date			9/29/2016	6/30/2016	9/28/2016
Discharge (Flow)	L/s		114.8	143.6	159.1
Staff Gauge Reading / Water Level	m			0.6	0.399
pH (field)	pH units	6.5-9	8.05	7.97	8.09
pH (lab)	pH units	6.5-9	8.1	8.22	8.09
Specific Conductivity (field)	µS/cm		524.9	495.6	487.5
Conductivity (lab)	µS/cm		555	503	511
Temperature (field)	C		1.2	4.5	0
Hardness (from dissolved)	mg/L		280	252	270
Alkalinity, Total	mg/L		136	142	132
Total Dissolved Solids	mg/L		386	328	352
Total Suspended Solids	mg/L		23.2	454	130
Chloride	mg/L	120	1	1	1.2
Sulphate, Dissolved	mg/L		161	123	143
Ion Balance			0.95	0.97	0.99
Ammonia Total	mg/L	0.197	0.023	0.047	0.033
Nitrate, as N	mg/L	3	0.264	0.176	0.284
Cyanide, Total	mg/L			<0.00050	0.00056
Cyanide, Weak Acid Dissociable	mg/L	0.005		<0.00050	<0.00050
Silver (Ag), Total	mg/L	0.00025	<0.000010	0.000069	0.00001
Aluminum (Al), Total	mg/L	*	0.236	3.79	1
Arsenic (As), Total	mg/L	0.005	0.00403	0.0111	0.00928
Barium (Ba), Total	mg/L		0.0821	0.266	0.117
Beryllium (Be), Total	mg/L		0.000051	0.000219	0.000064
Bismuth (Bi), Total	mg/L		<0.000010	0.000064	0.000014
Boron (B), Total	mg/L	1.5	<0.010	<0.050	<0.010
Calcium (Ca), Total	mg/L		70.3	70.7	64.4
Cadmium (Cd), Total	mg/L	*	0.000122	0.000271	0.000116
Cobalt (Co), Total	mg/L		0.00184	0.00422	0.00176
Chromium (Cr), Total	mg/L	0.001	0.00051	0.00712	0.00186
Copper (Cu), Total	mg/L	*	0.00203	0.0134	0.00404
Iron (Fe), Total	mg/L	0.3	0.649	7.1	1.99
Mercury (Hg), Total	mg/L	0.000026	0.0000029	<0.0000020	<0.0000020
Potassium (K), Total	mg/L		1.29	1.39	1.2
Lithium (Li), Total	mg/L		0.0128	0.0158	0.0118
Magnesium (Mg), Total	mg/L		25.7	25	23
Manganese (Mn), Total	mg/L		0.165	0.223	0.19
Molybdenum (Mo), Total	mg/L	0.073	0.00245	0.00265	0.00299
Sodium (Na), Total	mg/L		3.11	3.84	3.74
Nickel (Ni), Total	mg/L	*	0.00736	0.0122	0.00633
Lead (Pb), Total	mg/L	*	0.000269	0.00428	0.00111
Phosphorous (p), Total	mg/L		0.0225	0.281	0.0763
Antimony (Sb), Total	mg/L		0.00382	0.0031	0.00286
Selenium (Se), Total	mg/L	0.001	0.00211	0.00247	0.00211
Tin (Sn), Total	mg/L		<0.00020	<0.00020	<0.00020
Strontium (Sr), Total	mg/L		0.356	0.347	0.315
Sulphur (S), Total	mg/L		48.8	42	41.5
Tellurium, total	mg/L				
Thorium, total	mg/L				
Titanium (Ti), Total	mg/L		0.0083	0.104	0.0365
Uranium (U), Total	mg/L	0.015	0.00228	0.00304	0.00269
Vanadium (V), Total	mg/L		0.00129	0.0139	0.00437
Zinc (Zn), Total	mg/L	0.03	0.012	0.033	0.0121
Zirconium (Zr), Total	mg/L		0.00014	0.00066	0.0003
Silicon (Si), Total	mg/L		5.01	10.9	6.84

CCME Guideline for Aquatic life (first column): Results or detection limits above the CCME guideline are flagged in red
The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

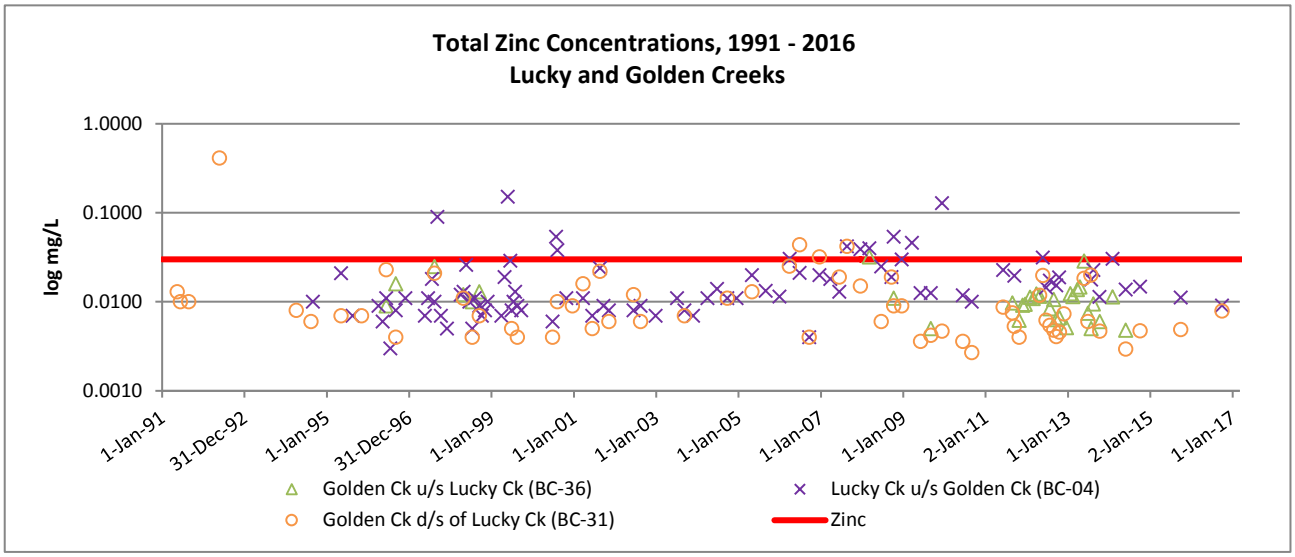
Golden Predator Exploration Ltd.
Feburary 2016

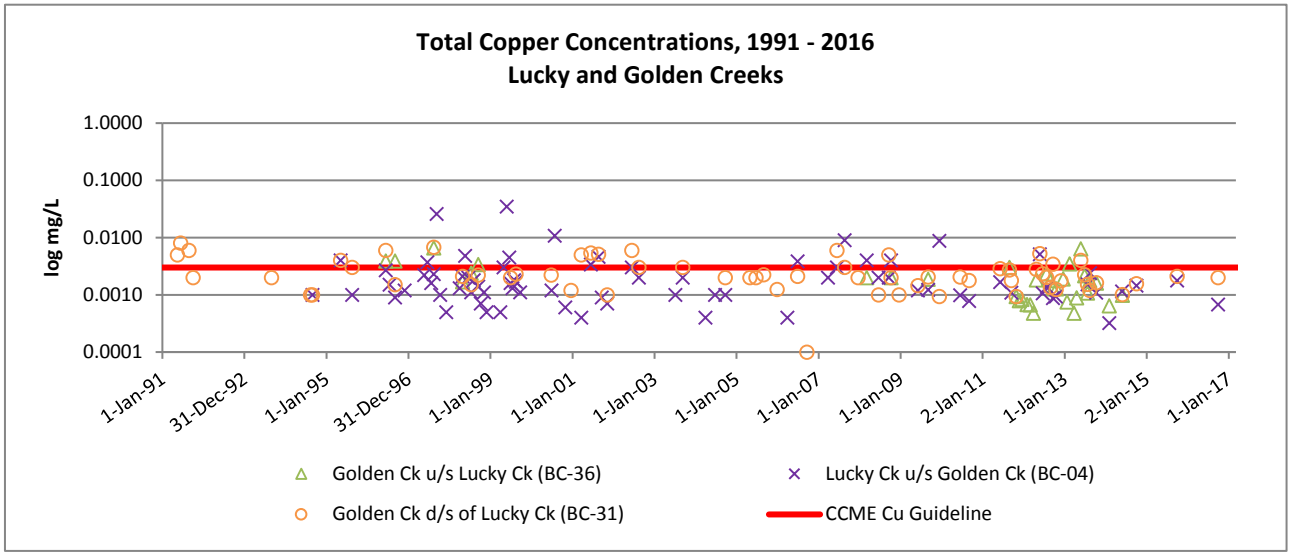
Brewery Creek Mine
Water Quality Assessment

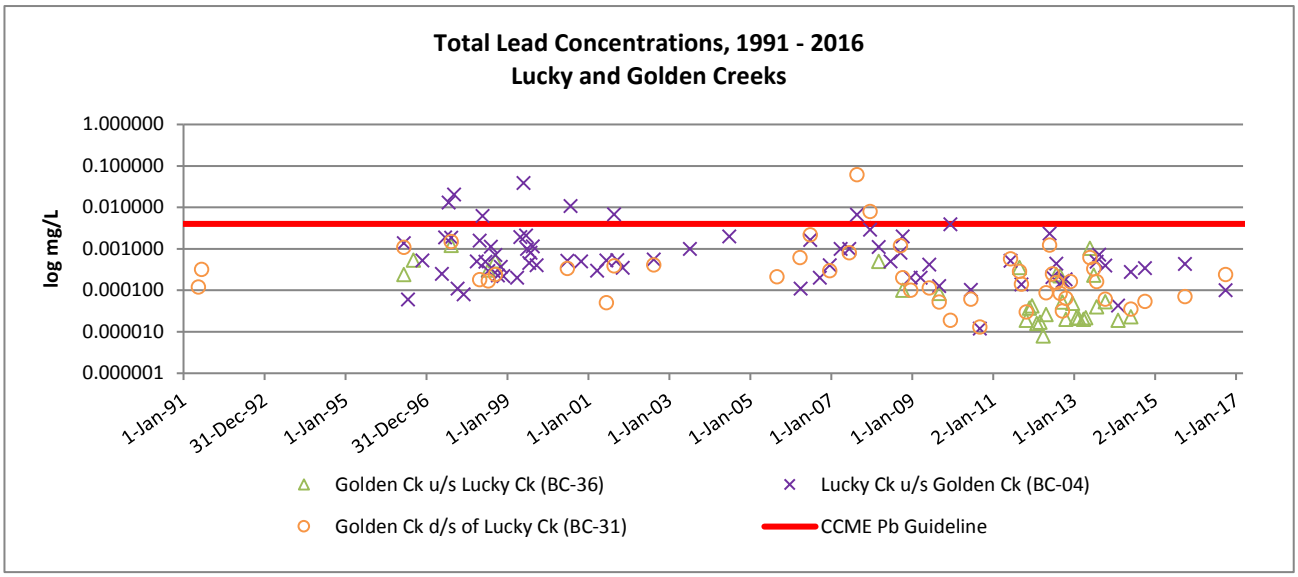
Station		**BC-69**	**BC-67**	**BC-66**	**BC-66**	**BC-27**	**BC-22**	**BC-21**	**BC-19**
Description		Blue WRSA Piezometer (Deep Well)	Blue WRSA Piezometer	Land Application Piezometer (Deep Well)	Land Application Piezometer (Deep Well)	Piezometer RC97-2026	Piezometer RC95-1357	Piezometer RC95-1354	Piezometer RC94-843
Sample Date		9/29/2016	9/29/2016	6/29/2016	9/27/2016	9/29/2016	9/27/2016	9/27/2016	9/27/2016
pH (field)	pH units	6.98	6.79	7.23	7.28	7.21	5.36	6.7	6.46
pH (lab)	pH units	7.79	7.4	8.03	8.03	7.8	5.89	7.38	7.2
Specific Conductivity (field)	µS/cm	800	481	751	709.7	822	1450	1176	1184
Conductivity (lab)	µS/cm	873	503	760	757	861	1510	1260	1250
Temperature (field)	C	4.7	5.5	5.5	3.7	4.2	2.4	3.3	2.3
Hardness (from dissolved)	mg/L	457	257	364	349	466	828	700	701
Alkalinity, Total	mg/L	350	209	242	236	169	64.2	270	283
Total Dissolved Solids	mg/L	504	290		436	624	1320	916	928
Total Suspended Solids	mg/L			7					
Chloride	mg/L	2.7	1.9	5.5	5.5	0.97	0.98	3.4	1.3
Sulphate, Dissolved	mg/L	151	55.8	22.3	25	297	901	474	458
Ion Balance	N/A	0.92	0.98	1	0.97	0.98	0.86	0.95	0.96
Ammonia Total	mg/L	0.02	0.028	0.022	<0.0050	0.055	0.027	0.17	0.018
Nitrate, as N	mg/L	0.028	<0.020	32.9	32.7	<0.020	1.87	<0.020	0.451
Cyanide, Total	mg/L	<0.00050	<0.00050	0.00668	0.00589	<0.00050	<0.00050	<0.00050	<0.00050
Cyanide, Weak Acid Dissociable	mg/L	<0.00050	<0.00050	0.00416	0.00373	<0.00050	<0.00050	<0.00050	<0.00050
Aluminum (Al), Dissolved	mg/L	0.00083	<0.00050	0.00109	<0.00050	<0.00050	0.515	<0.00050	0.0012
Antimony (Sb), Dissolved	mg/L	0.00515	0.0982	0.00014	0.000136	0.00199	0.000024	0.000168	0.000179
Arsenic (As), Dissolved	mg/L	0.0404	0.00403	0.000131	0.000206	0.0616	0.000135	0.011	0.000408
Barium (Ba), Dissolved	mg/L	0.0248	0.113	0.0492	0.049	0.0105	0.00941	0.0233	0.00342
Beryllium (Be), Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000223	<0.000010	<0.000010
Bismuth (Bi), Dissolved	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B), Dissolved	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.038	0.032	0.019
Cadmium (Cd), Dissolved	mg/L	0.000968	0.000191	0.000017	0.000059	0.000048	0.0127	0.000042	0.00093
Calcium (Ca), Dissolved	mg/L	92.9	65.6	75.1	72.4	117	219	151	159
Copper (Cu), Dissolved	mg/L	0.000172	0.00024	0.000501	0.000317	<0.000050	0.00095	0.00045	0.000299
Iron (Fe), Dissolved	mg/L	<0.0010	<0.0010	0.0017	<0.0010	0.005	0.165	0.002	0.0013
Lead (Pb), Dissolved	mg/L	0.000007	<0.0000050	0.000008	0.000009	<0.0000050	0.000023	<0.0000050	0.000015
Lithium (Li), Dissolved	mg/L	0.00787	0.00654	0.0195	0.0193	0.0101	0.0744	0.041	0.0336
Magnesium (Mg), Dissolved	mg/L	54.7	22.7	42.9	41	42.2	68.3	78.3	73.6
Manganese (Mn), Dissolved	mg/L	0.271	0.411	0.000152	0.000174	0.223	0.806	2.18	0.468
Mercury (Hg), Dissolved	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Molybdenum (Mo), Dissolved	mg/L	0.000309	0.000587	0.000137	0.000179	0.0117	0.000372	0.000395	<0.000050
Nickel (Ni), Dissolved	mg/L	0.00315	0.023	0.000207	0.000428	0.00218	0.143	0.00528	0.00318
Phosphorous (P), Dissolved	mg/L	0.0054	0.0141	0.0068	0.0045	<0.0020	0.0168	<0.0020	0.0207
Potassium (K), Dissolved	mg/L	5.68	1.75	2.37	2.37	1.38	4.39	3.76	2.63
Selenium (Se), Dissolved	mg/L	0.000883	0.000056	0.0144	0.0148	<0.000040	0.0462	0.000339	0.00593
Silicon (Si), Dissolved	mg/L	2.9	4.22	4.69	4.38	3.61	14.6	5.55	6.72
Silver (Ag), Dissolved	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na), Dissolved	mg/L	2.74	1.81	10.7	10.2	1.59	13.3	8.36	11.1
Strontium (Sr), Dissolved	mg/L	0.501	0.325	0.391	0.385	0.803	0.411	0.551	0.579
Sulphur (S), Dissolved	mg/L	39.5	15.7	7.7	7.2	89.4	244	134	140
Tellurium, dissolved	mg/L								
Thallium (Tl), Dissolved	mg/L	0.000204	0.00007	0.000008	0.000007	0.000003	0.000072	0.000018	0.000016
Thorium, dissolved	mg/L								
Tin (Sn), Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium (Ti), Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U), Dissolved	mg/L	0.00446	0.00808	0.000927	0.000976	0.0127	0.000066	0.00277	0.00103
Vanadium (V), Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Zinc (Zn), Dissolved	mg/L	0.11	0.0972	0.00285	0.00246	0.0228	0.299	0.0888	0.0311
Zirconium (Zr), Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

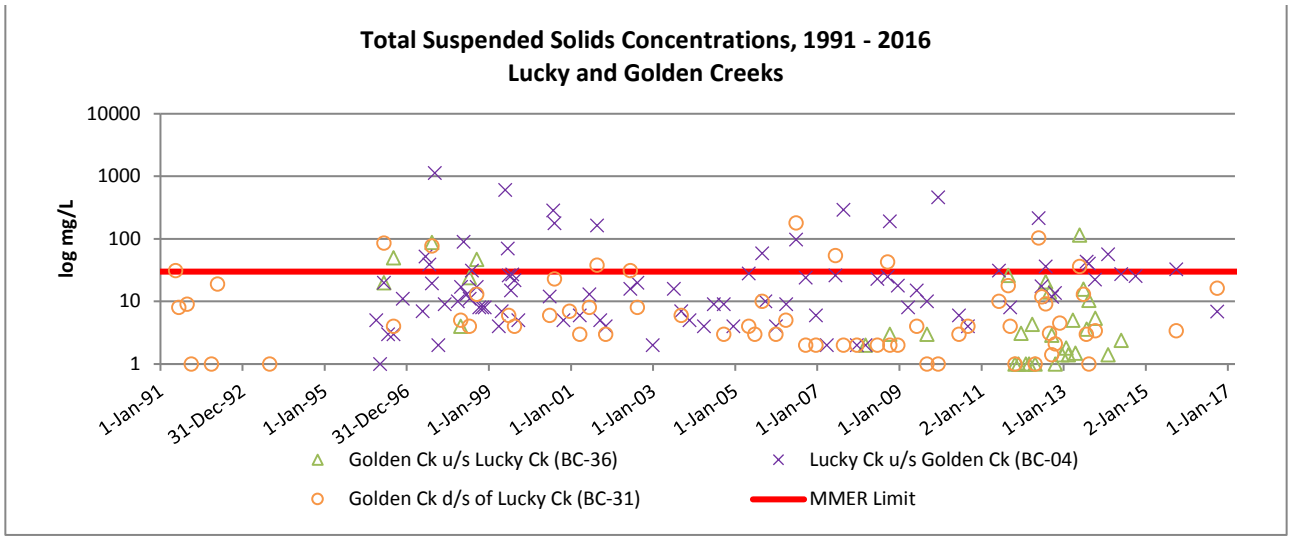
APPENDIX B

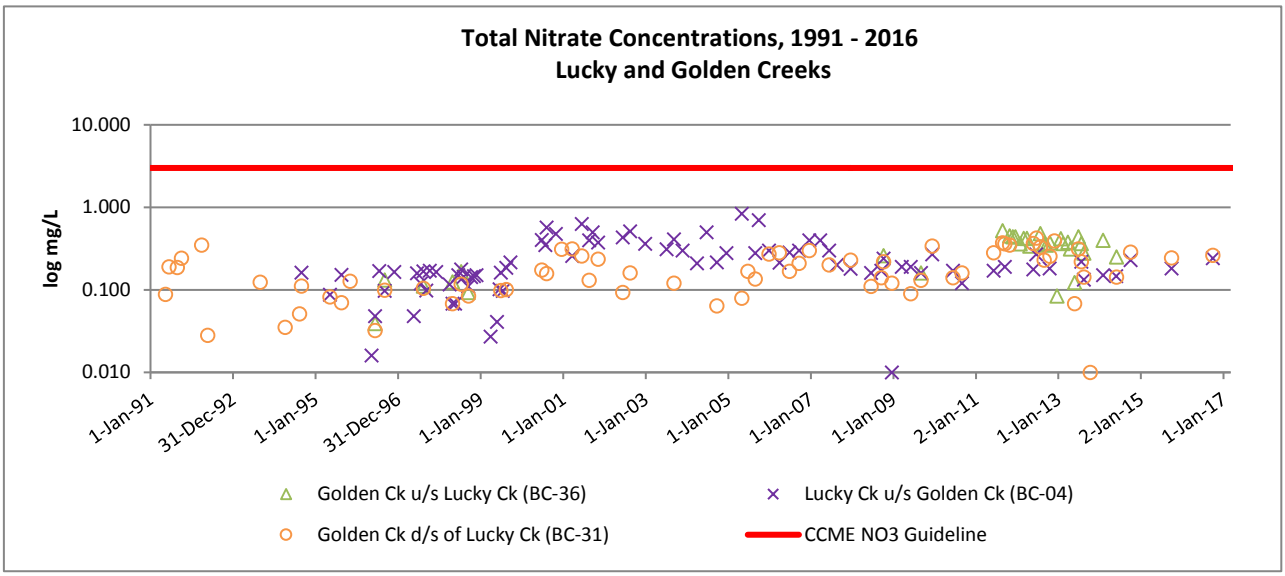
SURFACE WATER GRAPHICAL DATA

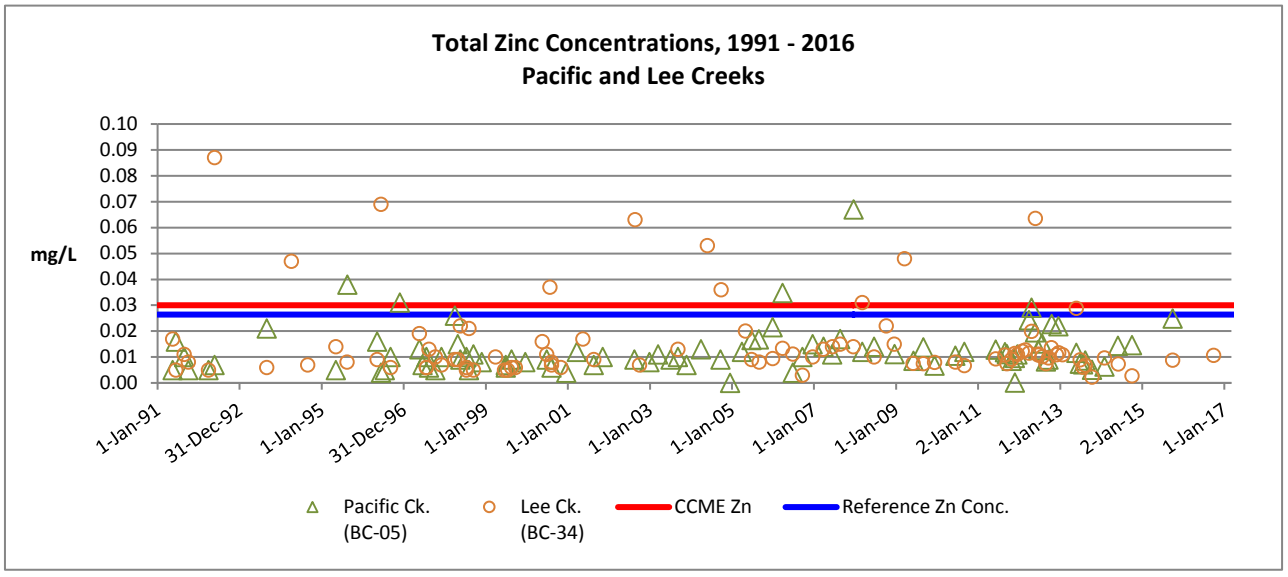

Total Zinc Concentrations, 1991 - 2016
Lucky and Golden Creeks
log mg/L
1.0000
0.1000
0.0100
0.0010
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
Zinc

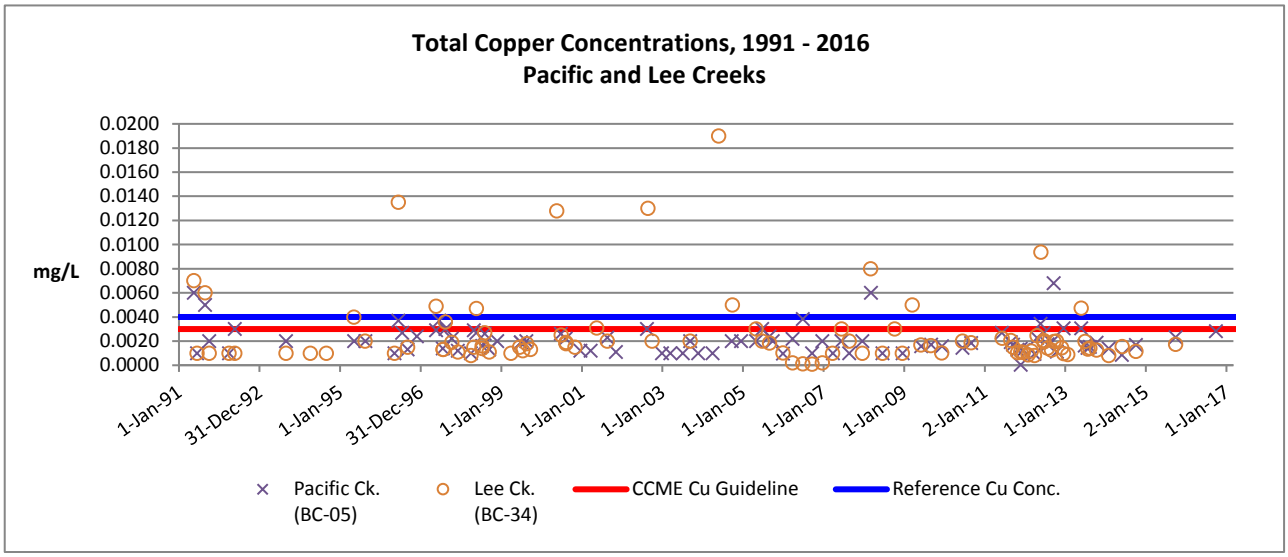

Total Copper Concentrations, 1991 - 2016
Lucky and Golden Creeks
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
CCME Cu Guideline

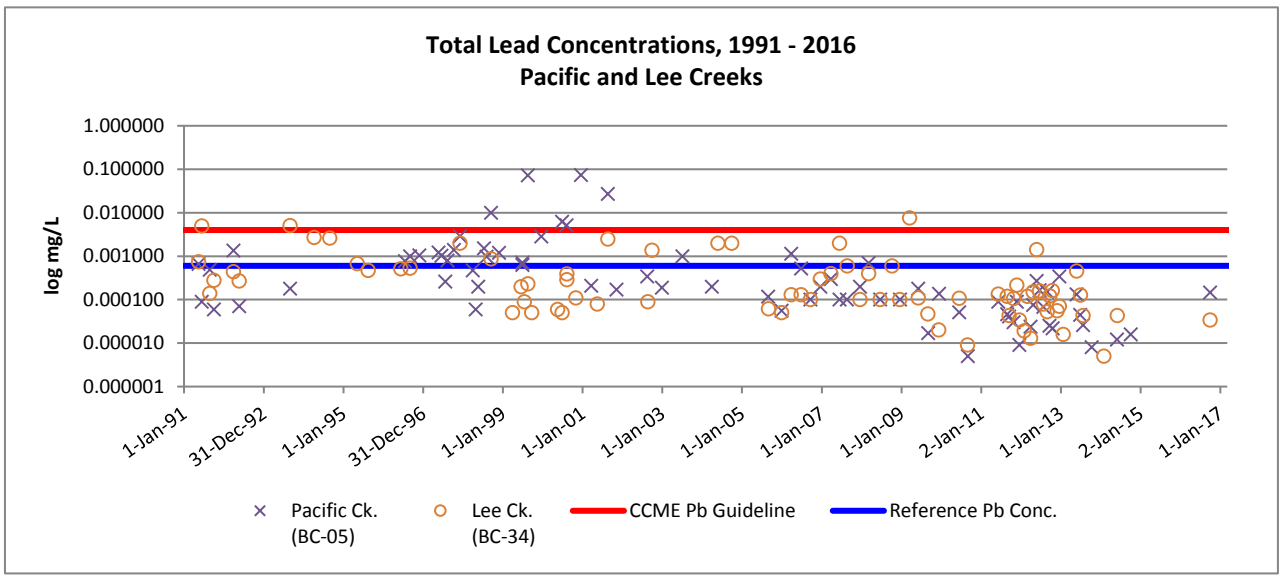

Total Lead Concentrations, 1991 - 2016
Lucky and Golden Creeks
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
CCME Pb Guideline

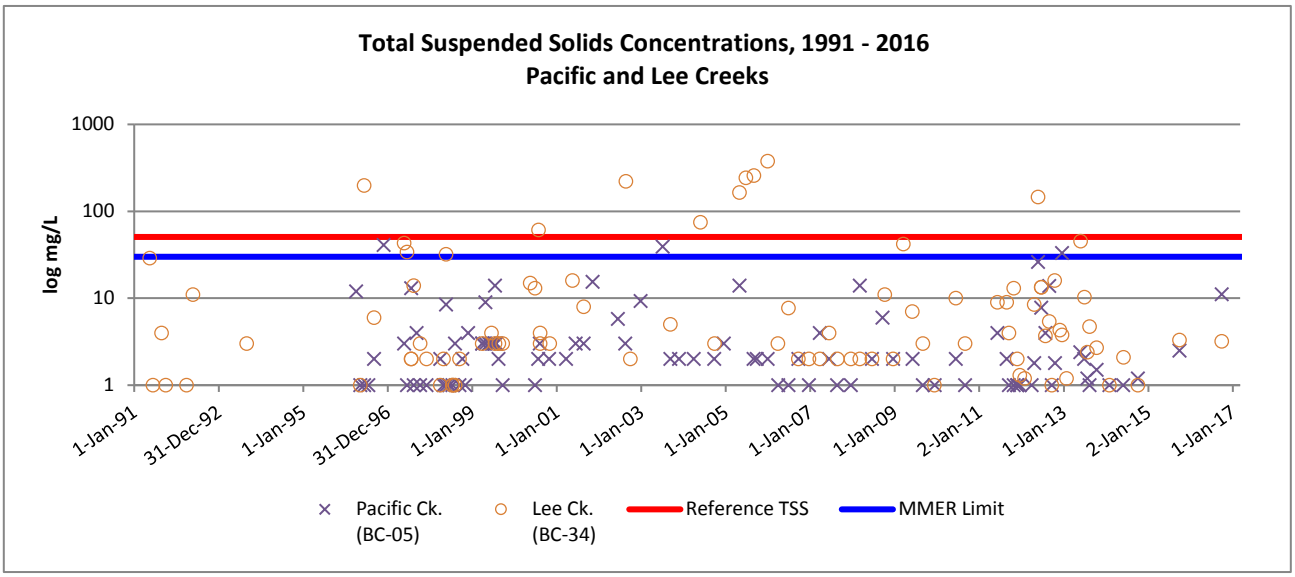

Total Suspended Solids Concentrations, 1991 - 2016
Lucky and Golden Creeks
log mg/L
10000
1000
100
10
1
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
MMER Limit

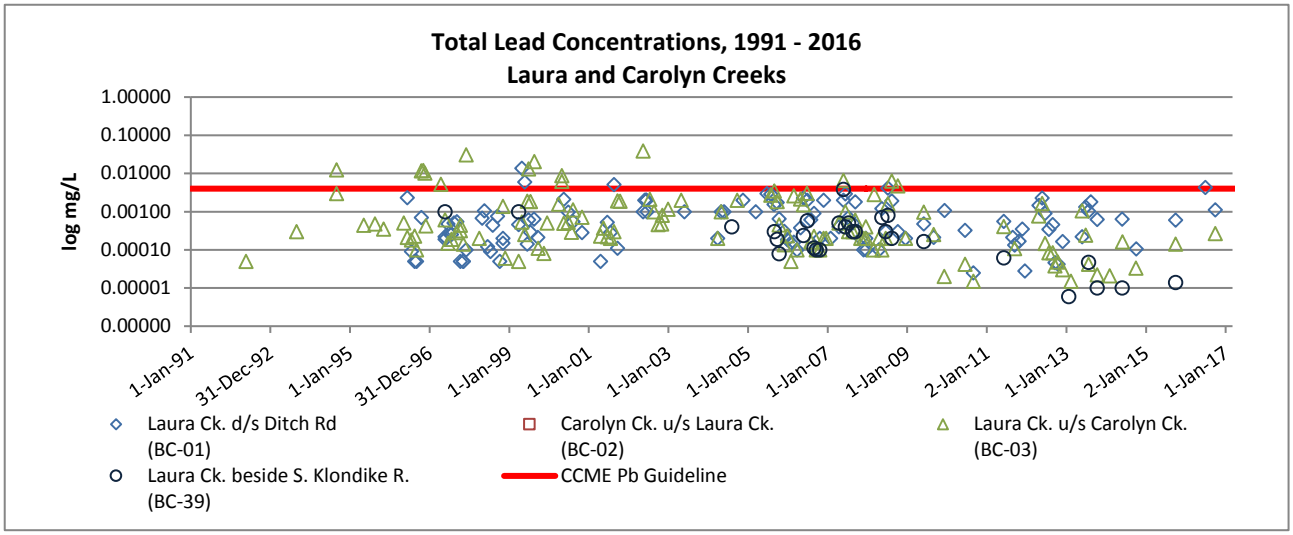

Total Nitrate Concentrations, 1991 - 2016
Lucky and Golden Creeks
log mg/L
10.000
1.000
0.100
0.010
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
CCME NO3 Guideline

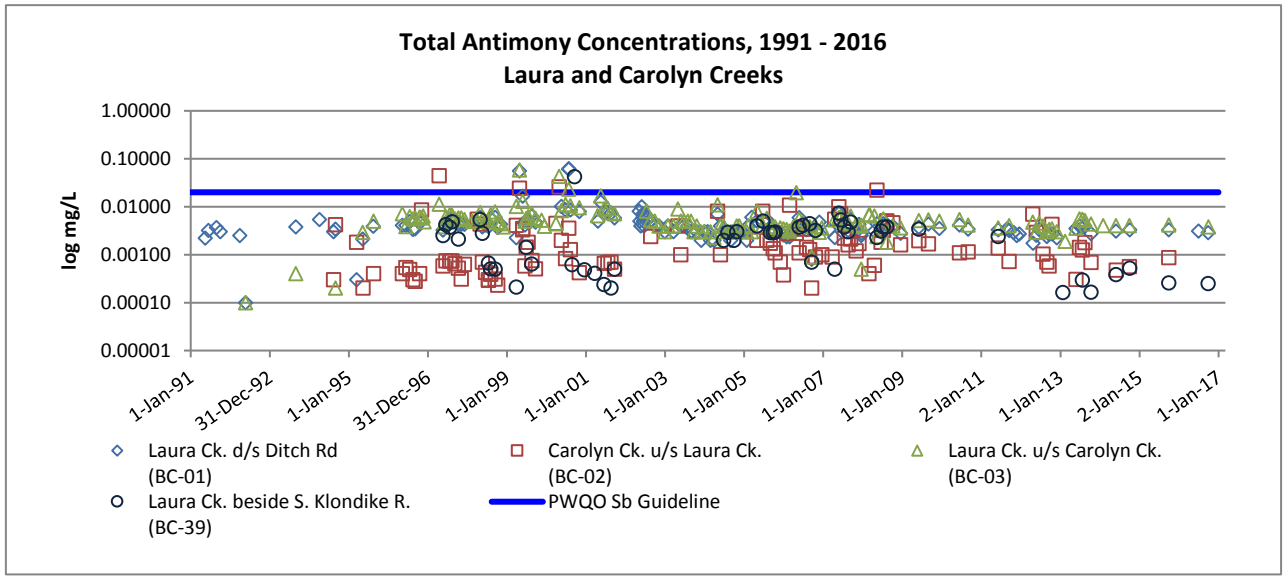

Total Zinc Concentrations, 1991 - 2016
Pacific and Lee Creeks
mg/L
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Zn
Reference Zn Conc.

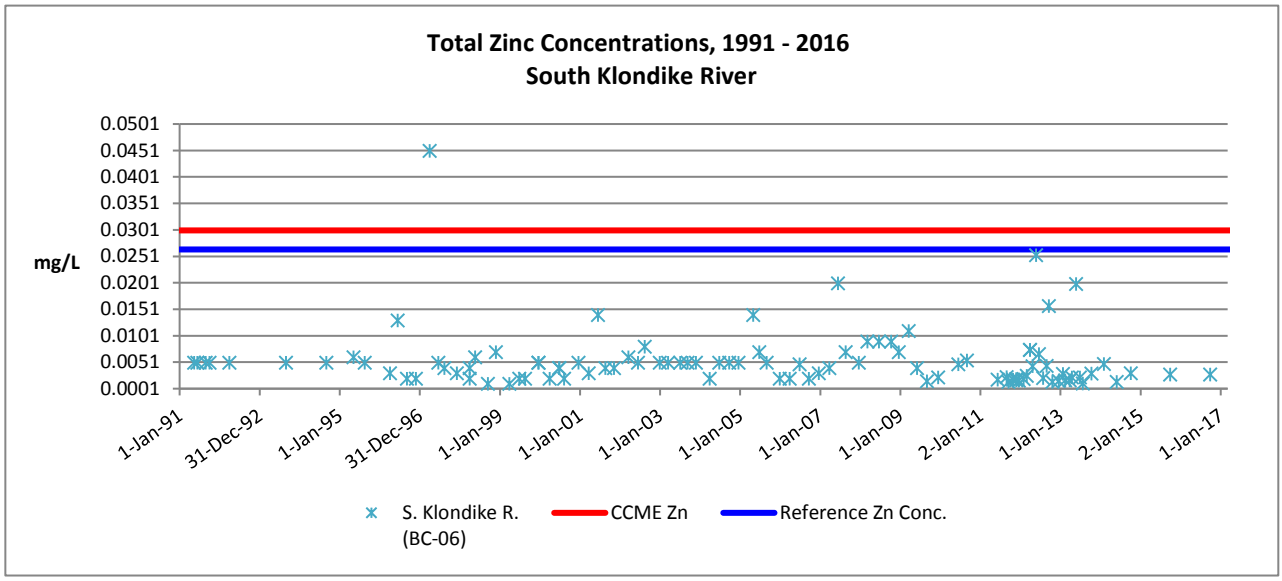

Total Copper Concentrations, 1991 - 2016
Pacific and Lee Creeks
mg/L
0.0200
0.0180
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Cu Guideline
Reference Cu Conc.

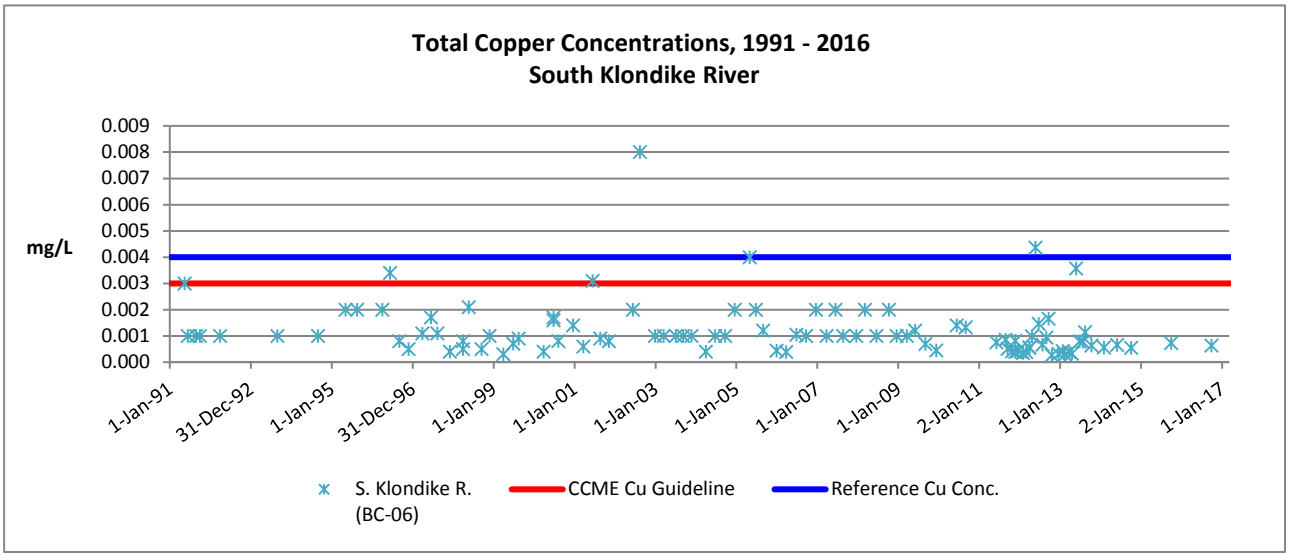

Total Lead Concentrations, 1991 - 2016
Pacific and Lee Creeks
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Pb Guideline
Reference Pb Conc.

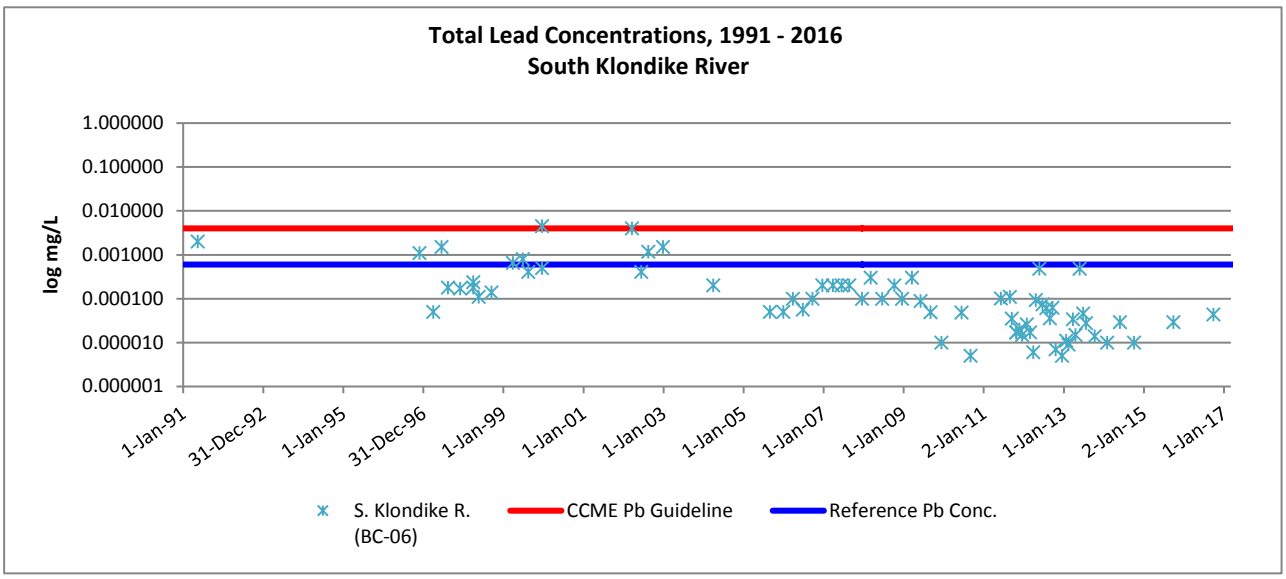

Total Suspended Solids Concentrations, 1991 - 2016
Pacific and Lee Creeks
log mg/L
1000
100
10
1
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
Reference TSS
MMER Limit

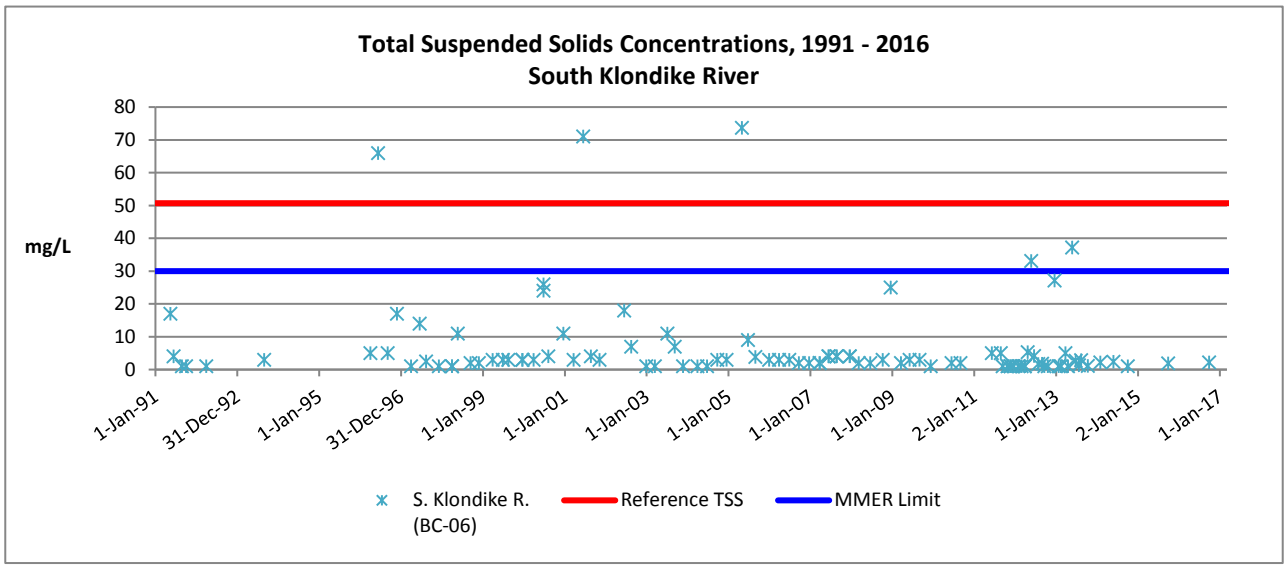

Total Lead Concentrations, 1991 - 2016
Laura and Carolyn Creeks
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
0.00000
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Laura Ck. d/s Ditch Rd (BC-01)
Carolyn Ck. u/s Laura Ck. (BC-02)
Laura Ck. u/s Carolyn Ck. (BC-03)
Laura Ck. beside S. Klondike R. (BC-39)
CCME Pb Guideline

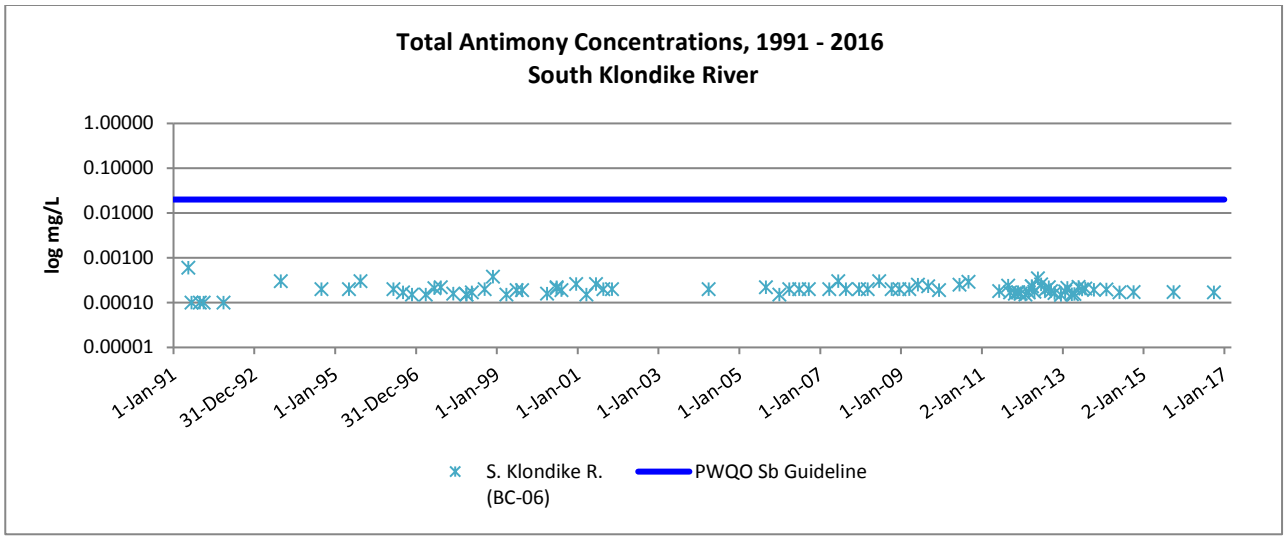

Total Antimony Concentrations, 1991 - 2016
Laura and Carolyn Creeks
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
Laura Ck. d/s Ditch Rd (BC-01)
Carolyn Ck. u/s Laura Ck. (BC-02)
Laura Ck. u/s Carolyn Ck. (BC-03)
Laura Ck. beside S. Klondike R. (BC-39)
PWQO Sb Guideline

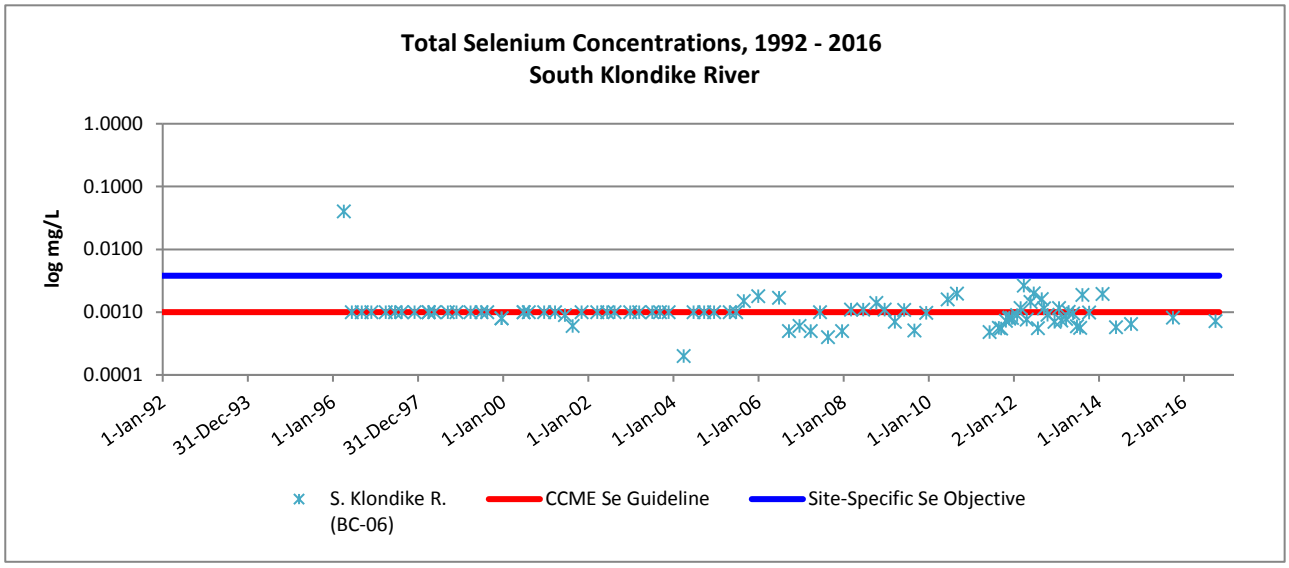

Total Zinc Concentrations, 1991 - 2016
South Klondike River
mg/L
0.0501
0.0451
0.0401
0.0351
0.0301
0.0251
0.0201
0.0151
0.0101
0.0051
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
S. Klondike R. (BC-06)
CCME Zn
Reference Zn Conc.

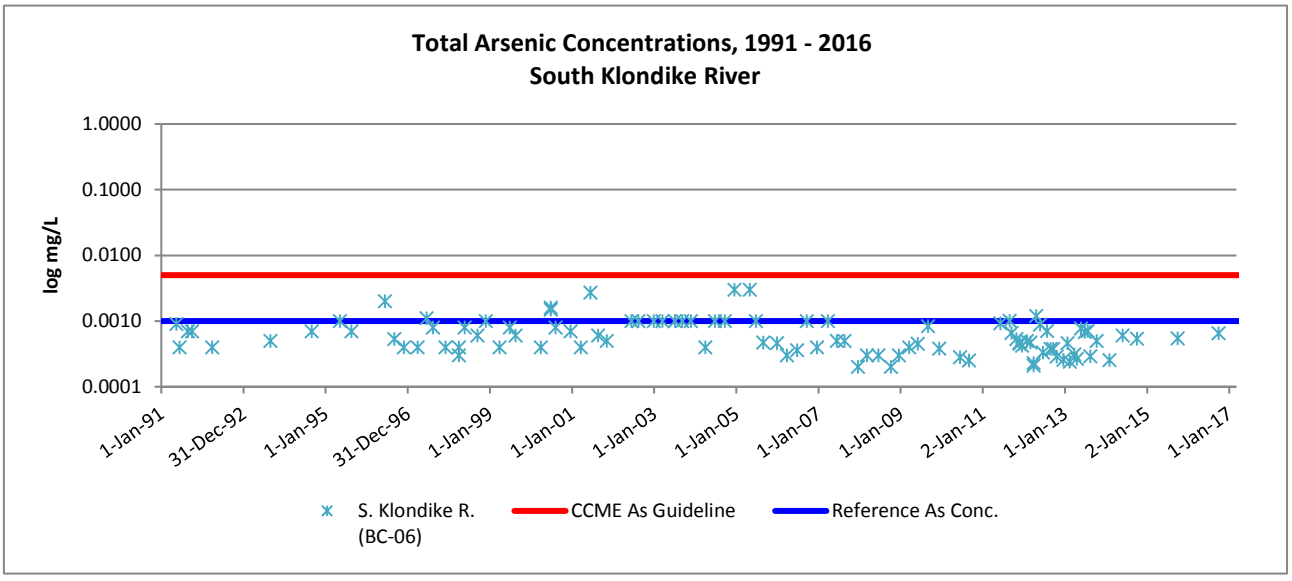

Total Copper Concentrations, 1991 - 2016
South Klondike River
mg/L
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
S. Klondike R. (BC-06)
CCME Cu Guideline
Reference Cu Conc.


Total Lead Concentrations, 1991 - 2016
South Klondike River
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
S. Klondike R. (BC-06)
CCME Pb Guideline
Reference Pb Conc.


Total Suspended Solids Concentrations, 1991 - 2016
South Klondike River
mg/L
80
70
60
50
40
30
20
10
0
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
S. Klondike R. (BC-06)
Reference TSS
MMER Limit

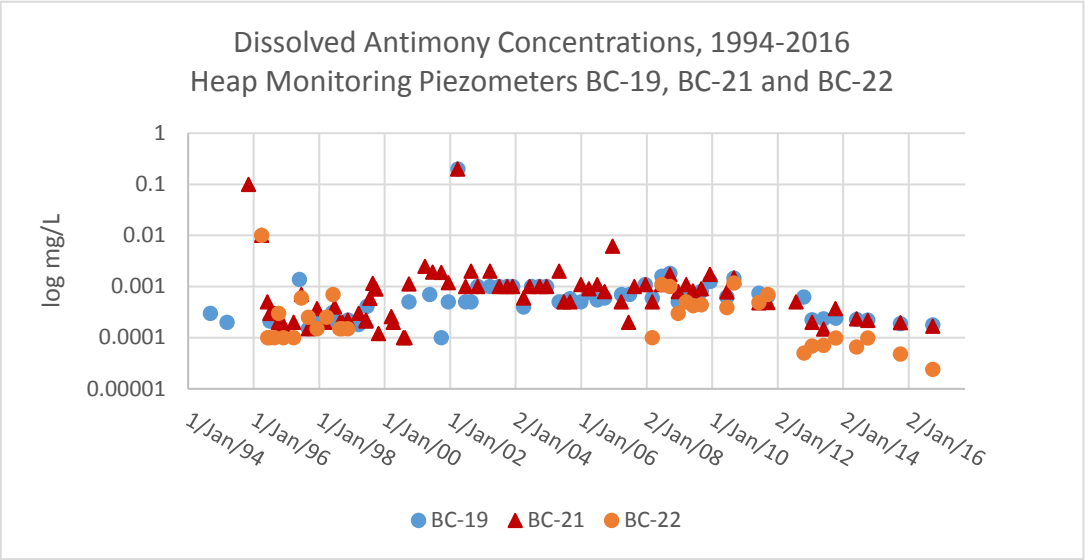

Total Antimony Concentrations, 1991 - 2016
South Klondike River
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
S. Klondike R. (BC-06)
PWQO Sb Guideline

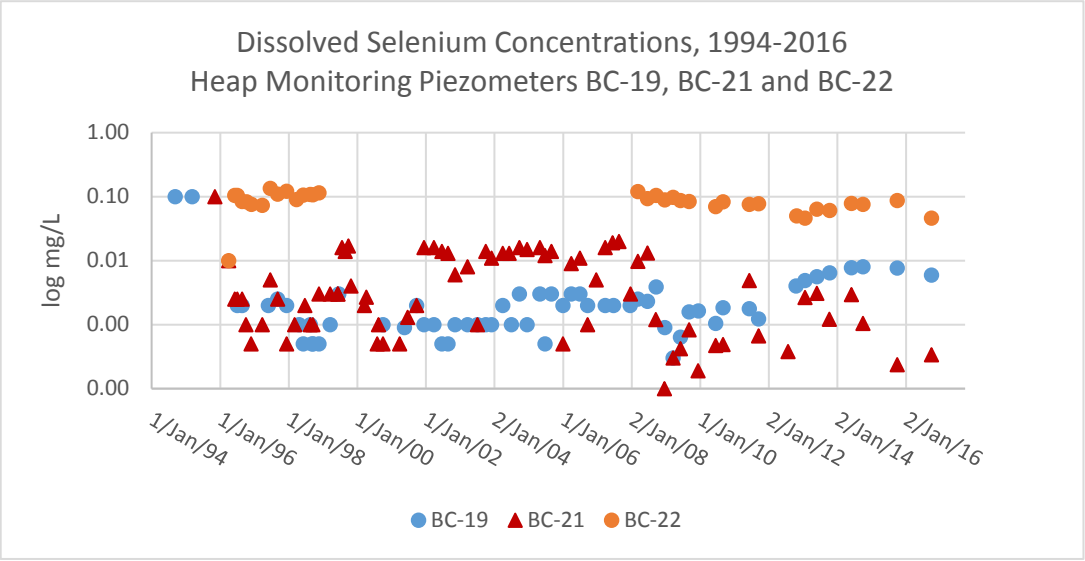

Total Selenium Concentrations, 1992 - 2016
South Klondike River
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
1-Jan-92
31-Dec-93
1-Jan-96
31-Dec-97
1-Jan-00
1-Jan-02
1-Jan-04
1-Jan-06
1-Jan-08
1-Jan-10
2-Jan-12
1-Jan-14
2-Jan-16
S. Klondike R. (BC-06)
CCME Se Guideline
Site-Specific Se Objective

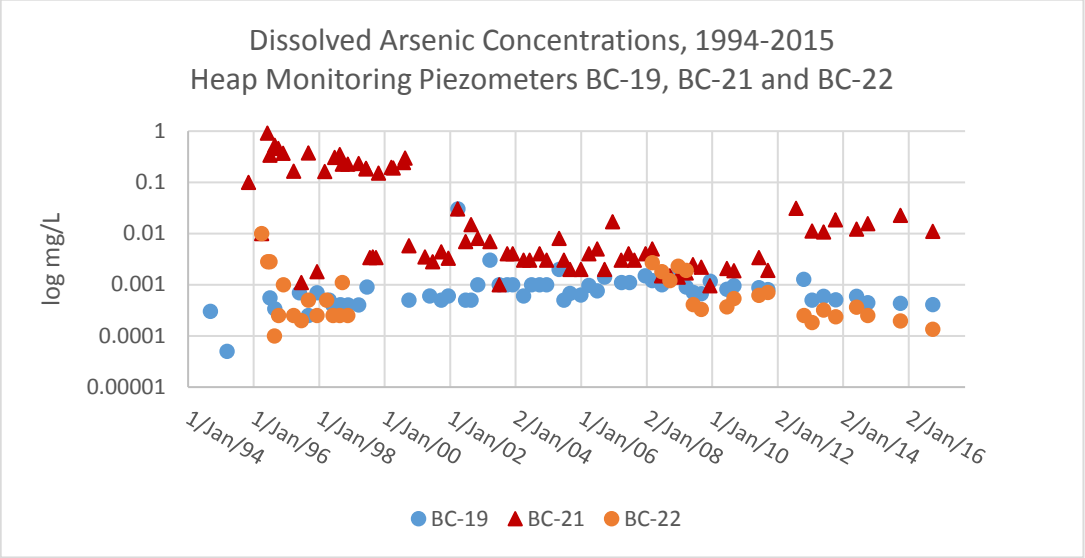

Total Arsenic Concentrations, 1991 - 2016
South Klondike River
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
1-Jan-17
S. Klondike R. (BC-06)
CCME As Guideline
Reference As Conc.

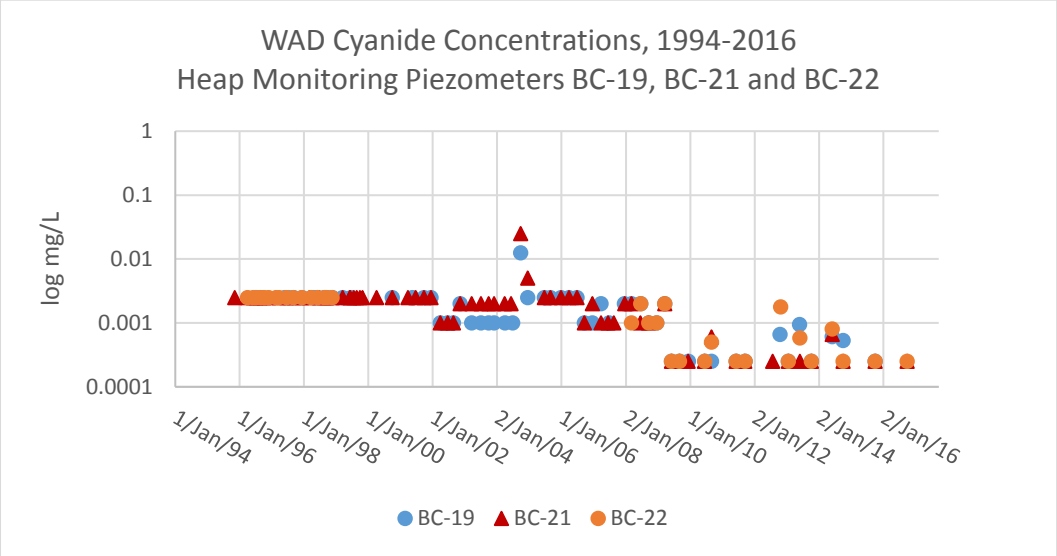
APPENDIX C

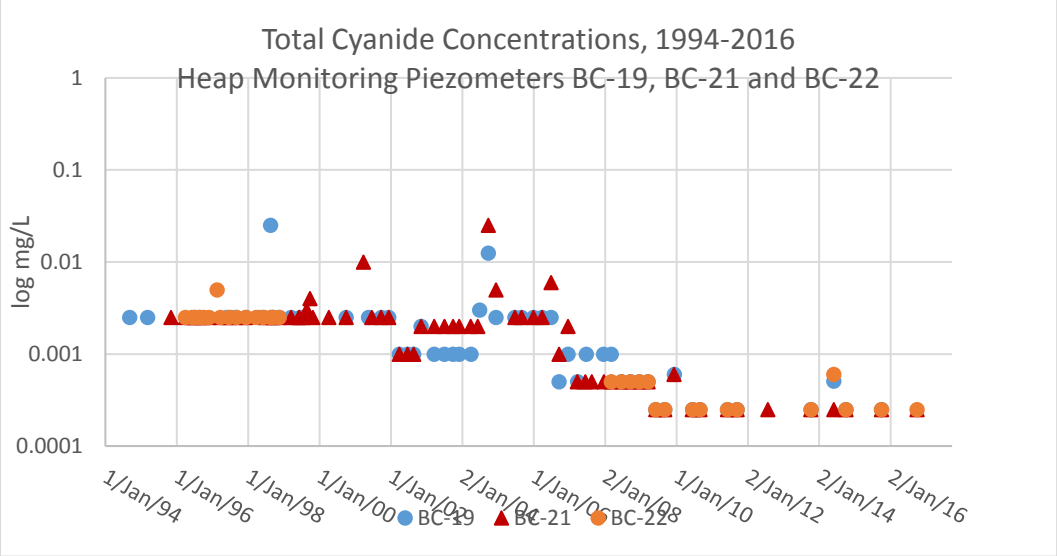
GROUNDWATER GRAPHICAL DATA

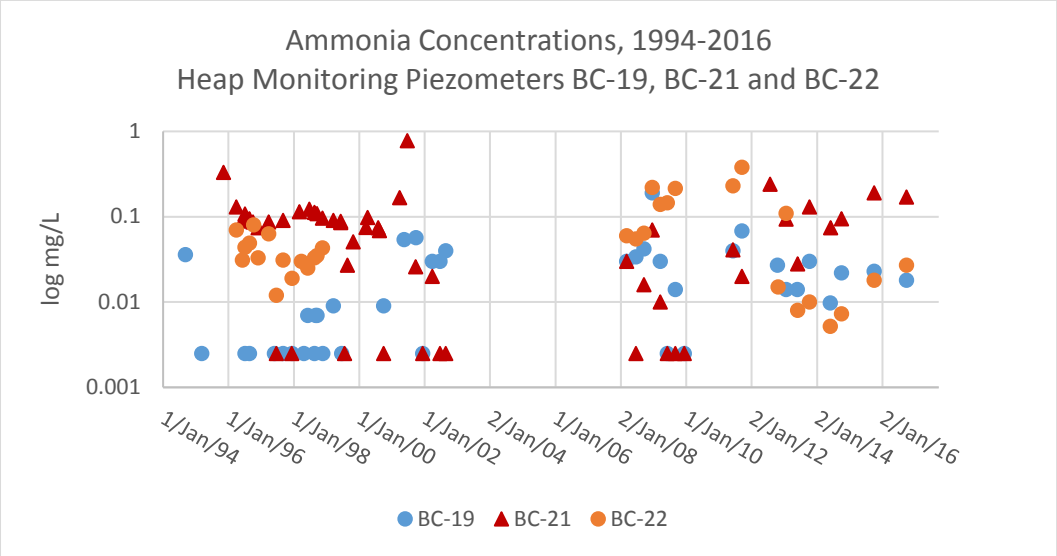

Dissolved Antimony Concentrations, 1994-2016
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/94
1/Jan/96
1/Jan/98
1/Jan/00
1/Jan/02
2/Jan/04
1/Jan/06
2/Jan/08
1/Jan/10
2/Jan/12
2/Jan/14
2/Jan/16
BC-19
BC-21
BC-22

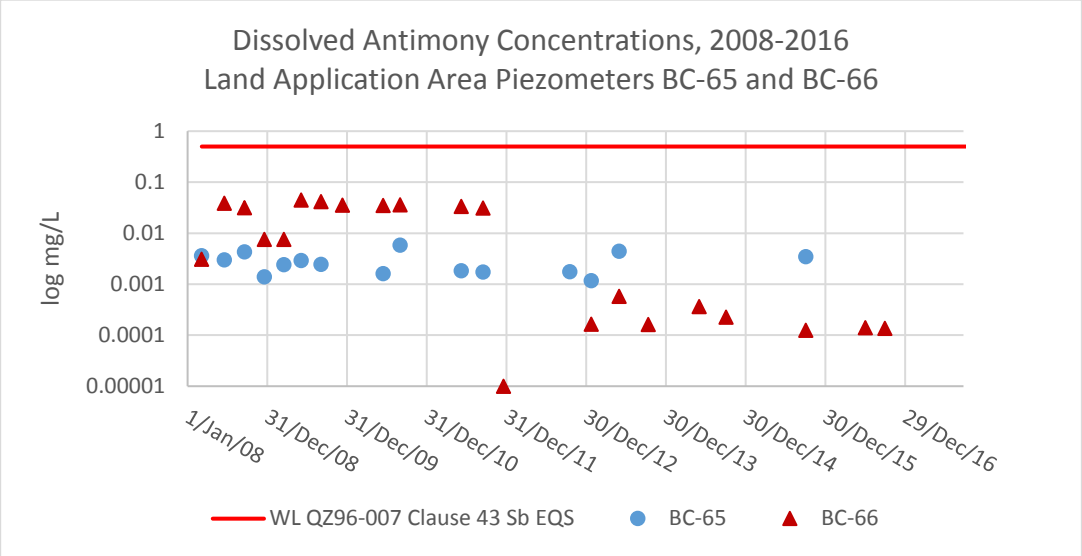

Dissolved Selenium Concentrations, 1994-2016
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1.00
0.10
0.01
0.00
0.00
1/Jan/94
1/Jan/96
1/Jan/98
1/Jan/00
1/Jan/02
2/Jan/04
1/Jan/06
2/Jan/08
1/Jan/10
2/Jan/12
2/Jan/14
2/Jan/16
BC-19
BC-21
BC-22

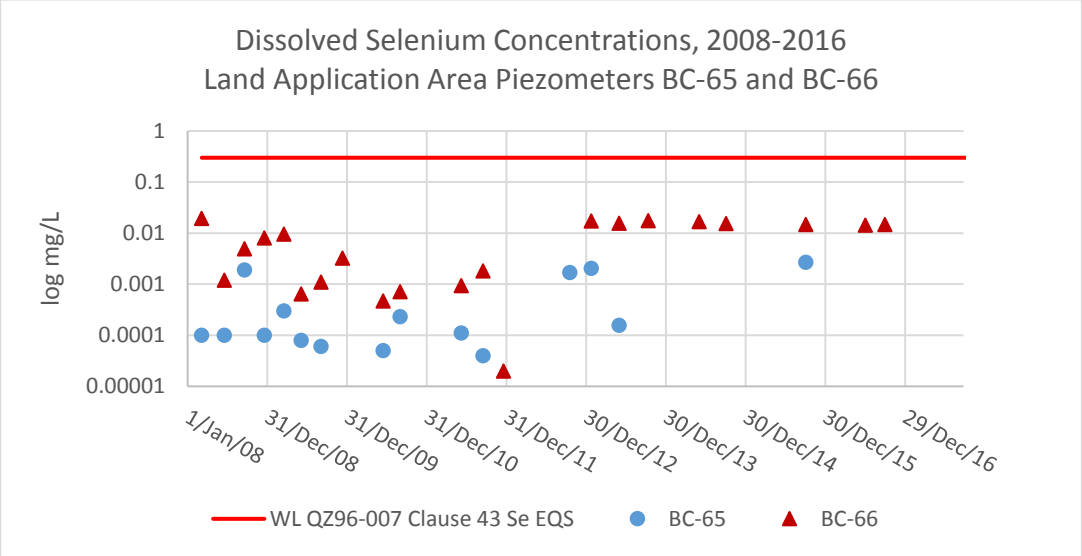

Dissolved Arsenic Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/94
1/Jan/96
1/Jan/98
1/Jan/00
1/Jan/02
2/Jan/04
1/Jan/06
2/Jan/08
1/Jan/10
2/Jan/12
2/Jan/14
2/Jan/16
BC-19
BC-21
BC-22

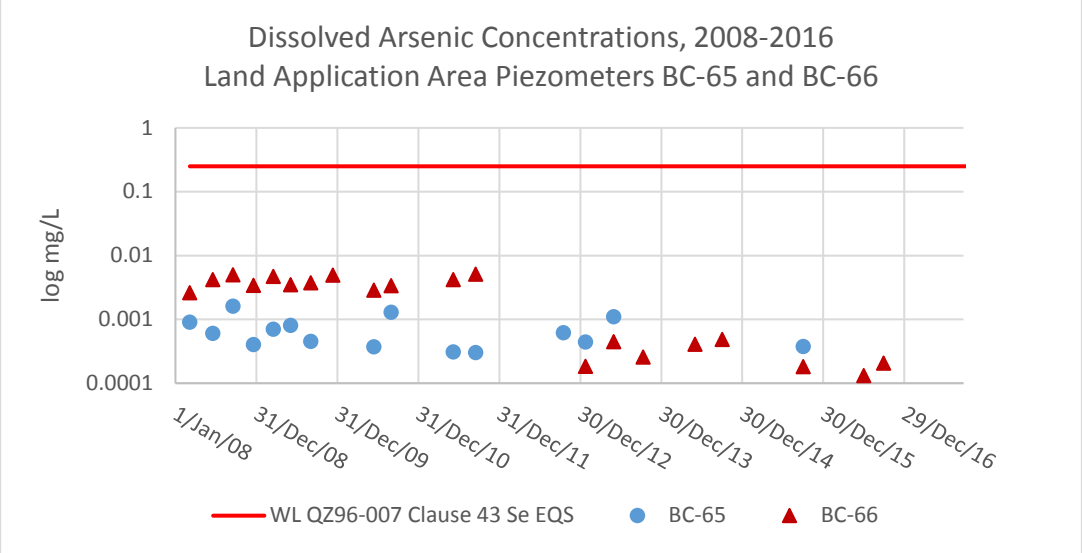

WAD Cyanide Concentrations, 1994-2016
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/94
1/Jan/96
1/Jan/98
1/Jan/00
1/Jan/02
2/Jan/04
1/Jan/06
2/Jan/08
1/Jan/10
2/Jan/12
2/Jan/14
2/Jan/16
BC-19
BC-21
BC-22

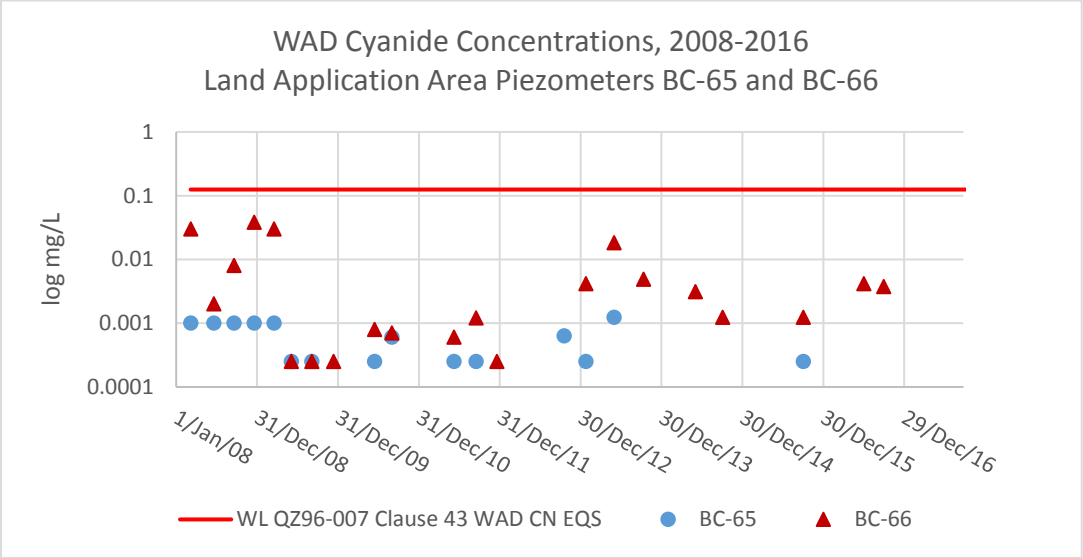

Total Cyanide Concentrations, 1994-2016
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/94
1/Jan/96
1/Jan/98
1/Jan/00
1/Jan/02
2/Jan/04
1/Jan/06
2/Jan/08
1/Jan/10
2/Jan/12
2/Jan/14
2/Jan/16
BC-19
BC-21
BC-22

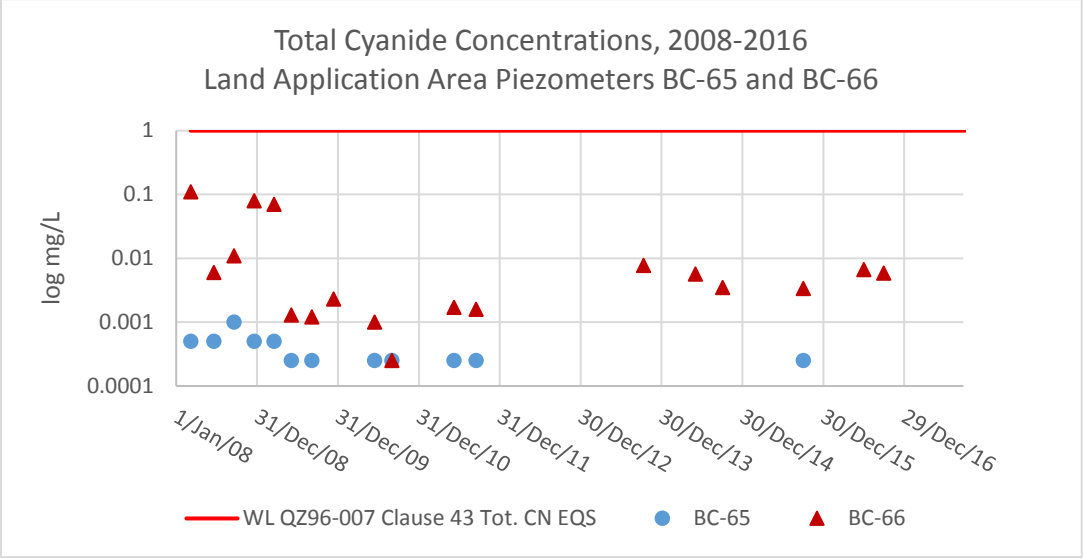

Ammonia Concentrations, 1994-2016
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
1/Jan/94
1/Jan/96
1/Jan/98
1/Jan/00
1/Jan/02
2/Jan/04
1/Jan/06
2/Jan/08
1/Jan/10
2/Jan/12
2/Jan/14
2/Jan/16
BC-19
BC-21
BC-22

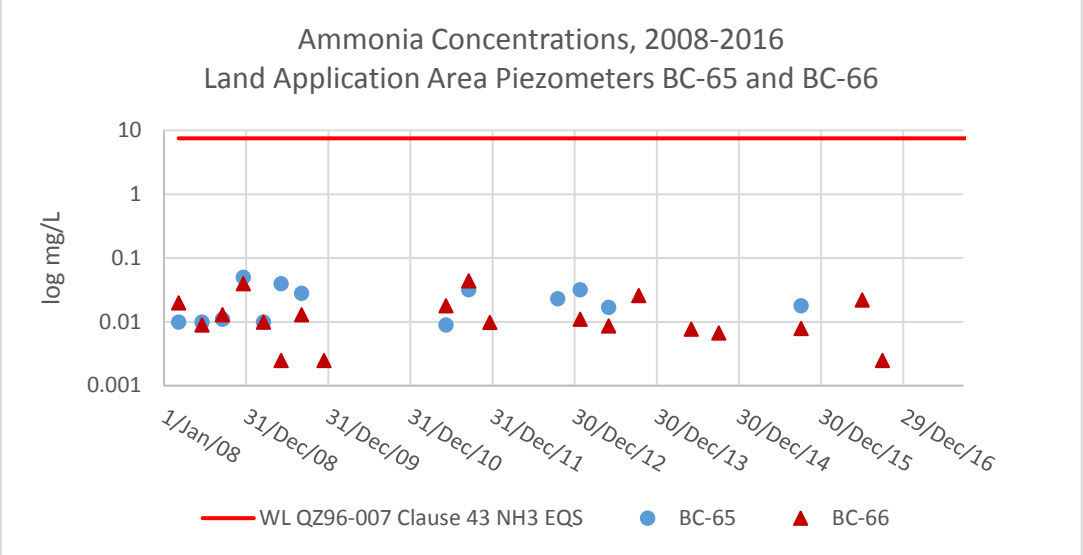

Dissolved Antimony Concentrations, 2008-2016
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
WL QZ96-007 Clause 43 Sb EQS
BC-65
BC-66

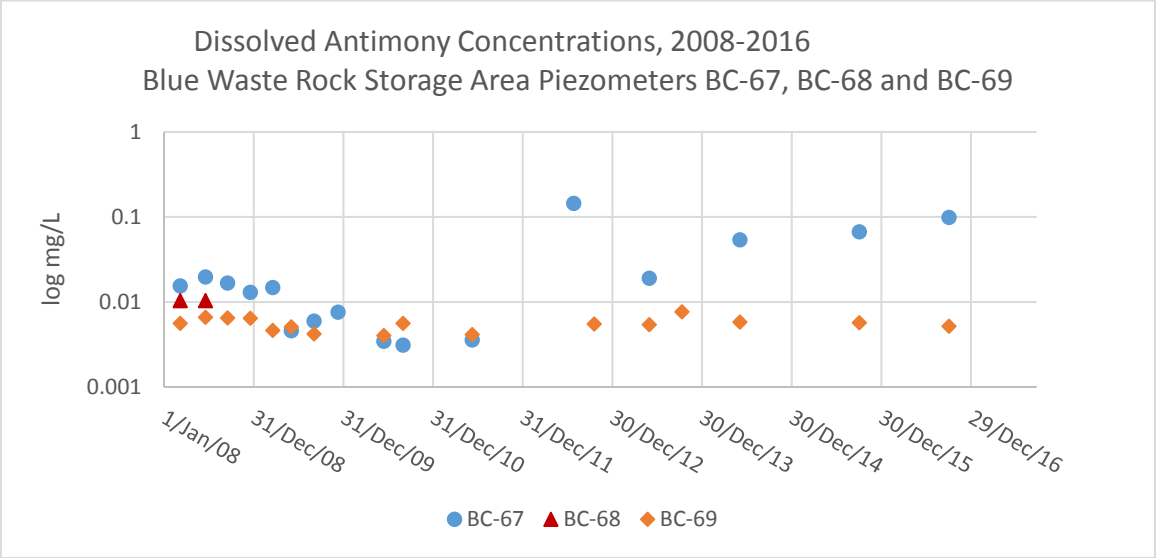

Dissolved Selenium Concentrations, 2008-2016
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
WL QZ96-007 Clause 43 Se EQS
BC-65
BC-66

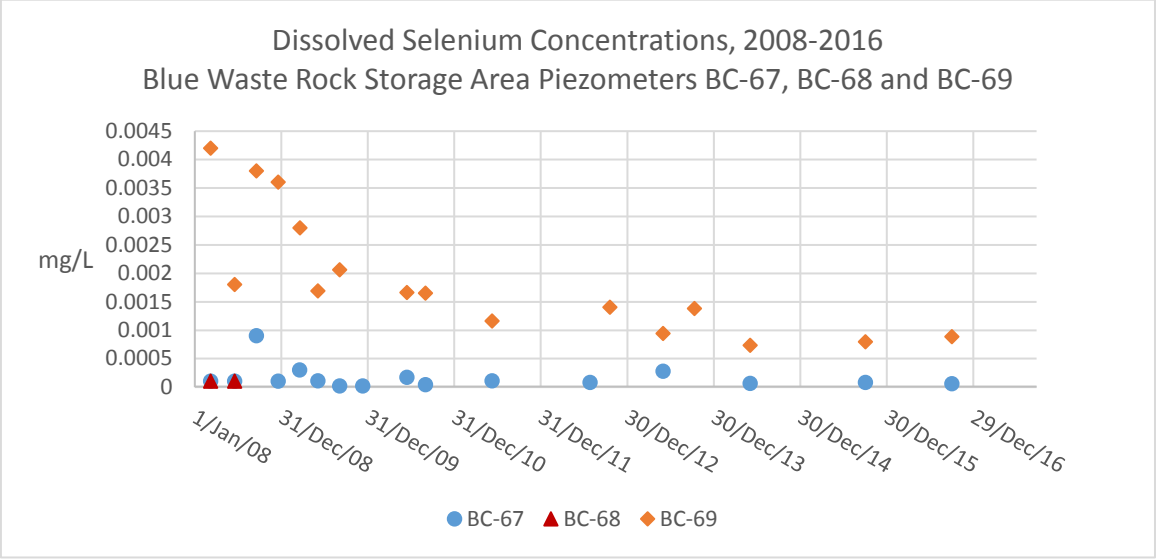

Dissolved Arsenic Concentrations, 2008-2016
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
WL QZ96-007 Clause 43 Se EQS
BC-65
BC-66

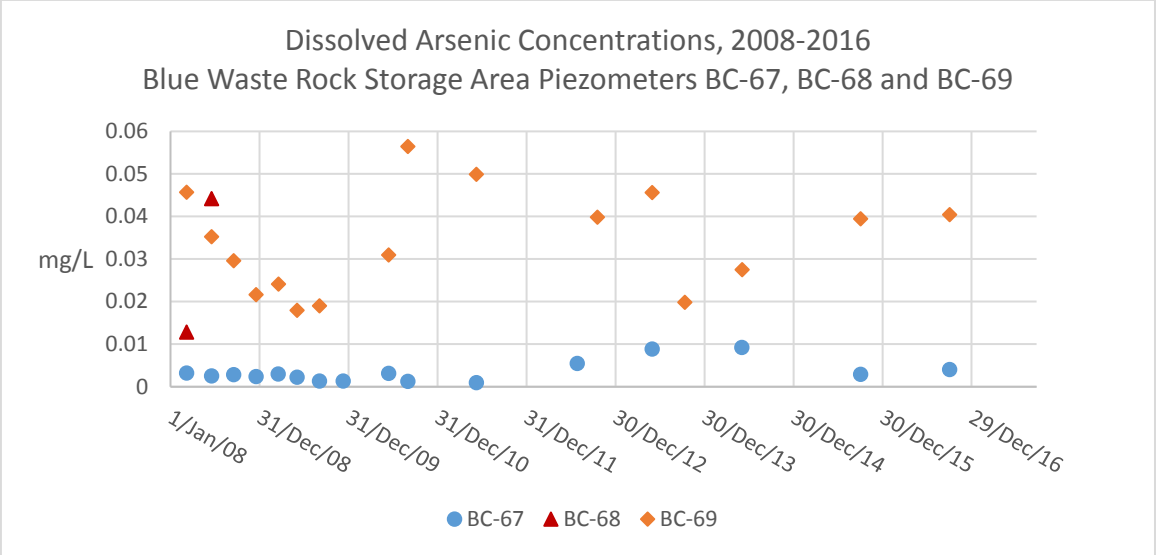

WAD Cyanide Concentrations, 2008-2016
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
WL QZ96-007 Clause 43 WAD CN EQS
BC-65
BC-66

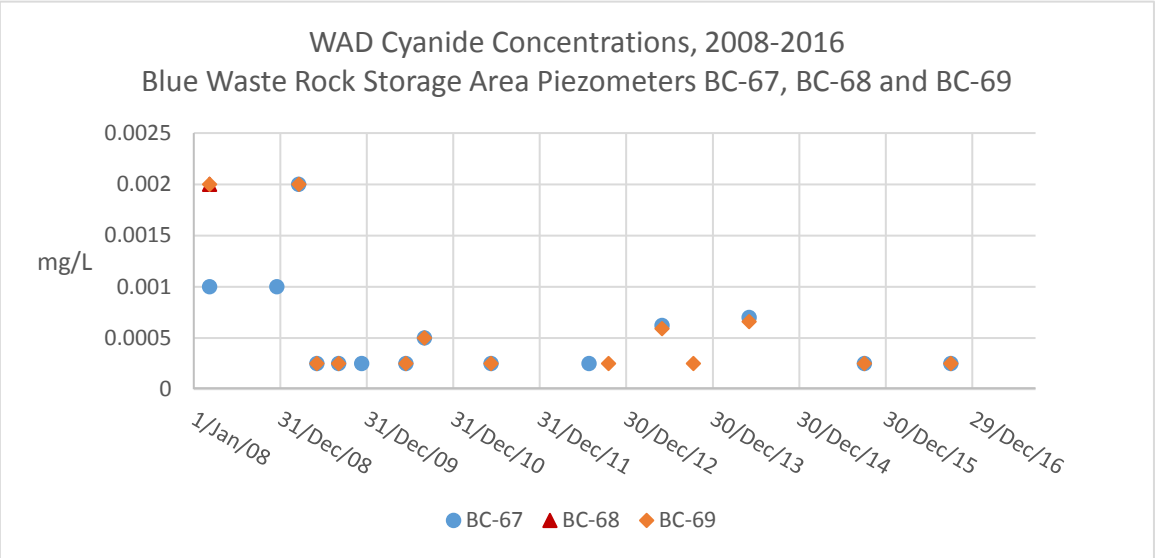

Total Cyanide Concentrations, 2008-2016
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
WL QZ96-007 Clause 43 Tot. CN EQS
BC-65
BC-66

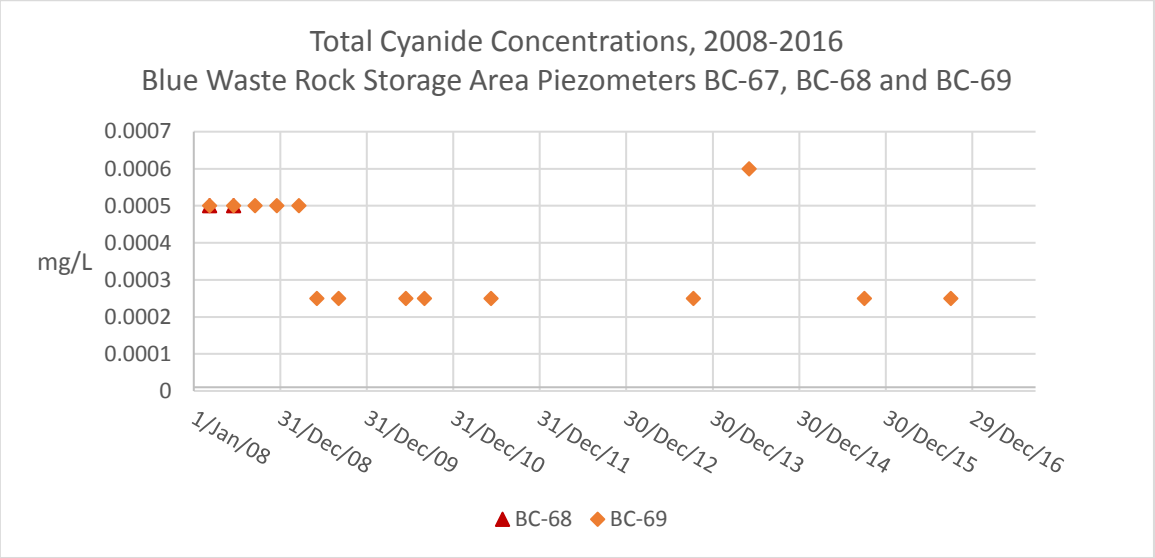

Ammonia Concentrations, 2008-2016
Land Application Area Piezometers BC-65 and BC-66
log mg/L
10
1
0.1
0.01
0.001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
WL QZ96-007 Clause 43 NH3 EQS
BC-65
BC-66

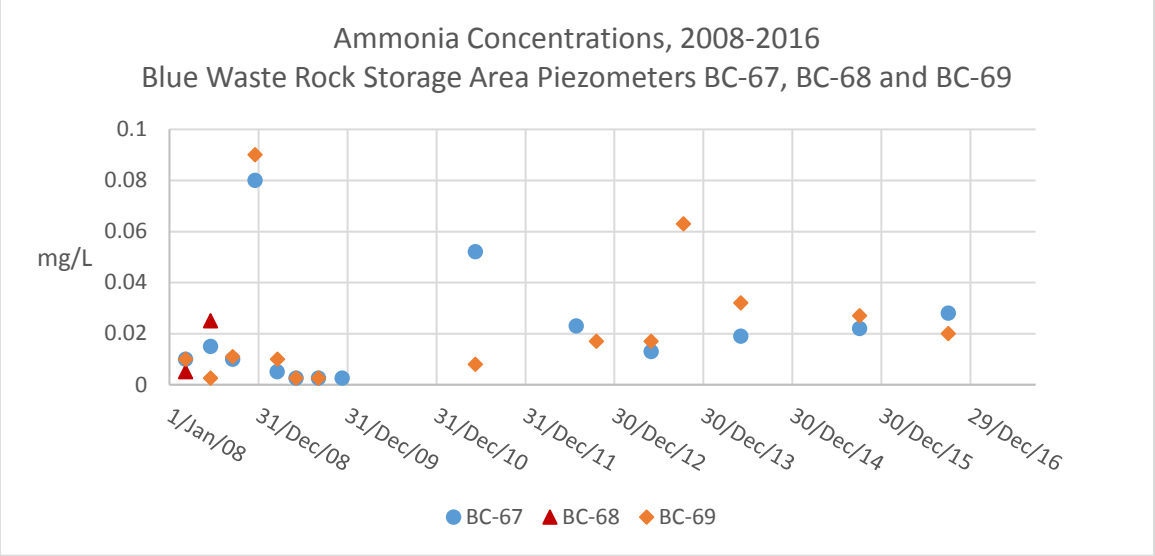

Dissolved Antimony Concentrations, 2008-2016
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
log mg/L
1
0.1
0.01
0.001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
BC-67
BC-68
BC-69


Dissolved Selenium Concentrations, 2008-2016
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.0045
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
BC-67
BC-68
BC-69


Dissolved Arsenic Concentrations, 2008-2016
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.06
0.05
0.04
0.03
0.02
0.01
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
BC-67
BC-68
BC-69


WAD Cyanide Concentrations, 2008-2016
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.0025
0.002
0.0015
0.001
0.0005
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
BC-67
BC-68
BC-69


Total Cyanide Concentrations, 2008-2016
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
BC-68
BC-69


Ammonia Concentrations, 2008-2016
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.1
0.08
0.06
0.04
0.02
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
29/Dec/16
BC-67
BC-68
BC-69

APPENDIX B

LAB REPORTS – CERTIFICATE OF ANALYSIS

Your Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Your C.O.C. #: 496620-01-01, 496620-02-01

Attention:Kai Woloshyn

Alexco Environmental Group Inc.
Unit 3 Calcite Business Centre
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 2V3

Report Date: 2016/09/12
Report #: R2258201
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B653528
Received: 2016/07/02, 12:15

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	7	2016/07/02	2016/07/02	BBY6SOP-00026	SM 22 2320 B m
Chloride by Automated Colourimetry	6	N/A	2016/07/04	BBY6SOP-00011	SM 22 4500-Cl- E m
Chloride by Automated Colourimetry	1	N/A	2016/07/05	BBY6SOP-00011	SM 22 4500-Cl- E m
Cyanide SAD (strong acid dissociable)	10	N/A	2016/07/06	BBY6SOP-00004	SM 22 4500-CN O m
Cyanide WAD (weak acid dissociable)	10	N/A	2016/07/06	BBY6SOP-00004	SM 22 4500-CN O m
Conductance - water	7	N/A	2016/07/02	BBY6SOP-00026	SM 22 2510 B m
Hardness Total (calculated as CaCO3)	3	N/A	2016/07/05	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO3)	1	N/A	2016/07/06	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO3)	4	N/A	2016/07/07	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	6	N/A	2016/07/06	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	4	N/A	2016/07/07	BBY WI-00033	Auto Calc
Mercury (Dissolved-LowLevel) by CVAF	10	N/A	2016/07/07	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Mercury (Total-LowLevel) by CVAF	7	2016/07/07	2016/07/07	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Mercury (Total-LowLevel) by CVAF	1	2016/07/08	2016/07/08	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Ion Balance	6	N/A	2016/07/06	BBY WI-00033	Auto Calc
Ion Balance	1	N/A	2016/07/07	BBY WI-00033	Auto Calc
Sum of cations, anions	3	N/A	2016/07/05	Calc	
Sum of cations, anions	3	N/A	2016/07/06	Calc	
Sum of cations, anions	1	N/A	2016/07/07	Calc	
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	6	N/A	2016/07/06	BBY7SOP-00002	EPA 6020B R2 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	4	N/A	2016/07/07	BBY7SOP-00002	EPA 6020B R2 m
Elements by ICPMS Low Level (dissolved)	10	N/A	2016/07/06	BBY7SOP-00002	EPA 6020B R2 m
Elements by ICPMS Digested LL (total)	3	2016/07/04	2016/07/05	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Na, K, Ca, Mg, S by CRC ICPMS (total)	3	N/A	2016/07/05	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2016/07/06	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	N/A	2016/07/07	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Elements by ICPMS Low Level (total)	5	N/A	2016/07/06	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Ammonia-N (Unpreserved)	1	N/A	2016/07/04	BBY6SOP-00009	SM 22 4500-NH3- G m
Ammonia-N (Preserved)	9	N/A	2016/07/04	BBY6SOP-00009	SM 22 4500-NH3- G m

Your Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Your C.O.C. #: 496620-01-01, 496620-02-01

Attention:Kai Woloshyn

Alexco Environmental Group Inc.
Unit 3 Calcite Business Centre
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 2V3

Report Date: 2016/09/12
Report #: R2258201
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B653528
Received: 2016/07/02, 12:15

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrate+Nitrite (N) (low level)	7	N/A	2016/07/02	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) (low level)	7	N/A	2016/07/02	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	7	N/A	2016/07/05	BBY6SOP-00010	SM 22 4500-NO3- I m
Filter and HNO3 Preserve for Metals	4	N/A	2016/07/04	BBY7 WI-00004	BCMOE Reqs 08/14
Filter and HNO3 Preserve for Metals	5	N/A	2016/07/06	BBY7 WI-00004	BCMOE Reqs 08/14
pH Water (1)	7	N/A	2016/07/02	BBY6SOP-00026	SM 22 4500-H+ B m
Sulphate by Automated Colourimetry	7	N/A	2016/07/04	BBY6SOP-00017	SM 22 4500-SO42- E m
Total Dissolved Solids (Filt. Residue)	2	2016/07/02	2016/07/04	BBY6SOP-00033	SM 22 2540 C m
Total Dissolved Solids (Filt. Residue)	2	2016/07/04	2016/07/05	BBY6SOP-00033	SM 22 2540 C m
Total Dissolved Solids (Filt. Residue)	1	2016/07/05	2016/07/06	BBY6SOP-00033	SM 22 2540 C m
Total Suspended Solids-Low Level	5	2016/07/04	2016/07/05	BBY6SOP-00034	SM 22 2540 D
Total Suspended Solids-Low Level	5	2016/07/05	2016/07/06	BBY6SOP-00034	SM 22 2540 D

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Megan Smith, Project Manager
Email: msmith@maxxam.ca
Phone# (604) 734 7276

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		OY5561		OY5562		OY5563		OY5564		
Sampling Date		2016/06/29 18:00		2016/06/29 17:36		2016/06/29 17:04		2016/06/29 16:40		
COC Number		496620-01-01		496620-01-01		496620-01-01		496620-01-01		
	UNITS	BC-28A	RDL	BC-28B	RDL	DUP-2	RDL	BC-66	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L						N/A	7.8	N/A	8317221
Cation Sum	meq/L						N/A	7.8	N/A	8317221
Filter and HNO3 Preservation	N/A	FIELD	N/A	FIELD	N/A	FIELD	N/A	FIELD	N/A	ONSITE
Ion Balance	N/A						0.010	1.0	0.010	8317220
Nitrate (N)	mg/L						0.10	32.9	0.10	8317251
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.447	0.0050	0.0637	0.00050	0.488	0.0050	0.00668	0.00050	8321174
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.0377	0.00050	0.0532	0.00050	0.131	0.0050	0.00416	0.00050	8321176
Alkalinity (Total as CaCO3)	mg/L							242	0.50	8317343
Alkalinity (PP as CaCO3)	mg/L							<0.50	0.50	8317343
Bicarbonate (HCO3)	mg/L							296	0.50	8317343
Carbonate (CO3)	mg/L							<0.50	0.50	8317343
Hydroxide (OH)	mg/L							<0.50	0.50	8317343
Anions										
Dissolved Sulphate (SO4)	mg/L							22.3	0.50	8318793
Dissolved Chloride (Cl)	mg/L							5.5	0.50	8318790
Nutrients										
Total Ammonia (N)	mg/L	0.019	0.0050	0.14	0.0050	0.016	0.0050	0.022	0.0050	8318609
Nitrate plus Nitrite (N)	mg/L							32.9 (1)	0.10	8317403
Nitrite (N)	mg/L							<0.0020	0.0020	8317405
Physical Properties										
Conductivity	uS/cm							760	1.0	8317342
pH	pH							8.03		8317341
Physical Properties										
Total Suspended Solids	mg/L	<1.0	1.0	1.1	1.0	<1.0	1.0	7.0	1.0	8316914

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		OY5565			OY5566	OY5567		
Sampling Date		2016/06/29 14:20			2016/06/30 10:15	2016/06/30 09:26		
COC Number		496620-01-01			496620-01-01	496620-01-01		
	UNITS	DUP-1	RDL	QC Batch	BC-1	BC-37	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	8.0	N/A	8317221	5.4	3.6	N/A	8317221
Cation Sum	meq/L	7.3	N/A	8317221	5.2	3.4	N/A	8317221
Filter and HNO3 Preservation	N/A	FIELD	N/A	ONSITE	FIELD	FIELD	N/A	ONSITE
Ion Balance	N/A	0.92	0.010	8317220	0.97	0.94	0.010	8317220
Nitrate (N)	mg/L	34.1	0.10	8317251	0.176	0.0991	0.0020	8317251
Misc. Inorganics								
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00998	0.00050	8321174	<0.00050	<0.00050	0.00050	8321174
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.00789	0.00050	8321176	<0.00050	<0.00050	0.00050	8321176
Alkalinity (Total as CaCO3)	mg/L	245	0.50	8317343	142	101	0.50	8317343
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8317343	<0.50	<0.50	0.50	8317343
Bicarbonate (HCO3)	mg/L	299	0.50	8317343	173	123	0.50	8317343
Carbonate (CO3)	mg/L	<0.50	0.50	8317343	<0.50	<0.50	0.50	8317343
Hydroxide (OH)	mg/L	<0.50	0.50	8317343	<0.50	<0.50	0.50	8317343
Anions								
Dissolved Sulphate (SO4)	mg/L	22.6	0.50	8318793	123	76.2	0.50	8318793
Dissolved Chloride (Cl)	mg/L	5.8	0.50	8320245	1.0	0.78	0.50	8318790
Nutrients								
Total Ammonia (N)	mg/L	0.027	0.0050	8318609	0.047	0.032	0.0050	8318609
Nitrate plus Nitrite (N)	mg/L	34.1 (1)	0.10	8317403	0.176	0.0991	0.0020	8317403
Nitrite (N)	mg/L	0.0022	0.0020	8317405	<0.0020	<0.0020	0.0020	8317405
Physical Properties								
Conductivity	uS/cm	758	1.0	8317342	503	343	1.0	8317342
pH	pH	8.00		8317341	8.22	8.17		8317341
Physical Properties								
Total Suspended Solids	mg/L	6.3	1.0	8316914	454	104	1.0	8319275
Total Dissolved Solids	mg/L				328	212	10	8317171

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		OY5568		OY5569		OY5570		
Sampling Date		2016/06/30 09:05		2016/07/02 12:15		2016/06/30 10:55		
COC Number		496620-01-01		496620-02-01		496620-02-01		
	UNITS	BC-53	QC Batch	TRIP BLANK	QC Batch	FIELD BLANK	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	3.6	8317221	0.0000	8317221	0.0000	N/A	8317221
Cation Sum	meq/L	3.5	8317221	0.0017	8317221	0.0021	N/A	8317221
Filter and HNO3 Preservation	N/A	FIELD	ONSITE		ONSITE	FIELD	N/A	ONSITE
Ion Balance	N/A	0.97	8317220	NC	8317220	NC	0.010	8317220
Nitrate (N)	mg/L	0.0910	8317251	<0.0020	8317251	<0.0020	0.0020	8317251
Misc. Inorganics								
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00062	8321174	<0.00050	8321174	<0.00050	0.00050	8321174
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.00063	8321176	<0.00050	8321176	0.00058	0.00050	8321176
Alkalinity (Total as CaCO3)	mg/L	98.9	8317343	<0.50	8317343	<0.50	0.50	8317343
Alkalinity (PP as CaCO3)	mg/L	<0.50	8317343	<0.50	8317343	<0.50	0.50	8317343
Bicarbonate (HCO3)	mg/L	121	8317343	<0.50	8317343	<0.50	0.50	8317343
Carbonate (CO3)	mg/L	<0.50	8317343	<0.50	8317343	<0.50	0.50	8317343
Hydroxide (OH)	mg/L	<0.50	8317343	<0.50	8317343	<0.50	0.50	8317343
Anions								
Dissolved Sulphate (SO4)	mg/L	76.9	8318793	<0.50	8318793	<0.50	0.50	8318793
Dissolved Chloride (Cl)	mg/L	0.75	8318790	<0.50	8318790	<0.50	0.50	8318790
Nutrients								
Total Ammonia (N)	mg/L	0.016	8318609	<0.0050	8318610	<0.0050	0.0050	8318609
Nitrate plus Nitrite (N)	mg/L	0.0939	8317403	<0.0020	8317403	<0.0020	0.0020	8317403
Nitrite (N)	mg/L	0.0029	8317405	<0.0020	8317405	<0.0020	0.0020	8317405
Physical Properties								
Conductivity	uS/cm	342	8317342	<1.0	8317342	<1.0	1.0	8317342
pH	pH	8.18	8317341	5.78	8317341	5.68		8317341
Physical Properties								
Total Suspended Solids	mg/L	85.7	8319275	<1.0	8319275	<1.0	1.0	8319275
Total Dissolved Solids	mg/L	212	8319465	<10	8317868	<10	10	8317868

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		OY5561	OY5562	OY5563		OY5564		
Sampling Date		2016/06/29 18:00	2016/06/29 17:36	2016/06/29 17:04		2016/06/29 16:40		
COC Number		496620-01-01	496620-01-01	496620-01-01		496620-01-01		
	UNITS	BC-28A	BC-28B	DUP-2	RDL	BC-66	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	1300	983	1300	0.50	364	0.50	8317196
Elements								
Dissolved Mercury (Hg)	mg/L	0.0000438	0.0000199	0.0000437	0.0000020	<0.0000020	0.0000020	8322417
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.0060	0.0680	0.0051	0.0025	0.00109	0.00050	8318286
Dissolved Antimony (Sb)	mg/L	1.86	1.56	1.83	0.00010	0.000140	0.000020	8318286
Dissolved Arsenic (As)	mg/L	0.307	0.193	0.300	0.00010	0.000131	0.000020	8318286
Dissolved Barium (Ba)	mg/L	0.0419	0.0315	0.0420	0.00010	0.0492	0.000020	8318286
Dissolved Beryllium (Be)	mg/L	<0.000050	<0.000050	<0.000050	0.000050	<0.000010	0.000010	8318286
Dissolved Bismuth (Bi)	mg/L	<0.000025	<0.000025	<0.000025	0.000025	<0.0000050	0.0000050	8318286
Dissolved Boron (B)	mg/L	<0.050	<0.050	<0.050	0.050	<0.010	0.010	8318286
Dissolved Cadmium (Cd)	mg/L	0.000352	<0.000025	0.000351	0.000025	0.0000170	0.0000050	8318286
Dissolved Chromium (Cr)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00010	0.00010	8318286
Dissolved Cobalt (Co)	mg/L	0.696	0.466	0.672	0.000025	0.0753	0.0000050	8318286
Dissolved Copper (Cu)	mg/L	0.00135	0.00177	0.00130	0.00025	0.000501	0.000050	8318286
Dissolved Iron (Fe)	mg/L	0.211	0.0111	0.190	0.0050	0.0017	0.0010	8318286
Dissolved Lead (Pb)	mg/L	<0.000025	<0.000025	<0.000025	0.000025	0.0000080	0.0000050	8318286
Dissolved Lithium (Li)	mg/L	0.0047	0.0031	0.0041	0.0025	0.0195	0.00050	8318286
Dissolved Manganese (Mn)	mg/L	0.0263	0.0153	0.0255	0.00025	0.000152	0.000050	8318286
Dissolved Molybdenum (Mo)	mg/L	0.0186	0.0193	0.0190	0.00025	0.000137	0.000050	8318286
Dissolved Nickel (Ni)	mg/L	0.00794	0.00485	0.00785	0.00010	0.000207	0.000020	8318286
Dissolved Phosphorus (P)	mg/L	0.049	<0.010	0.052	0.010	0.0068	0.0020	8318286
Dissolved Selenium (Se)	mg/L	0.191	0.133	0.185	0.00020	0.0144	0.000040	8318286
Dissolved Silicon (Si)	mg/L	4.60	0.82	4.54	0.25	4.69	0.050	8318286
Dissolved Silver (Ag)	mg/L	<0.000025	<0.000025	<0.000025	0.000025	<0.0000050	0.0000050	8318286
Dissolved Strontium (Sr)	mg/L	1.77	1.39	1.70	0.00025	0.391	0.000050	8318286
Dissolved Thallium (Tl)	mg/L	0.000200	0.000152	0.000208	0.000010	0.0000080	0.0000020	8318286
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.00020	0.00020	8318286
Dissolved Titanium (Ti)	mg/L	<0.0025	<0.0025	<0.0025	0.0025	<0.00050	0.00050	8318286
Dissolved Uranium (U)	mg/L	0.0228	0.0186	0.0227	0.000010	0.000927	0.0000020	8318286
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.00020	0.00020	8318286
RDL = Reportable Detection Limit								

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		OY5561	OY5562	OY5563		OY5564		
Sampling Date		2016/06/29 18:00	2016/06/29 17:36	2016/06/29 17:04		2016/06/29 16:40		
COC Number		496620-01-01	496620-01-01	496620-01-01		496620-01-01		
	UNITS	BC-28A	BC-28B	DUP-2	RDL	BC-66	RDL	QC Batch
Dissolved Zinc (Zn)	mg/L	0.0126	0.00074	0.0103	0.00050	0.00285	0.00010	8318286
Dissolved Zirconium (Zr)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00010	0.00010	8318286
Dissolved Calcium (Ca)	mg/L	400	281	394	0.25	75.1	0.050	8317326
Dissolved Magnesium (Mg)	mg/L	73.3	68.5	77.1	0.25	42.9	0.050	8317326
Dissolved Potassium (K)	mg/L	5.12	4.47	5.26	0.25	2.37	0.050	8317326
Dissolved Sodium (Na)	mg/L	429	335	441	0.25	10.7	0.050	8317326
Dissolved Sulphur (S)	mg/L	290	261	276	15	7.7	3.0	8317326
RDL = Reportable Detection Limit								

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		OY5565		OY5566	OY5567		
Sampling Date		2016/06/29 14:20		2016/06/30 10:15	2016/06/30 09:26		
COC Number		496620-01-01		496620-01-01	496620-01-01		
	UNITS	DUP-1	QC Batch	BC-1	BC-37	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	340	8317196	252	165	0.50	8317196
Elements							
Dissolved Mercury (Hg)	mg/L	<0.0000020	8322417	<0.0000020	<0.0000020	0.0000020	8322417
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.00106	8318286	0.0126	0.0111	0.00050	8318286
Dissolved Antimony (Sb)	mg/L	0.000171	8318286	0.00313	0.00133	0.000020	8318286
Dissolved Arsenic (As)	mg/L	0.000143	8318286	0.00391	0.00240	0.000020	8318286
Dissolved Barium (Ba)	mg/L	0.0488	8318286	0.0554	0.0505	0.000020	8318286
Dissolved Beryllium (Be)	mg/L	<0.000010	8318286	<0.000010	<0.000010	0.000010	8318286
Dissolved Bismuth (Bi)	mg/L	<0.0000050	8318286	<0.0000050	<0.0000050	0.0000050	8318286
Dissolved Boron (B)	mg/L	<0.010	8318286	<0.010	<0.010	0.010	8318286
Dissolved Cadmium (Cd)	mg/L	0.0000150	8318286	0.0000130	0.0000080	0.0000050	8318286
Dissolved Chromium (Cr)	mg/L	<0.00010	8318286	0.00012	0.00013	0.00010	8318286
Dissolved Cobalt (Co)	mg/L	0.0762	8318286	0.000435	0.000192	0.0000050	8318286
Dissolved Copper (Cu)	mg/L	0.000520	8318286	0.000867	0.000639	0.000050	8318286
Dissolved Iron (Fe)	mg/L	0.0017	8318286	0.0677	0.0381	0.0010	8318286
Dissolved Lead (Pb)	mg/L	0.0000060	8318286	0.0000170	0.0000310	0.0000050	8318286
Dissolved Lithium (Li)	mg/L	0.0197	8318286	0.0111	0.00554	0.00050	8318286
Dissolved Manganese (Mn)	mg/L	0.000131	8318286	0.0747	0.0335	0.000050	8318286
Dissolved Molybdenum (Mo)	mg/L	0.000143	8318286	0.00301	0.00159	0.000050	8318286
Dissolved Nickel (Ni)	mg/L	0.000212	8318286	0.00171	0.000928	0.000020	8318286
Dissolved Phosphorus (P)	mg/L	0.0041	8318286	0.0101	0.0096	0.0020	8318286
Dissolved Selenium (Se)	mg/L	0.0143	8318286	0.00214	0.00115	0.000040	8318286
Dissolved Silicon (Si)	mg/L	4.67	8318286	5.32	3.91	0.050	8318286
Dissolved Silver (Ag)	mg/L	0.0000080	8318286	0.0000050	<0.0000050	0.0000050	8318286
Dissolved Strontium (Sr)	mg/L	0.383	8318286	0.303	0.231	0.000050	8318286
Dissolved Thallium (Tl)	mg/L	0.0000110	8344921	<0.0000020	<0.0000020	0.0000020	8373598
Dissolved Tin (Sn)	mg/L	<0.00020	8318286	<0.00020	<0.00020	0.00020	8318286
Dissolved Titanium (Ti)	mg/L	<0.00050	8318286	<0.00050	<0.00050	0.00050	8318286
Dissolved Uranium (U)	mg/L	0.000855	8318286	0.00238	0.00134	0.0000020	8318286
Dissolved Vanadium (V)	mg/L	<0.00020	8318286	0.00087	0.00058	0.00020	8318286
RDL = Reportable Detection Limit							

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		OY5565		OY5566	OY5567		
Sampling Date		2016/06/29 14:20		2016/06/30 10:15	2016/06/30 09:26		
COC Number		496620-01-01		496620-01-01	496620-01-01		
	UNITS	DUP-1	QC Batch	BC-1	BC-37	RDL	QC Batch
Dissolved Zinc (Zn)	mg/L	0.00300	8318286	0.00071	0.00056	0.00010	8318286
Dissolved Zirconium (Zr)	mg/L	<0.00010	8318286	0.00011	<0.00010	0.00010	8318286
Dissolved Calcium (Ca)	mg/L	69.2	8317326	65.4	43.3	0.050	8317326
Dissolved Magnesium (Mg)	mg/L	40.6	8317326	21.6	13.8	0.050	8317326
Dissolved Potassium (K)	mg/L	2.35	8317326	1.15	0.706	0.050	8317326
Dissolved Sodium (Na)	mg/L	10.6	8317326	3.54	2.44	0.050	8317326
Dissolved Sulphur (S)	mg/L	7.7	8317326	39.5	25.1	3.0	8317326
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		OY5568		OY5569	OY5570		
Sampling Date		2016/06/30 09:05		2016/07/02 12:15	2016/06/30 10:55		
COC Number		496620-01-01		496620-02-01	496620-02-01		
	UNITS	BC-53	QC Batch	TRIP BLANK	FIELD BLANK	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	168	8317196	<0.50	<0.50	0.50	8317196
Elements							
Dissolved Mercury (Hg)	mg/L	<0.0000020	8322417	<0.0000020	<0.0000020	0.0000020	8322417
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.0103	8318286	<0.00050	<0.00050	0.00050	8318286
Dissolved Antimony (Sb)	mg/L	0.00130	8318286	<0.000020	<0.000020	0.000020	8318286
Dissolved Arsenic (As)	mg/L	0.00240	8318286	<0.000020	<0.000020	0.000020	8318286
Dissolved Barium (Ba)	mg/L	0.0533	8318286	<0.000020	<0.000020	0.000020	8318286
Dissolved Beryllium (Be)	mg/L	<0.000010	8318286	<0.000010	<0.000010	0.000010	8318286
Dissolved Bismuth (Bi)	mg/L	<0.0000050	8318286	<0.0000050	<0.0000050	0.0000050	8318286
Dissolved Boron (B)	mg/L	<0.010	8318286	<0.010	<0.010	0.010	8318286
Dissolved Cadmium (Cd)	mg/L	0.0000130	8318286	<0.0000050	<0.0000050	0.0000050	8318286
Dissolved Chromium (Cr)	mg/L	0.00012	8318286	<0.00010	<0.00010	0.00010	8318286
Dissolved Cobalt (Co)	mg/L	0.000193	8318286	<0.0000050	<0.0000050	0.0000050	8318286
Dissolved Copper (Cu)	mg/L	0.000625	8318286	<0.000050	<0.000050	0.000050	8318286
Dissolved Iron (Fe)	mg/L	0.0468	8318286	<0.0010	<0.0010	0.0010	8318286
Dissolved Lead (Pb)	mg/L	0.0000140	8318286	<0.0000050	<0.0000050	0.0000050	8318286
Dissolved Lithium (Li)	mg/L	0.00551	8318286	<0.00050	<0.00050	0.00050	8318286
Dissolved Manganese (Mn)	mg/L	0.0339	8318286	<0.000050	<0.000050	0.000050	8318286
Dissolved Molybdenum (Mo)	mg/L	0.00161	8318286	<0.000050	0.000091	0.000050	8318286
Dissolved Nickel (Ni)	mg/L	0.000910	8318286	<0.000020	<0.000020	0.000020	8318286
Dissolved Phosphorus (P)	mg/L	0.0100	8318286	<0.0020	0.0030	0.0020	8318286
Dissolved Selenium (Se)	mg/L	0.00114	8318286	<0.000040	<0.000040	0.000040	8318286
Dissolved Silicon (Si)	mg/L	3.92	8318286	<0.050	<0.050	0.050	8318286
Dissolved Silver (Ag)	mg/L	<0.0000050	8318286	<0.0000050	<0.0000050	0.0000050	8318286
Dissolved Strontium (Sr)	mg/L	0.236	8318286	<0.000050	<0.000050	0.000050	8318286
Dissolved Thallium (Tl)	mg/L	<0.0000020	8376553	<0.0000020	<0.0000020	0.0000020	8318286
Dissolved Tin (Sn)	mg/L	<0.00020	8318286	<0.00020	<0.00020	0.00020	8318286
Dissolved Titanium (Ti)	mg/L	<0.00050	8318286	<0.00050	<0.00050	0.00050	8318286
Dissolved Uranium (U)	mg/L	0.00137	8318286	<0.0000020	<0.0000020	0.0000020	8318286
Dissolved Vanadium (V)	mg/L	0.00061	8318286	<0.00020	<0.00020	0.00020	8318286
RDL = Reportable Detection Limit							

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		OY5568		OY5569	OY5570		
Sampling Date		2016/06/30 09:05		2016/07/02 12:15	2016/06/30 10:55		
COC Number		496620-01-01		496620-02-01	496620-02-01		
	UNITS	**BC-53**	**QC Batch**	**TRIP BLANK**	**FIELD BLANK**	**RDL**	**QC Batch**
Dissolved Zinc (Zn)	mg/L	0.00054	8318286	<0.00010	0.00014	0.00010	8318286
Dissolved Zirconium (Zr)	mg/L	<0.00010	8318286	<0.00010	<0.00010	0.00010	8318286
Dissolved Calcium (Ca)	mg/L	44.8	8317326	<0.050	<0.050	0.050	8317326
Dissolved Magnesium (Mg)	mg/L	13.7	8317326	<0.050	<0.050	0.050	8317326
Dissolved Potassium (K)	mg/L	0.698	8317326	<0.050	<0.050	0.050	8317326
Dissolved Sodium (Na)	mg/L	2.52	8317326	<0.050	<0.050	0.050	8317326
Dissolved Sulphur (S)	mg/L	24.4	8317326	<3.0	<3.0	3.0	8317326
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		OY5561		OY5562		OY5563		
Sampling Date		2016/06/29 18:00		2016/06/29 17:36		2016/06/29 17:04		
COC Number		496620-01-01		496620-01-01		496620-01-01		
	UNITS	BC-28A	QC Batch	BC-28B	QC Batch	DUP-2	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	1300	8317195	1000	8317195	1300	0.50	8317195
Elements								
Total Mercury (Hg)	mg/L	0.0000470	8322378	0.0000214	8323791	0.0000469	0.0000020	8322378
Total Metals by ICPMS								
Total Aluminum (Al)	mg/L	0.0062	8318431	0.0705	8318431	0.0074	0.0025	8318431
Total Antimony (Sb)	mg/L	1.90	8318431	1.54	8318431	1.87	0.00010	8318431
Total Arsenic (As)	mg/L	0.319	8318431	0.197	8318431	0.301	0.00010	8318431
Total Barium (Ba)	mg/L	0.0428	8318431	0.0320	8318431	0.0423	0.00010	8318431
Total Beryllium (Be)	mg/L	<0.000050	8318431	<0.000050	8318431	<0.000050	0.000050	8318431
Total Bismuth (Bi)	mg/L	<0.000025	8318431	<0.000025	8318431	<0.000025	0.000025	8318431
Total Boron (B)	mg/L	<0.050	8318431	<0.050	8318431	<0.050	0.050	8318431
Total Cadmium (Cd)	mg/L	0.000331	8318431	<0.000025	8318431	0.000343	0.000025	8318431
Total Chromium (Cr)	mg/L	<0.00050	8318431	<0.00050	8318431	<0.00050	0.00050	8318431
Total Cobalt (Co)	mg/L	0.729	8318431	0.476	8318431	0.698	0.000025	8318431
Total Copper (Cu)	mg/L	0.00149	8318431	0.00188	8318431	0.00137	0.00025	8318431
Total Iron (Fe)	mg/L	0.224	8318431	0.0192	8318431	0.199	0.0050	8318431
Total Lead (Pb)	mg/L	<0.000025	8318431	<0.000025	8318431	<0.000025	0.000025	8318431
Total Lithium (Li)	mg/L	0.0051	8318431	0.0035	8318431	0.0052	0.0025	8318431
Total Manganese (Mn)	mg/L	0.0270	8318431	0.0171	8318431	0.0256	0.00025	8318431
Total Molybdenum (Mo)	mg/L	0.0196	8318431	0.0192	8318431	0.0190	0.00025	8318431
Total Nickel (Ni)	mg/L	0.00810	8318431	0.00492	8318431	0.00821	0.00010	8318431
Total Phosphorus (P)	mg/L	0.053	8318431	<0.010	8318431	0.058	0.010	8318431
Total Selenium (Se)	mg/L	0.196	8318431	0.138	8318431	0.189	0.00020	8318431
Total Silicon (Si)	mg/L	4.73	8318431	0.83	8318431	4.56	0.25	8318431
Total Silver (Ag)	mg/L	<0.000025	8318431	<0.000025	8318431	<0.000025	0.000025	8318431
Total Strontium (Sr)	mg/L	1.86	8318431	1.43	8318431	1.77	0.00025	8318431
Total Thallium (Tl)	mg/L	0.000217	8318431	0.000157	8318431	0.000215	0.000010	8318431
Total Tin (Sn)	mg/L	<0.0010	8318431	<0.0010	8318431	<0.0010	0.0010	8318431
Total Titanium (Ti)	mg/L	<0.0025	8318431	<0.0025	8318431	<0.0025	0.0025	8318431
Total Uranium (U)	mg/L	0.0237	8318431	0.0186	8318431	0.0234	0.000010	8318431
Total Vanadium (V)	mg/L	<0.0010	8318431	<0.0010	8318431	<0.0010	0.0010	8318431

RDL = Reportable Detection Limit

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		OY5561		OY5562		OY5563		
Sampling Date		2016/06/29 18:00		2016/06/29 17:36		2016/06/29 17:04		
COC Number		496620-01-01		496620-01-01		496620-01-01		
	UNITS	**BC-28A**	**QC Batch**	**BC-28B**	**QC Batch**	**DUP-2**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	0.0104	8318431	0.00055	8318431	0.0106	0.00050	8318431
Total Zirconium (Zr)	mg/L	<0.00050	8318431	<0.00050	8318431	<0.00050	0.00050	8318431
Total Calcium (Ca)	mg/L	393	8317327	291	8317327	400	0.25	8317327
Total Magnesium (Mg)	mg/L	76.1	8317327	67.2	8317327	73.5	0.25	8317327
Total Potassium (K)	mg/L	5.22	8317327	4.39	8317327	5.11	0.25	8317327
Total Sodium (Na)	mg/L	455	8317327	329	8317327	435	0.25	8317327
Total Sulphur (S)	mg/L	301	8317327	273	8317327	287	15	8317327
RDL = Reportable Detection Limit								

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		OY5569	OY5570		
Sampling Date		2016/07/02 12:15	2016/06/30 10:55		
COC Number		496620-02-01	496620-02-01		
	UNITS	TRIP BLANK	FIELD BLANK	RDL	QC Batch
Calculated Parameters					
Total Hardness (CaCO3)	mg/L	<0.50	<0.50	0.50	8317195
Elements					
Total Mercury (Hg)	mg/L	<0.0000020	<0.0000020	0.0000020	8322378
Total Metals by ICPMS					
Total Aluminum (Al)	mg/L	<0.00050	0.00050	0.00050	8318431
Total Antimony (Sb)	mg/L	<0.000020	<0.000020	0.000020	8318431
Total Arsenic (As)	mg/L	<0.000020	<0.000020	0.000020	8318431
Total Barium (Ba)	mg/L	<0.000020	<0.000020	0.000020	8318431
Total Beryllium (Be)	mg/L	<0.000010	<0.000010	0.000010	8318431
Total Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	0.0000050	8318431
Total Boron (B)	mg/L	<0.010	<0.010	0.010	8318431
Total Cadmium (Cd)	mg/L	<0.0000050	<0.0000050	0.0000050	8318431
Total Chromium (Cr)	mg/L	<0.00010	<0.00010	0.00010	8318431
Total Cobalt (Co)	mg/L	<0.0000050	<0.0000050	0.0000050	8318431
Total Copper (Cu)	mg/L	<0.000050	<0.000050	0.000050	8318431
Total Iron (Fe)	mg/L	<0.0010	<0.0010	0.0010	8318431
Total Lead (Pb)	mg/L	<0.0000050	<0.0000050	0.0000050	8318431
Total Lithium (Li)	mg/L	<0.00050	<0.00050	0.00050	8318431
Total Manganese (Mn)	mg/L	<0.000050	<0.000050	0.000050	8318431
Total Molybdenum (Mo)	mg/L	<0.000050	<0.000050	0.000050	8318431
Total Nickel (Ni)	mg/L	<0.000020	<0.000020	0.000020	8318431
Total Phosphorus (P)	mg/L	<0.0020	0.0033	0.0020	8318431
Total Selenium (Se)	mg/L	<0.000040	<0.000040	0.000040	8318431
Total Silicon (Si)	mg/L	<0.050	<0.050	0.050	8318431
Total Silver (Ag)	mg/L	<0.0000050	<0.0000050 (1)	0.0000050	8318431
Total Strontium (Sr)	mg/L	<0.000050	<0.000050	0.000050	8318431
Total Thallium (Tl)	mg/L	<0.0000020	<0.0000020	0.0000020	8318431
Total Tin (Sn)	mg/L	<0.00020	<0.00020	0.00020	8318431
Total Titanium (Ti)	mg/L	<0.00050	<0.00050	0.00050	8318431
Total Uranium (U)	mg/L	<0.0000020	<0.0000020	0.0000020	8318431

RDL = Reportable Detection Limit
(1) Matrix Spike outside acceptance criteria (10% of analytes failure allowed).

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		OY5569	OY5570		
Sampling Date		2016/07/02 12:15	2016/06/30 10:55		
COC Number		496620-02-01	496620-02-01		
	UNITS	TRIP BLANK	FIELD BLANK	RDL	QC Batch
Total Vanadium (V)	mg/L	<0.00020	<0.00020	0.00020	8318431
Total Zinc (Zn)	mg/L	<0.00010	0.00010	0.00010	8318431
Total Zirconium (Zr)	mg/L	<0.00010	<0.00010	0.00010	8318431
Total Calcium (Ca)	mg/L	<0.050	<0.050	0.050	8317327
Total Magnesium (Mg)	mg/L	<0.050	<0.050	0.050	8317327
Total Potassium (K)	mg/L	<0.050	<0.050	0.050	8317327
Total Sodium (Na)	mg/L	<0.050	<0.050	0.050	8317327
Total Sulphur (S)	mg/L	<3.0	<3.0	3.0	8317327
RDL = Reportable Detection Limit					

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		OY5566	OY5567	OY5568		
Sampling Date		2016/06/30 10:15	2016/06/30 09:26	2016/06/30 09:05		
COC Number		496620-01-01	496620-01-01	496620-01-01		
	UNITS	BC-1	BC-37	BC-53	RDL	QC Batch
Calculated Parameters						
Total Hardness (CaCO3)	mg/L	280	181	178	0.50	8317195
Elements						
Total Mercury (Hg)	mg/L	<0.0000020	<0.0000020	<0.0000020	0.0000020	8322378
Total Metals by ICPMS						
Total Aluminum (Al)	mg/L	3.79	1.77	1.08	0.0030	8318648
Total Antimony (Sb)	mg/L	0.00310	0.00155	0.00143	0.000050	8318648
Total Arsenic (As)	mg/L	0.0111	0.00473	0.00482	0.000020	8318648
Total Barium (Ba)	mg/L	0.266	0.123	0.113	0.00010	8318648
Total Beryllium (Be)	mg/L	0.000219	0.000073	0.000065	0.000010	8318648
Total Bismuth (Bi)	mg/L	0.000064	0.000020	<0.000020	0.000020	8318648
Total Boron (B)	mg/L	<0.050	<0.050	<0.050	0.050	8318648
Total Cadmium (Cd)	mg/L	0.000271	0.0000990	0.0000860	0.0000050	8318648
Total Chromium (Cr)	mg/L	0.00712	0.00219	0.00210	0.00050	8318648
Total Cobalt (Co)	mg/L	0.00422	0.00136	0.00127	0.000010	8318648
Total Copper (Cu)	mg/L	0.0134	0.00474	0.00421	0.00020	8318648
Total Iron (Fe)	mg/L	7.10	2.21	2.18	0.0050	8318648
Total Lead (Pb)	mg/L	0.00428	0.00136	0.00121	0.000050	8318648
Total Lithium (Li)	mg/L	0.0158	0.00711	0.00674	0.00050	8318648
Total Manganese (Mn)	mg/L	0.223	0.0786	0.0860	0.00010	8318648
Total Molybdenum (Mo)	mg/L	0.00265	0.00158	0.00161	0.000050	8318648
Total Nickel (Ni)	mg/L	0.0122	0.00410	0.00385	0.00010	8318648
Total Phosphorus (P)	mg/L	0.281	0.072	0.064	0.010	8318648
Total Selenium (Se)	mg/L	0.00247	0.00120	0.00116	0.000040	8318648
Total Silicon (Si)	mg/L	10.9	5.64	5.54	0.10	8318648
Total Silver (Ag)	mg/L	0.000069	0.000022	0.000018	0.000010	8318648
Total Strontium (Sr)	mg/L	0.347	0.250	0.243	0.000050	8318648
Total Thallium (Tl)	mg/L	0.0000290	0.0000130	0.0000130	0.0000020	8318648
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	0.00020	8318648
Total Titanium (Ti)	mg/L	0.104	0.0415	0.0437	0.0050	8318648
Total Uranium (U)	mg/L	0.00304	0.00159	0.00153	0.0000050	8318648
Total Vanadium (V)	mg/L	0.0139	0.00461	0.00449	0.00050	8318648
RDL = Reportable Detection Limit						

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		OY5566	OY5567	OY5568		
Sampling Date		2016/06/30 10:15	2016/06/30 09:26	2016/06/30 09:05		
COC Number		496620-01-01	496620-01-01	496620-01-01		
	UNITS	BC-1	BC-37	BC-53	RDL	QC Batch
Total Zinc (Zn)	mg/L	0.0330	0.0105	0.0096	0.0010	8318648
Total Zirconium (Zr)	mg/L	0.00066	0.00022	0.00024	0.00010	8318648
Total Calcium (Ca)	mg/L	70.7	47.7	47.2	0.25	8317327
Total Magnesium (Mg)	mg/L	25.0	15.0	14.5	0.25	8317327
Total Potassium (K)	mg/L	1.39	0.77	0.76	0.25	8317327
Total Sodium (Na)	mg/L	3.84	2.72	2.56	0.25	8317327
Total Sulphur (S)	mg/L	42	25	24	15	8317327
RDL = Reportable Detection Limit						

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5561
Sample ID: BC-28A
Matrix: Water

Collected: 2016/06/29
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8318431	N/A	2016/07/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
Total Suspended Solids-Low Level	BAL/BAL	8316914	2016/07/04	2016/07/05	Prabhleen Sodhi

Maxxam ID: OY5561 Dup
Sample ID: BC-28A
Matrix: Water

Collected: 2016/06/29
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova

Maxxam ID: OY5562
Sample ID: BC-28B
Matrix: Water

Collected: 2016/06/29
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8323791	2016/07/08	2016/07/08	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8318431	N/A	2016/07/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
Total Suspended Solids-Low Level	BAL/BAL	8316914	2016/07/04	2016/07/05	Prabhleen Sodhi

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5563
Sample ID: DUP-2
Matrix: Water

Collected: 2016/06/29
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8318431	N/A	2016/07/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
Total Suspended Solids-Low Level	BAL/BAL	8316914	2016/07/04	2016/07/05	Prabhleen Sodhi

Maxxam ID: OY5564
Sample ID: BC-66
Matrix: Water

Collected: 2016/06/29
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8318790	N/A	2016/07/04	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/07	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/07	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz
Total Suspended Solids-Low Level	BAL/BAL	8316914	2016/07/04	2016/07/05	Prabhleen Sodhi

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5565
Sample ID: DUP-1
Matrix: Water

Collected: 2016/06/29
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8320245	N/A	2016/07/05	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/06	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/06	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/06	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/06	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz
Total Suspended Solids-Low Level	BAL/BAL	8316914	2016/07/04	2016/07/05	Prabhleen Sodhi

Maxxam ID: OY5566
Sample ID: BC-1
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8318790	N/A	2016/07/04	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/06	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/06	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/06	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8318648	2016/07/04	2016/07/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5566
Sample ID: BC-1
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8317171	2016/07/02	2016/07/04	Prabhleen Sodhi
Total Suspended Solids-Low Level	BAL/BAL	8319275	2016/07/05	2016/07/06	Wendy Fong

Maxxam ID: OY5566 Dup
Sample ID: BC-1
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean

Maxxam ID: OY5567
Sample ID: BC-37
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8318790	N/A	2016/07/04	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/06	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/06	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/06	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8318648	2016/07/04	2016/07/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5567
Sample ID: BC-37
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8317171	2016/07/02	2016/07/04	Prabhleen Sodhi
Total Suspended Solids-Low Level	BAL/BAL	8319275	2016/07/05	2016/07/06	Wendy Fong

Maxxam ID: OY5568
Sample ID: BC-53
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8318790	N/A	2016/07/04	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/06	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/06	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/06	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8318648	2016/07/04	2016/07/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8319465	2016/07/05	2016/07/06	Wendy Fong
Total Suspended Solids-Low Level	BAL/BAL	8319275	2016/07/05	2016/07/06	Wendy Fong

Maxxam ID: OY5569
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2016/07/02
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8318790	N/A	2016/07/04	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/07	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5569
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2016/07/02
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/06	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/06	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/06	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/06	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8318431	N/A	2016/07/06	Andrew An
Ammonia-N (Unpreserved)	KONE/COL	8318610	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8317868	2016/07/04	2016/07/05	Prabhleen Sodhi
Total Suspended Solids-Low Level	BAL/BAL	8319275	2016/07/05	2016/07/06	Wendy Fong

Maxxam ID: OY5569 Dup
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2016/07/02
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Ammonia-N (Unpreserved)	KONE/COL	8318610	N/A	2016/07/04	Clare Kwok

Maxxam ID: OY5570
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8317343	2016/07/02	2016/07/02	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8318790	N/A	2016/07/04	Diana Cruz
Cyanide SAD (strong acid dissociable)	TECH/COL	8321174	N/A	2016/07/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8321176	N/A	2016/07/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8317342	N/A	2016/07/02	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8317195	N/A	2016/07/06	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8317196	N/A	2016/07/06	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8322417	N/A	2016/07/07	Rob Mcclelland
Mercury (Total-LowLevel) by CVAF	CV/AF	8322378	2016/07/07	2016/07/07	Rob Mcclelland
Ion Balance	CALC	8317220	N/A	2016/07/06	Automated Statchk
Sum of cations, anions	CALC	8317221	N/A	2016/07/06	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8317326	N/A	2016/07/06	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: OY5570
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8317327	N/A	2016/07/06	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8318431	N/A	2016/07/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8318609	N/A	2016/07/04	Clare Kwok
Nitrate+Nitrite (N) (low level)	TRAA/COL	8317403	N/A	2016/07/02	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8317405	N/A	2016/07/02	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8317251	N/A	2016/07/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/07/02	Terry Shore
pH Water	AT/ALK	8317341	N/A	2016/07/02	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8318793	N/A	2016/07/04	Diana Cruz
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8317868	2016/07/04	2016/07/05	Prabhleen Sodhi
Total Suspended Solids-Low Level	BAL/BAL	8319275	2016/07/05	2016/07/06	Wendy Fong

Maxxam ID: OY5570 Dup
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8318286	N/A	2016/07/06	Andrew An
Elements by ICPMS Low Level (total)	ICP/CRCM	8318431	N/A	2016/07/06	Andrew An

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.7°C
Package 2	1.3°C

Revised Report V3 (M_S, 2016/09/12): Report includes revised results for Dissolved Thallium on samples DUP-1, BC-1, BC-37, and BC-53.

Sample OY5566-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample OY5567-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample OY5568-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample OY5569-01 : Ion Balance: NC = Not Calculable due to low ion sum [< 0.4 meq/L].

Sample OY5570-01 : Ion Balance: NC = Not Calculable due to low ion sum [< 0.4 meq/L].

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER) Comments

Sample OY5561-03 Elements by ICPMS Low Level (dissolved): RDL raised due to sample matrix interference.
Sample OY5562-03 Elements by ICPMS Low Level (dissolved): RDL raised due to sample matrix interference.
Sample OY5563-03 Elements by ICPMS Low Level (dissolved): RDL raised due to sample matrix interference.

LOW LEVEL TOTAL METALS WITH CV HG (WATER) Comments

Sample OY5561-02 Elements by ICPMS Low Level (total): RDL raised due to sample matrix interference.
Sample OY5562-02 Elements by ICPMS Low Level (total): RDL raised due to sample matrix interference.
Sample OY5563-02 Elements by ICPMS Low Level (total): RDL raised due to sample matrix interference.

Sample OY5565, Elements by ICPMS Low Level (dissolved): Test repeated.
Sample OY5566, Elements by ICPMS Low Level (dissolved): Test repeated.
Sample OY5567, Elements by ICPMS Low Level (dissolved): Test repeated.
Sample OY5568, Elements by ICPMS Low Level (dissolved): Test repeated.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

QUALITY ASSURANCE REPORT

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8316914	Total Suspended Solids	2016/07/05			98	80 - 120	<1.0	mg/L		
8317171	Total Dissolved Solids	2016/07/04	NC	80 - 120	94	80 - 120	12, RDL=10	mg/L	NC	20
8317341	pH	2016/07/02			102	97 - 103			0.36	N/A
8317342	Conductivity	2016/07/02			101	80 - 120	<1.0	uS/cm	0	20
8317343	Alkalinity (PP as CaCO3)	2016/07/02					<0.50	mg/L	NC	20
8317343	Alkalinity (Total as CaCO3)	2016/07/02	NC	80 - 120	101	80 - 120	0.54, RDL=0.50	mg/L	0.18	20
8317343	Bicarbonate (HCO3)	2016/07/02					0.66, RDL=0.50	mg/L	0.18	20
8317343	Carbonate (CO3)	2016/07/02					<0.50	mg/L	NC	20
8317343	Hydroxide (OH)	2016/07/02					<0.50	mg/L	NC	20
8317403	Nitrate plus Nitrite (N)	2016/07/02	103	80 - 120	100	80 - 120	<0.0020	mg/L	0.28	25
8317405	Nitrite (N)	2016/07/02	100	80 - 120	97	80 - 120	<0.0020	mg/L	NC	25
8317868	Total Dissolved Solids	2016/07/05	102	80 - 120	102	80 - 120	<10	mg/L	2.2	20
8318286	Dissolved Aluminum (Al)	2016/07/06	107	80 - 120	110	80 - 120	<0.00050	mg/L	NC	20
8318286	Dissolved Antimony (Sb)	2016/07/06	99	80 - 120	98	80 - 120	<0.000020	mg/L	NC	20
8318286	Dissolved Arsenic (As)	2016/07/06	102	80 - 120	104	80 - 120	<0.000020	mg/L	NC	20
8318286	Dissolved Barium (Ba)	2016/07/06	100	80 - 120	102	80 - 120	<0.000020	mg/L	NC	20
8318286	Dissolved Beryllium (Be)	2016/07/06	98	80 - 120	97	80 - 120	<0.000010	mg/L	NC	20
8318286	Dissolved Bismuth (Bi)	2016/07/06	97	80 - 120	107	80 - 120	<0.0000050	mg/L	NC	20
8318286	Dissolved Boron (B)	2016/07/06	97	80 - 120	95	80 - 120	<0.010	mg/L	NC	20
8318286	Dissolved Cadmium (Cd)	2016/07/06	101	80 - 120	104	80 - 120	<0.0000050	mg/L	NC	20
8318286	Dissolved Chromium (Cr)	2016/07/06	99	80 - 120	103	80 - 120	<0.00010	mg/L	NC	20
8318286	Dissolved Cobalt (Co)	2016/07/06	102	80 - 120	105	80 - 120	<0.0000050	mg/L	NC	20
8318286	Dissolved Copper (Cu)	2016/07/06	102	80 - 120	105	80 - 120	<0.000050	mg/L	NC	20
8318286	Dissolved Iron (Fe)	2016/07/06	105	80 - 120	107	80 - 120	<0.0010	mg/L	NC	20
8318286	Dissolved Lead (Pb)	2016/07/06	99	80 - 120	105	80 - 120	0.0000060, RDL=0.0000050	mg/L	NC	20
8318286	Dissolved Lithium (Li)	2016/07/06	98	80 - 120	100	80 - 120	<0.00050	mg/L	NC	20
8318286	Dissolved Manganese (Mn)	2016/07/06	100	80 - 120	106	80 - 120	<0.000050	mg/L	NC	20
8318286	Dissolved Molybdenum (Mo)	2016/07/06	97	80 - 120	99	80 - 120	<0.000050	mg/L	NC	20
8318286	Dissolved Nickel (Ni)	2016/07/06	102	80 - 120	105	80 - 120	<0.000020	mg/L	NC	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8318286	Dissolved Phosphorus (P)	2016/07/06					0.0031, RDL=0.0020	mg/L	NC	20
8318286	Dissolved Selenium (Se)	2016/07/06	103	80 - 120	104	80 - 120	<0.000040	mg/L	NC	20
8318286	Dissolved Silicon (Si)	2016/07/06					<0.050	mg/L	NC	20
8318286	Dissolved Silver (Ag)	2016/07/06	101	80 - 120	97	80 - 120	<0.0000050	mg/L	NC	20
8318286	Dissolved Strontium (Sr)	2016/07/06	98	80 - 120	102	80 - 120	<0.000050	mg/L	NC	20
8318286	Dissolved Thallium (Tl)	2016/07/06	94	80 - 120	104	80 - 120	0.0000030, RDL=0.0000020	mg/L	NC	20
8318286	Dissolved Tin (Sn)	2016/07/06	100	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20
8318286	Dissolved Titanium (Ti)	2016/07/06	97	80 - 120	93	80 - 120	<0.00050	mg/L	NC	20
8318286	Dissolved Uranium (U)	2016/07/06	96	80 - 120	105	80 - 120	<0.0000020	mg/L	NC	20
8318286	Dissolved Vanadium (V)	2016/07/06	100	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20
8318286	Dissolved Zinc (Zn)	2016/07/06	104	80 - 120	108	80 - 120	<0.00010	mg/L	NC	20
8318286	Dissolved Zirconium (Zr)	2016/07/06					<0.00010	mg/L	NC	20
8318431	Total Aluminum (Al)	2016/07/06	105	80 - 120	106	80 - 120	<0.00050	mg/L	NC	20
8318431	Total Antimony (Sb)	2016/07/06	101	80 - 120	94	80 - 120	<0.000020	mg/L	NC	20
8318431	Total Arsenic (As)	2016/07/06	102	80 - 120	93	80 - 120	<0.000020	mg/L	NC	20
8318431	Total Barium (Ba)	2016/07/06	100	80 - 120	99	80 - 120	<0.000020	mg/L	NC	20
8318431	Total Beryllium (Be)	2016/07/06	98	80 - 120	104	80 - 120	<0.000010	mg/L	NC	20
8318431	Total Bismuth (Bi)	2016/07/06	99	80 - 120	100	80 - 120	<0.0000050	mg/L	NC	20
8318431	Total Boron (B)	2016/07/06	97	80 - 120	112	80 - 120	<0.010	mg/L	NC	20
8318431	Total Cadmium (Cd)	2016/07/06	104	80 - 120	96	80 - 120	<0.0000050	mg/L	NC	20
8318431	Total Chromium (Cr)	2016/07/06	100	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
8318431	Total Cobalt (Co)	2016/07/06	101	80 - 120	102	80 - 120	<0.0000050	mg/L	NC	20
8318431	Total Copper (Cu)	2016/07/06	101	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8318431	Total Iron (Fe)	2016/07/06	106	80 - 120	104	80 - 120	<0.0010	mg/L	NC	20
8318431	Total Lead (Pb)	2016/07/06	102	80 - 120	101	80 - 120	<0.0000050	mg/L	NC	20
8318431	Total Lithium (Li)	2016/07/06	98	80 - 120	102	80 - 120	<0.00050	mg/L	NC	20
8318431	Total Manganese (Mn)	2016/07/06	100	80 - 120	103	80 - 120	<0.000050	mg/L	NC	20
8318431	Total Molybdenum (Mo)	2016/07/06	97	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8318431	Total Nickel (Ni)	2016/07/06	100	80 - 120	100	80 - 120	<0.000020	mg/L	NC	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8318431	Total Phosphorus (P)	2016/07/06					0.0037, RDL=0.0020	mg/L	NC	20
8318431	Total Selenium (Se)	2016/07/06	105	80 - 120	96	80 - 120	<0.000040	mg/L	NC	20
8318431	Total Silicon (Si)	2016/07/06					<0.050	mg/L	NC	20
8318431	Total Silver (Ag)	2016/07/06	76 (1)	80 - 120	107	80 - 120	<0.0000050	mg/L	NC	20
8318431	Total Strontium (Sr)	2016/07/06	99	80 - 120	100	80 - 120	<0.000050	mg/L	NC	20
8318431	Total Thallium (Tl)	2016/07/06	91	80 - 120	104	80 - 120	<0.0000020	mg/L	NC	20
8318431	Total Tin (Sn)	2016/07/06	104	80 - 120	105	80 - 120	<0.00020	mg/L	NC	20
8318431	Total Titanium (Ti)	2016/07/06	98	80 - 120	107	80 - 120	<0.00050	mg/L	NC	20
8318431	Total Uranium (U)	2016/07/06	100	80 - 120	102	80 - 120	<0.0000020	mg/L	NC	20
8318431	Total Vanadium (V)	2016/07/06	100	80 - 120	117	80 - 120	<0.00020	mg/L	NC	20
8318431	Total Zinc (Zn)	2016/07/06	108	80 - 120	87	80 - 120	<0.00010	mg/L	NC	20
8318431	Total Zirconium (Zr)	2016/07/06					<0.00010	mg/L	NC	20
8318609	Total Ammonia (N)	2016/07/04	NC	80 - 120	102	80 - 120	<0.0050	mg/L	3.0	20
8318610	Total Ammonia (N)	2016/07/04	104	80 - 120	102	80 - 120	<0.0050	mg/L	NC	20
8318648	Total Aluminum (Al)	2016/07/05	NC	80 - 120	108	80 - 120	<0.0030	mg/L		
8318648	Total Antimony (Sb)	2016/07/05	110	80 - 120	107	80 - 120	<0.000050	mg/L		
8318648	Total Arsenic (As)	2016/07/05	111	80 - 120	106	80 - 120	<0.000020	mg/L		
8318648	Total Barium (Ba)	2016/07/05	NC	80 - 120	103	80 - 120	<0.00010	mg/L		
8318648	Total Beryllium (Be)	2016/07/05	106	80 - 120	99	80 - 120	<0.000010	mg/L		
8318648	Total Bismuth (Bi)	2016/07/05	102	80 - 120	105	80 - 120	<0.000020	mg/L	NC	20
8318648	Total Boron (B)	2016/07/05	NC	80 - 120	90	80 - 120	<0.050	mg/L		
8318648	Total Cadmium (Cd)	2016/07/05	110	80 - 120	109	80 - 120	<0.0000050	mg/L		
8318648	Total Chromium (Cr)	2016/07/05	NC	80 - 120	102	80 - 120	<0.00050	mg/L		
8318648	Total Cobalt (Co)	2016/07/05	110	80 - 120	101	80 - 120	<0.000010	mg/L		
8318648	Total Copper (Cu)	2016/07/05	102	80 - 120	105	80 - 120	<0.00020	mg/L		
8318648	Total Iron (Fe)	2016/07/05	NC	80 - 120	110	80 - 120	<0.0050	mg/L		
8318648	Total Lead (Pb)	2016/07/05	106	80 - 120	104	80 - 120	<0.000050	mg/L		
8318648	Total Lithium (Li)	2016/07/05	NC	80 - 120	111	80 - 120	<0.00050	mg/L		
8318648	Total Manganese (Mn)	2016/07/05	NC	80 - 120	103	80 - 120	<0.00010	mg/L		
8318648	Total Molybdenum (Mo)	2016/07/05	NC	80 - 120	101	80 - 120	<0.000050	mg/L		

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8318648	Total Nickel (Ni)	2016/07/05	NC	80 - 120	100	80 - 120	<0.00010	mg/L		
8318648	Total Phosphorus (P)	2016/07/05					<0.010	mg/L		
8318648	Total Selenium (Se)	2016/07/05	NC	80 - 120	109	80 - 120	<0.000040	mg/L		
8318648	Total Silicon (Si)	2016/07/05					<0.10	mg/L		
8318648	Total Silver (Ag)	2016/07/05	94	80 - 120	103	80 - 120	<0.000010	mg/L		
8318648	Total Strontium (Sr)	2016/07/05	NC	80 - 120	101	80 - 120	<0.000050	mg/L		
8318648	Total Thallium (Tl)	2016/07/05	83	80 - 120	84	80 - 120	<0.0000020	mg/L		
8318648	Total Tin (Sn)	2016/07/05	112	80 - 120	104	80 - 120	<0.00020	mg/L		
8318648	Total Titanium (Ti)	2016/07/05	108	80 - 120	102	80 - 120	<0.0050	mg/L		
8318648	Total Uranium (U)	2016/07/05	NC	80 - 120	103	80 - 120	<0.0000050	mg/L		
8318648	Total Vanadium (V)	2016/07/05	NC	80 - 120	101	80 - 120	<0.00050	mg/L		
8318648	Total Zinc (Zn)	2016/07/05	112	80 - 120	115	80 - 120	<0.0010	mg/L		
8318648	Total Zirconium (Zr)	2016/07/05					<0.00010	mg/L		
8318790	Dissolved Chloride (Cl)	2016/07/04	NC	80 - 120	99	80 - 120	<0.50	mg/L	0.76	20
8318793	Dissolved Sulphate (SO4)	2016/07/04	93	80 - 120	90	80 - 120	<0.50	mg/L	NC	20
8319275	Total Suspended Solids	2016/07/06			101	80 - 120	<1.0	mg/L		
8319465	Total Dissolved Solids	2016/07/06	NC	80 - 120	90	80 - 120	<10	mg/L	2.9	20
8320245	Dissolved Chloride (Cl)	2016/07/05			98	80 - 120	0.68, RDL=0.50	mg/L		
8321174	Strong Acid Dissoc. Cyanide (CN)	2016/07/06	106	80 - 120	102	80 - 120	<0.00050	mg/L	1.1	20
8321176	Weak Acid Dissoc. Cyanide (CN)	2016/07/06	93	80 - 120	100	80 - 120	<0.00050	mg/L	0.59	20
8322378	Total Mercury (Hg)	2016/07/07	109	80 - 120	102	80 - 120	<0.0000020	mg/L	NC	20
8322417	Dissolved Mercury (Hg)	2016/07/07	98	80 - 120	99	80 - 120	<0.0000020	mg/L	NC	20
8323791	Total Mercury (Hg)	2016/07/08	93	80 - 120	93	80 - 120	<0.0000020	mg/L	NC	20
8344921	Dissolved Thallium (Tl)	2016/08/03			105	80 - 120	<0.0000020	mg/L		
8373598	Dissolved Thallium (Tl)	2016/08/23	99	80 - 120	105	80 - 120	<0.0000020	mg/L		

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8376553	Dissolved Thallium (Tl)	2016/08/25			101	80 - 120	<0.0000020	mg/L		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

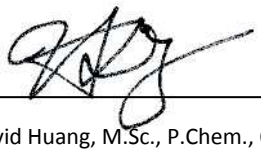
Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B653528
Report Date: 2016/09/12

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: GOLDEN PREDATOR
Sampler Initials: AB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Analytics International Corporation o/a Maxxam Analytics
4606 Canada Way, Burnaby, British Columbia Canada V5G 1K5 Tel:(604) 734 7276 Toll-Free:800-563-6266 Fax:(604) 731 2386 www.maxxam.ca

B653528_COC

Page 1 of 2

INVOICE TO:

Company Name: #3429 Alexco Environmental Group Inc.
Contact Name: Accounts Payable
Address: Unit 3 Calcite Business Centre 151 Industrial Road
WHITEHORSE YT Y1A 2V3
Phone: (867) 668-6463 Fax: (867) 667-6680
Email: ap@accessconsulting.ca

Report Information

Company Name: Alexco Environmental Group.
Contact Name: Scott Keesey, Kai Woloshyn
Address:
Phone: Fax:
Email: scott@accessconsulting.ca kwoloshyn@alexcoenvironmental.com

Project Information

Quotation #: B50901
P.O. #:
Project #: GPBC-13-01
Project Name: Golden Predator.
Site #:
Sampled By: Anthony Bier/Annina Althaer

Bottle Order #: 496620

Chain Of Custody Record: C#496620-01-01

Project Manager: Morgan Melnychuk

Regulatory Criteria:

Special Instructions:

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	LLI Total and Dissolved Metals with CV Hg, TSS, LL Ammonia, CN (SAD & WAD)	LL D-Metals with CV Hg, pH, EC, Alk, Cl, SO4, NO3, NH4, TSS, CN (SAD/WAD)	LL T & D Metals w/CV Hg, pH, EC, Alk, Cl, So4, No3, NH4, TSS, TDS, CN (SAD/WAD)	# of Bottles	Comments
1	SID#155576	~~BC-28~~ ~~Dup~~										
2	SID#155577	BC-28A	29/06/16	18:00	Water	N	Y	X			9	
3	SID#155578	BC-28B	29/06/16	17:36	Water	N	Y	X			9	
4	SID#155579	Dup-2	29/06/16	17:04	Water	N	Y	X			9	
5	SID#155580	~~BC-65~~										
6	SID#155581	BC-66	29/06/16	16:40	Water	N	Y		X		7	
7	SID#155582	Dup-1	29/06/16	14:20	Water	N	Y		X		7	
8	SID#155583	BC-1	30/06/16	1015h	Water	N	Y			X		
9	SID#155584	BC-37	30/06/16	0926h	Water	N	Y			X		
10	SID#155585	BC-53	30/06/16	0905h	Water	N	Y			X		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
A Bier / Anthony Bier	30/06/16/06/30	18:30	Ron Mapue	2016/07/02	12:15		☐	1,2,2 / 1,1,2	☐ Yes ☒ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
4606 Canada Way, Burnaby, British Columbia Canada V5G 1K5 Tel:(604) 734 7276 Toll-Free:800-563-6266 Fax:(604) 731 2386 www.maxxam.ca

B653528_COC

C#496620-02-01

Bottle Order #: 496620

Project Manager: Morgan Meinychuk

INVOICE TO:		Report Information		Project Information	
Company Name	#3429 Alexco Environmental Group Inc.	Company Name	Nichole Spence	Quotation #	B50901
Contact Name	Accounts Payable	Contact Name	~~Scott Keesey~~ Kai Woloshyn.	P.O. #	
Address	Unit 3 Calcite Business Centre 151 Industrial Road WHITEHORSE YT Y1A 2V3	Address	kwoloshyn@alexcoenvironmental.com.	Project #	GPBC-13-01
Phone	(867) 668-6463 Fax: (867) 667-6680	Phone	Fax:	Project Name	Golden Predator
Email	ap@accessconsulting.ca	Email	~~scott@accessconsulting.ca~~	Site #	N/A
				Sampled By	A. Bier, A. Allhorn.

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y / N)	Metals Field Filtered? (Y / N)	LLI Total and Dissolved Metals with CV Hg, TSS Ammonia, CN (SAD & WAD)	LL D-Metals with CV Hg, pH, EC, Alk, Cl, SO4, NO3, NH4, TSS, CN (SAD/WAD)	LLT & D Metals w/CV Hg, pH, EC, Alk, Cl, So4, No3, NH4, TSS, TDS, CN (SAD/WAD)	# of Bottles	Comments
1	SID#155586	TRIP BLANK	N/A	N/A	H_2O	N	N			X	9	
2		FIELD BLANK	30/06/16	1055h	H_2O					X	9	
3												
4												
5												
6												
7												
8												
9												
10												

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
A Bier / Anthony Bier.	16/06/30	18:30	Ron Napier	2016/07/02	12:15	

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
☐	6.2/6.2	☐ Yes ☒ N/A ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: GPBC-13-01
Site Location: BREWERY CREEK

Attention:Scott Keesey

Alexco Environmental Group Inc.
Unit 3 Calcite Business Centre
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 2V3

Your C.O.C. #: 08427984, 08427985, 08427986, 08427987, 08427988

Report Date: 2016/10/07
Report #: R2278233
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B686620
Received: 2016/09/30, 16:15

Sample Matrix: Water
Samples Received: 28

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	25	2016/10/04	2016/10/04	BBY6SOP-00026	SM 22 2320 B m
Chloride by Automated Colourimetry	21	N/A	2016/10/04	BBY6SOP-00011	SM 22 4500-Cl- E m
Cyanide SAD (strong acid dissociable)	21	N/A	2016/10/05	BBY6SOP-00004	SM 22 4500-CN O m
Cyanide WAD (weak acid dissociable)	21	N/A	2016/10/05	BBY6SOP-00004	SM 22 4500-CN O m
Conductance - water	25	N/A	2016/10/04	BBY6SOP-00026	SM 22 2510 B m
Hardness Total (calculated as CaCO3)	20	N/A	2016/10/05	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	27	N/A	2016/10/05	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	1	N/A	2016/10/06	BBY WI-00033	Auto Calc
Mercury (Dissolved-LowLevel) by CVAF	28	N/A	2016/10/05	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Mercury (Total-LowLevel) by CVAF	20	2016/10/04	2016/10/04	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Ion Balance	20	N/A	2016/10/05	BBY WI-00033	Auto Calc
Ion Balance	1	N/A	2016/10/06	BBY WI-00033	Auto Calc
Sum of cations, anions	20	N/A	2016/10/05	Calc	
Sum of cations, anions	1	N/A	2016/10/06	Calc	
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	27	N/A	2016/10/05	BBY7SOP-00002	EPA 6020B R2 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2016/10/06	BBY7SOP-00002	EPA 6020B R2 m
Elements by ICPMS Low Level (dissolved)	28	N/A	2016/10/05	BBY7SOP-00002	EPA 6020B R2 m
Elements by ICPMS Digested LL (total)	10	2016/10/04	2016/10/05	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Na, K, Ca, Mg, S by CRC ICPMS (total)	20	N/A	2016/10/05	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Elements by ICPMS Low Level (total)	10	N/A	2016/10/04	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Ammonia-N (Preserved)	28	N/A	2016/10/05	BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate + Nitrite (N)	25	N/A	2016/10/04	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) by CFA	25	N/A	2016/10/04	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	25	N/A	2016/10/05	BBY6SOP-00010	SM 22 4500-NO3 I m
Filter and HNO3 Preserve for Metals	20	N/A	2016/10/04	BBY7 WI-00004	BCMOE Reqs 08/14
Filter and HNO3 Preserve for Metals	7	N/A	2016/10/05	BBY7 WI-00004	BCMOE Reqs 08/14
pH Water (1)	25	N/A	2016/10/04	BBY6SOP-00026	SM 22 4500-H+ B m

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your Project #: GPBC-13-01
Site Location: BREWERY CREEK

Attention:Scott Keesey

Alexco Environmental Group Inc.
Unit 3 Calcite Business Centre
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 2V3

Your C.O.C. #: 08427984, 08427985, 08427986, 08427987, 08427988

Report Date: 2016/10/07
Report #: R2278233
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B686620
Received: 2016/09/30, 16:15

Sample Matrix: Water
Samples Received: 28

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sulphate by Automated Colourimetry	25	N/A	2016/10/04	BBY6SOP-00017	SM 22 4500-SO42- E m
Total Dissolved Solids (Filt. Residue)	25	2016/10/04	2016/10/05	BBY6SOP-00033	SM 22 2540 C m
Total Suspended Solids-Low Level	20	2016/10/04	2016/10/05	BBY6SOP-00034	SM 22 2540 D

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Megan Smith, Project Manager
Email: msmith@maxxam.ca
Phone# (604) 734 7276

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1130			PR1131		PR1132		
Sampling Date		2016/09/28 12:02			2016/09/30		2016/09/28 09:28		
COC Number		08427984			08427984		08427984		
	UNITS	BC-1 LP	RDL	QC Batch	TRIP BLANK LQTB	QC Batch	BC-6 LP	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	5.7	N/A	8425275	0.018	8420463	3.3	N/A	8420463
Cation Sum	meq/L	5.6	N/A	8425275	0.0032	8420463	3.1	N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	N/A	8421091		8421091	LAB	N/A	8421091
Ion Balance	N/A	0.99	0.010	8425274	0.18 (1)	8419995	0.95	0.010	8419995
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00056	0.00050	8423254	<0.00050	8423254	<0.00050	0.00050	8423254
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8423265	<0.00050	8423265	<0.00050	0.00050	8423265
Alkalinity (Total as CaCO3)	mg/L	132	0.50	8421860	<0.50	8421860	87.8	0.50	8421855
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8421860	<0.50	8421860	<0.50	0.50	8421855
Bicarbonate (HCO3)	mg/L	161	0.50	8421860	<0.50	8421860	107	0.50	8421855
Carbonate (CO3)	mg/L	<0.50	0.50	8421860	<0.50	8421860	<0.50	0.50	8421855
Hydroxide (OH)	mg/L	<0.50	0.50	8421860	<0.50	8421860	<0.50	0.50	8421855
Anions									
Dissolved Sulphate (SO4)	mg/L	143	0.50	8421625	0.86	8421635	73.7	0.50	8421625
Dissolved Chloride (Cl)	mg/L	1.2	0.50	8421622	<0.50	8421628	0.50	0.50	8421622
Nutrients									
Total Ammonia (N)	mg/L	0.033	0.0050	8423416	0.0065	8423416	0.010	0.0050	8423413
Physical Properties									
Conductivity	uS/cm	511	1.0	8421862	<1.0	8421862	311	1.0	8421857
pH	pH	8.09		8421861	5.56	8421861	7.96		8421856
Physical Properties									
Total Suspended Solids	mg/L	130 (2)	2.5	8420455	<1.0	8420455	2.2	1.0	8420455
Total Dissolved Solids	mg/L	352	10	8421092	<10	8421092	204	10	8421092

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Ion balance out of optimal range due to high measurement uncertainty at this level (Ion Sum < 0.4 meq/L for both cations and anions).

(2) RDL raised due to high concentration of solids in the sample.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1133	PR1134	PR1135			PR1136		
Sampling Date		2016/09/28 13:55	2016/09/28 16:24	2016/09/28 09:54			2016/09/27 17:53		
COC Number		08427984	08427984	08427984			08427984		
	UNITS	BC-31 LP	BC-34 LP	BC-39 LP	RDL	QC Batch	BC-51W LP	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	6.3	5.6	3.2	N/A	8420463	5.3	N/A	8420463
Cation Sum	meq/L	6.0	5.3	2.8	N/A	8420463	5.8	N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	LAB	LAB	N/A	8421091	LAB	N/A	8421091
Ion Balance	N/A	0.96	0.94	0.87	0.010	8419995	1.1	0.010	8419995
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00057	0.00054	<0.00050	0.00050	8423254	<0.00050	0.00050	8423254
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00055	0.00060	0.00050	8423265	0.00060	0.00050	8423265
Alkalinity (Total as CaCO3)	mg/L	161	135	90.4	0.50	8421855	<0.50	0.50	8421860
Alkalinity (PP as CaCO3)	mg/L	<0.50	<0.50	<0.50	0.50	8421855	<0.50	0.50	8421860
Bicarbonate (HCO3)	mg/L	197	165	110	0.50	8421855	<0.50	0.50	8421860
Carbonate (CO3)	mg/L	<0.50	<0.50	<0.50	0.50	8421855	<0.50	0.50	8421860
Hydroxide (OH)	mg/L	<0.50	<0.50	<0.50	0.50	8421855	<0.50	0.50	8421860
Anions									
Dissolved Sulphate (SO4)	mg/L	145	138	64.0	0.50	8421625	254 (1)	5.0	8421635
Dissolved Chloride (Cl)	mg/L	0.59	0.62	0.61	0.50	8421622	0.81	0.50	8421628
Nutrients									
Total Ammonia (N)	mg/L	0.019	0.0076	0.0067	0.0050	8423413	0.018	0.0050	8423413
Physical Properties									
Conductivity	uS/cm	565	504	289	1.0	8421857	664	1.0	8421862
pH	pH	8.17	8.13	7.68		8421856	3.63		8421861
Physical Properties									
Total Suspended Solids	mg/L	16.3	3.2	3.4	1.0	8420455	4.8 (2)	1.5	8420455
Total Dissolved Solids	mg/L	388	340	186	10	8421092	464	10	8421092

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) RDL raised due to limited initial sample amount.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1137	PR1138		PR1139		
Sampling Date		2016/09/28 10:45	2016/09/28		2016/09/30		
COC Number		08427984	08427984		08427984		
	UNITS	BC-53 LP	DUP C LQS	QC Batch	FIELD BLANK LQFB	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	5.6	5.5	8420463	0.013 (1)	N/A	8420463
Cation Sum	meq/L	5.3	5.2	8420463	0.0033	N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	LAB	8421091	LAB	N/A	8421091
Ion Balance	N/A	0.94	0.94	8419995	0.25	0.010	8419995
Misc. Inorganics							
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00060	0.00055	8423254	<0.00050	0.00050	8423254
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.00051	0.00062	8423265	<0.00050	0.00050	8423265
Alkalinity (Total as CaCO3)	mg/L	133	136	8421855	<0.50	0.50	8421860
Alkalinity (PP as CaCO3)	mg/L	<0.50	<0.50	8421855	<0.50	0.50	8421860
Bicarbonate (HCO3)	mg/L	162	166	8421855	<0.50	0.50	8421860
Carbonate (CO3)	mg/L	<0.50	<0.50	8421855	<0.50	0.50	8421860
Hydroxide (OH)	mg/L	<0.50	<0.50	8421855	<0.50	0.50	8421860
Anions							
Dissolved Sulphate (SO4)	mg/L	141	134	8421625	0.64	0.50	8421625
Dissolved Chloride (Cl)	mg/L	1.1	<0.50	8421622	<0.50	0.50	8421622
Nutrients							
Total Ammonia (N)	mg/L	0.037	0.0073	8423413	0.0068	0.0050	8423413
Physical Properties							
Conductivity	uS/cm	514	504	8421857	<1.0	1.0	8421862
pH	pH	8.11	8.13	8421856	5.55		8421861
Physical Properties							
Total Suspended Solids	mg/L	33.5	3.0	8420455	<1.0	1.0	8420455
Total Dissolved Solids	mg/L	354	334	8421346	<10	10	8421346

RDL = Reportable Detection Limit

N/A = Not Applicable

(1) Ion balance out of optimal range due to high measurement uncertainty at this level (Ion Sum < 0.4 meq/L for both cations and anions).

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1142		PR1143		PR1144		
Sampling Date		2016/09/27 13:15		2016/09/27 17:23		2016/09/27 14:30		
COC Number		08427985		08427985		08427985		
	UNITS	BC-19 LP	QC Batch	BC-21 LP	QC Batch	BC-22 LP	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	15	8420463	15	8420463	20	N/A	8420463
Cation Sum	meq/L	15	8420463	15	8420463	17	N/A	8420463
Filter and HNO3 Preservation	N/A	FIELD	ONSITE	LAB	8421091	FIELD	N/A	ONSITE
Ion Balance	N/A	0.96	8419995	0.95	8419995	0.86	0.010	8419995
Misc. Inorganics								
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8423254	<0.00050	8423254	<0.00050	0.00050	8423254
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8423265	<0.00050	8423265	<0.00050	0.00050	8423265
Alkalinity (Total as CaCO3)	mg/L	283	8421855	270	8421860	64.2	0.50	8421855
Alkalinity (PP as CaCO3)	mg/L	<0.50	8421855	<0.50	8421860	<0.50	0.50	8421855
Bicarbonate (HCO3)	mg/L	345	8421855	330	8421860	78.3	0.50	8421855
Carbonate (CO3)	mg/L	<0.50	8421855	<0.50	8421860	<0.50	0.50	8421855
Hydroxide (OH)	mg/L	<0.50	8421855	<0.50	8421860	<0.50	0.50	8421855
Anions								
Dissolved Sulphate (SO4)	mg/L	458 (1)	8421625	474 (1)	8421625	901 (1)	5.0	8421625
Dissolved Chloride (Cl)	mg/L	1.3	8421622	3.4	8421622	0.98	0.50	8421622
Nutrients								
Total Ammonia (N)	mg/L	0.018	8423413	0.17	8423413	0.027	0.0050	8423413
Physical Properties								
Conductivity	uS/cm	1250	8421857	1260	8421862	1510	1.0	8421857
pH	pH	7.20	8421856	7.38	8421861	5.89		8421856
Physical Properties								
Total Dissolved Solids	mg/L	928	8421346	916	8421346	1320	10	8421346

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1145			PR1146		PR1147		
Sampling Date		2016/09/29 10:04			2016/09/27 12:07		2016/09/29 13:38		
COC Number		08427985			08427985		08427985		
	UNITS	BC-27 LP	RDL	QC Batch	BC-66 LP	QC Batch	BC-67 LP	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	9.6	N/A	8420463	7.7	8420463	5.4	N/A	8420463
Cation Sum	meq/L	9.4	N/A	8420463	7.5	8420463	5.3	N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	N/A	8421091	FIELD	ONSITE	LAB	N/A	8421091
Ion Balance	N/A	0.98	0.010	8419995	0.97	8419995	0.98	0.010	8419995
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8423254	0.00589	8423254	<0.00050	0.00050	8423254
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8423265	0.00373	8423265	<0.00050	0.00050	8423265
Alkalinity (Total as CaCO3)	mg/L	169	0.50	8421860	236	8421860	209	0.50	8421855
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8421860	<0.50	8421860	<0.50	0.50	8421855
Bicarbonate (HCO3)	mg/L	206	0.50	8421860	288	8421860	255	0.50	8421855
Carbonate (CO3)	mg/L	<0.50	0.50	8421860	<0.50	8421860	<0.50	0.50	8421855
Hydroxide (OH)	mg/L	<0.50	0.50	8421860	<0.50	8421860	<0.50	0.50	8421855
Anions									
Dissolved Sulphate (SO4)	mg/L	297 (1)	5.0	8421635	25.0	8421635	55.8	0.50	8421625
Dissolved Chloride (Cl)	mg/L	0.97	0.50	8421628	5.5	8421628	1.9	0.50	8421622
Nutrients									
Total Ammonia (N)	mg/L	0.055	0.0050	8423416	<0.0050	8423413	0.028	0.0050	8423413
Physical Properties									
Conductivity	uS/cm	861	1.0	8421862	757	8421862	503	1.0	8421857
pH	pH	7.80		8421861	8.03	8421861	7.40		8421856
Physical Properties									
Total Dissolved Solids	mg/L	624	10	8421346	436	8421346	290	10	8421346

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1148		PR1149		PR1151		PR1152		
Sampling Date		2016/09/29 14:52		2016/09/27		2016/09/29 11:47		2016/09/29 15:31		
COC Number		08427985		08427985		08427986		08427986		
	UNITS	BC-69 LP	QC Batch	DUP A LQS	QC Batch	BC-10 LP	QC Batch	BC-12 LP	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	10	8420463	7.7	8420463		8420463		N/A	8420463
Cation Sum	meq/L	9.4	8420463	7.5	8420463		8420463		N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	8421091	FIELD	ONSITE	LAB	8421091	LAB	N/A	8421091
Ion Balance	N/A	0.92	8419995	0.98	8419995				0.010	
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8423254	0.00590	8423254				0.00050	
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8423265	0.00400	8423265				0.00050	
Alkalinity (Total as CaCO3)	mg/L	350	8421860	234	8421855	140	8421855	212	0.50	8421860
Alkalinity (PP as CaCO3)	mg/L	<0.50	8421860	<0.50	8421855	<0.50	8421855	<0.50	0.50	8421860
Bicarbonate (HCO3)	mg/L	427	8421860	285	8421855	171	8421855	259	0.50	8421860
Carbonate (CO3)	mg/L	<0.50	8421860	<0.50	8421855	<0.50	8421855	<0.50	0.50	8421860
Hydroxide (OH)	mg/L	<0.50	8421860	<0.50	8421855	<0.50	8421855	<0.50	0.50	8421860
Anions										
Dissolved Sulphate (SO4)	mg/L	151	8421635	26.0	8421625	124	8421625	188	0.50	8421635
Dissolved Chloride (Cl)	mg/L	2.7	8421628	5.5	8421622				0.50	
Nutrients										
Total Ammonia (N)	mg/L	0.020	8423416	0.0090	8423416	<0.0050	8423413	0.049	0.0050	8423413
Physical Properties										
Conductivity	uS/cm	873	8421862	750	8421857	498	8421857	744	1.0	8421862
pH	pH	7.79	8421861	7.93	8421856	8.16	8421856	7.98		8421861
Physical Properties										
Total Suspended Solids	mg/L					1.4	8421561	1.2 (1)	1.0	8421561
Total Dissolved Solids	mg/L	504	8421346	436	8421346	318	8421346	500	10	8421346

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) RDL raised due to limited initial sample amount.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1153		PR1154		PR1164	PR1165		
Sampling Date		2016/09/29 12:17		2016/09/29 11:26		2016/09/29 16:26	2016/09/28 14:42		
COC Number		08427986		08427986		08427987	08427987		
	UNITS	BC-15 LP	RDL	BC-17 LP	QC Batch	BC-3 LP	BC-4 LP	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L		N/A		8420463	6.1	7.0	N/A	8420463
Cation Sum	meq/L		N/A		8420463	5.8	6.8	N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	N/A	LAB	8421091	LAB	LAB	N/A	8421091
Ion Balance	N/A		0.010		8419995	0.95	0.97	0.010	8419995
Misc. Inorganics									
Alkalinity (Total as CaCO3)	mg/L	147	0.50	118	8421855	136	152	0.50	8421855
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	<0.50	8421855	<0.50	<0.50	0.50	8421855
Bicarbonate (HCO3)	mg/L	179	0.50	144	8421855	166	185	0.50	8421855
Carbonate (CO3)	mg/L	<0.50	0.50	<0.50	8421855	<0.50	<0.50	0.50	8421855
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	8421855	<0.50	<0.50	0.50	8421855
Anions									
Dissolved Sulphate (SO4)	mg/L	472 (1)	5.0	59.0	8421625	161	190	0.50	8421625
Dissolved Chloride (Cl)	mg/L				8421622	1.0	0.63	0.50	8421622
Nutrients									
Total Ammonia (N)	mg/L	0.012	0.0050	0.0052	8423413	0.023	0.050	0.0050	8423416
Physical Properties									
Conductivity	uS/cm	1060	1.0	353	8421857	555	650	1.0	8421857
pH	pH	8.12		8.04	8421856	8.10	8.04		8421856
Physical Properties									
Total Suspended Solids	mg/L	1.5	1.0	<1.0 (2)	8421561	23.2	6.9	1.0	8421561
Total Dissolved Solids	mg/L	834	10	248	8421346	386	480	10	8421346

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) RDL raised due to limited initial sample amount.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PR1166			PR1167	PR1168		PR1169		
Sampling Date		2016/09/28 15:30			2016/09/27 15:37	2016/09/27 15:10		2016/09/27		
COC Number		08427987			08427988	08427988		08427988		
	UNITS	BC-5 LP	RDL	QC Batch	BC-28A LP	BC-28B LP	QC Batch	DUP B LQS	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	6.1	N/A	8420463			8420463		N/A	8420463
Cation Sum	meq/L	5.7	N/A	8420463			8420463		N/A	8420463
Filter and HNO3 Preservation	N/A	LAB	N/A	8421091	FIELD	FIELD	ONSITE	FIELD	N/A	ONSITE
Ion Balance	N/A	0.94	0.010	8419995					0.010	
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L		0.00050		0.464	0.118	8423254	0.462	0.0050	8423260
Weak Acid Dissoc. Cyanide (CN)	mg/L		0.00050		0.0510	0.0914	8423265	0.0471	0.00050	8423271
Alkalinity (Total as CaCO3)	mg/L	138	0.50	8421855						
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8421855						
Bicarbonate (HCO3)	mg/L	169	0.50	8421855						
Carbonate (CO3)	mg/L	<0.50	0.50	8421855						
Hydroxide (OH)	mg/L	<0.50	0.50	8421855						
Anions										
Dissolved Sulphate (SO4)	mg/L	156	0.50	8421625						
Dissolved Chloride (Cl)	mg/L	0.95	0.50	8421622						
Nutrients										
Total Ammonia (N)	mg/L	0.065	0.0050	8423413	0.015	0.053	8423416	0.024	0.0050	8423416
Physical Properties										
Conductivity	uS/cm	545	1.0	8421857						
pH	pH	8.09		8421856						
Physical Properties										
Total Suspended Solids	mg/L	11.1	1.0	8421561	1.1	110	8420455	<1.0	1.0	8420455
Total Dissolved Solids	mg/L	392	10	8421346						

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1130		PR1131	PR1132	PR1133		
Sampling Date		2016/09/28 12:02		2016/09/30	2016/09/28 09:28	2016/09/28 13:55		
COC Number		08427984		08427984	08427984	08427984		
	UNITS	BC-1 LP	QC Batch	TRIP BLANK LQTB	BC-6 LP	BC-31 LP	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	270	8424117	<0.50	152	296	0.50	8419623
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	8422522	<0.0000020	<0.0000020	0.0000024	0.0000020	8422522
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.0197	8421336	<0.00050	0.00830	0.0154	0.00050	8421336
Dissolved Antimony (Sb)	mg/L	0.00265	8421336	<0.000020	0.000172	0.000539	0.000020	8421336
Dissolved Arsenic (As)	mg/L	0.00609	8421336	<0.000020	0.000559	0.000433	0.000020	8421336
Dissolved Barium (Ba)	mg/L	0.0724	8421336	<0.000020	0.0547	0.0674	0.000020	8421336
Dissolved Beryllium (Be)	mg/L	<0.000010	8421336	<0.000010	<0.000010	<0.000010	0.000010	8421336
Dissolved Bismuth (Bi)	mg/L	<0.0000050	8421336	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Boron (B)	mg/L	<0.010	8421336	<0.010	<0.010	<0.010	0.010	8421336
Dissolved Cadmium (Cd)	mg/L	0.0000230	8421336	<0.0000050	0.0000270	0.0000440	0.0000050	8421336
Dissolved Chromium (Cr)	mg/L	0.00021	8421336	<0.00010	<0.00010	0.00011	0.00010	8421336
Dissolved Cobalt (Co)	mg/L	0.000922	8421336	<0.0000050	0.0000330	0.000103	0.0000050	8421336
Dissolved Copper (Cu)	mg/L	0.00123	8421336	<0.000050	0.000494	0.00115	0.000050	8421336
Dissolved Iron (Fe)	mg/L	0.0827	8421336	<0.0010	0.0099	0.0339	0.0010	8421336
Dissolved Lead (Pb)	mg/L	0.0000190	8421336	<0.0000050	0.0000200	<0.0000050	0.0000050	8421336
Dissolved Lithium (Li)	mg/L	0.0107	8421336	<0.00050	0.00200	0.00518	0.00050	8421336
Dissolved Manganese (Mn)	mg/L	0.177	8421336	<0.000050	0.00666	0.0329	0.000050	8421336
Dissolved Molybdenum (Mo)	mg/L	0.00297	8421336	<0.000050	0.000544	0.00160	0.000050	8421336
Dissolved Nickel (Ni)	mg/L	0.00413	8421336	<0.000020	0.000882	0.00231	0.000020	8421336
Dissolved Phosphorus (P)	mg/L	0.0123	8421336	<0.0020	<0.0020	0.0038	0.0020	8421336
Dissolved Selenium (Se)	mg/L	0.00182	8421336	<0.000040	0.000649	0.00197	0.000040	8421336
Dissolved Silicon (Si)	mg/L	5.26	8421336	<0.050	2.70	3.71	0.050	8421336
Dissolved Silver (Ag)	mg/L	<0.0000050	8421336	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Strontium (Sr)	mg/L	0.379	8421336	<0.000050	0.244	0.361	0.000050	8421336
Dissolved Thallium (Tl)	mg/L	0.0000030	8421336	<0.0000020	<0.0000020	0.0000030	0.0000020	8421336
Dissolved Tin (Sn)	mg/L	<0.00020	8421336	<0.00020	<0.00020	<0.00020	0.00020	8421336
Dissolved Titanium (Ti)	mg/L	<0.00050	8421336	<0.00050	<0.00050	<0.00050	0.00050	8421336
Dissolved Uranium (U)	mg/L	0.00256	8421336	<0.0000020	0.000835	0.00291	0.0000020	8421336

RDL = Reportable Detection Limit

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1130		PR1131	PR1132	PR1133		
Sampling Date		2016/09/28 12:02		2016/09/30	2016/09/28 09:28	2016/09/28 13:55		
COC Number		08427984		08427984	08427984	08427984		
	UNITS	BC-1 LP	QC Batch	TRIP BLANK LQTB	BC-6 LP	BC-31 LP	RDL	QC Batch
Dissolved Vanadium (V)	mg/L	0.00151	8421336	<0.00020	<0.00020	0.00071	0.00020	8421336
Dissolved Zinc (Zn)	mg/L	0.00168	8421336	<0.00010	0.00209	0.00303	0.00010	8421336
Dissolved Zirconium (Zr)	mg/L	0.00019	8421336	<0.00010	<0.00010	0.00011	0.00010	8421336
Dissolved Calcium (Ca)	mg/L	67.1	8424618	<0.050	41.3	71.9	0.050	8419624
Dissolved Magnesium (Mg)	mg/L	25.0	8424618	<0.050	11.9	28.4	0.050	8419624
Dissolved Potassium (K)	mg/L	1.18	8424618	<0.050	0.459	0.908	0.050	8419624
Dissolved Sodium (Na)	mg/L	4.10	8424618	<0.050	1.88	1.92	0.050	8419624
Dissolved Sulphur (S)	mg/L	43.9	8424618	<3.0	20.0	40.5	3.0	8419624
RDL = Reportable Detection Limit								

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1134	PR1135		PR1136		
Sampling Date		2016/09/28 16:24	2016/09/28 09:54		2016/09/27 17:53		
COC Number		08427984	08427984		08427984		
	UNITS	BC-34 LP	BC-39 LP	QC Batch	BC-51W LP	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	261	133	8419623	240	0.50	8419623
Elements							
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	8422522	0.0000022	0.0000020	8422522
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.00612	0.00127	8421336	4.48	0.00050	8421336
Dissolved Antimony (Sb)	mg/L	0.000242	0.000228	8421336	0.00266	0.000020	8421336
Dissolved Arsenic (As)	mg/L	0.000203	0.000319	8421336	0.0146	0.000020	8421336
Dissolved Barium (Ba)	mg/L	0.0502	0.0752	8421336	0.0429	0.000020	8421336
Dissolved Beryllium (Be)	mg/L	<0.000010	<0.000010	8421336	0.0101	0.000010	8421336
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	8421336	<0.0000050	0.0000050	8421336
Dissolved Boron (B)	mg/L	<0.010	<0.010	8421336	0.011	0.010	8421336
Dissolved Cadmium (Cd)	mg/L	0.0000830	0.0000300	8421336	0.00380	0.0000050	8421336
Dissolved Chromium (Cr)	mg/L	0.00010	<0.00010	8421336	0.00100	0.00010	8421336
Dissolved Cobalt (Co)	mg/L	0.0000470	0.0000320	8421336	0.0393	0.0000050	8421336
Dissolved Copper (Cu)	mg/L	0.00108	0.000442	8421336	0.212	0.000050	8421336
Dissolved Iron (Fe)	mg/L	0.0163	<0.0010	8421336	2.74	0.0010	8421336
Dissolved Lead (Pb)	mg/L	<0.0000050	<0.0000050	8421336	0.000137	0.0000050	8421336
Dissolved Lithium (Li)	mg/L	0.00243	0.00149	8421336	0.00991	0.00050	8421336
Dissolved Manganese (Mn)	mg/L	0.0129	0.000396	8421336	1.97	0.000050	8421336
Dissolved Molybdenum (Mo)	mg/L	0.00141	0.000593	8421336	<0.000050	0.000050	8421336
Dissolved Nickel (Ni)	mg/L	0.00242	0.000417	8421336	0.123	0.000020	8421336
Dissolved Phosphorus (P)	mg/L	0.0044	<0.0020	8421336	<0.0020	0.0020	8421336
Dissolved Selenium (Se)	mg/L	0.00204	0.000506	8421336	0.00465	0.000040	8421336
Dissolved Silicon (Si)	mg/L	3.16	2.86	8421336	10.0	0.050	8421336
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	8421336	<0.0000050	0.0000050	8421336
Dissolved Strontium (Sr)	mg/L	0.270	0.217	8421336	0.377	0.000050	8421336
Dissolved Thallium (Tl)	mg/L	0.0000020	<0.0000020	8421336	0.0000880	0.0000020	8424311
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	8421336	<0.00020	0.00020	8421336
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	8421336	<0.00050	0.00050	8421336
Dissolved Uranium (U)	mg/L	0.00169	0.000728	8421336	0.00365	0.0000020	8421336

RDL = Reportable Detection Limit

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1134	PR1135		PR1136		
Sampling Date		2016/09/28 16:24	2016/09/28 09:54		2016/09/27 17:53		
COC Number		08427984	08427984		08427984		
	UNITS	BC-34 LP	BC-39 LP	QC Batch	BC-51W LP	RDL	QC Batch
Dissolved Vanadium (V)	mg/L	0.00072	<0.00020	8421336	<0.00020	0.00020	8421336
Dissolved Zinc (Zn)	mg/L	0.00800	0.00154	8421336	0.322	0.00010	8421336
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	8421336	<0.00010	0.00010	8421336
Dissolved Calcium (Ca)	mg/L	65.4	36.7	8419624	53.2	0.050	8419624
Dissolved Magnesium (Mg)	mg/L	23.6	10.1	8419624	25.9	0.050	8419624
Dissolved Potassium (K)	mg/L	0.654	0.560	8419624	1.63	0.050	8419624
Dissolved Sodium (Na)	mg/L	1.34	2.04	8419624	0.763	0.050	8419624
Dissolved Sulphur (S)	mg/L	38.4	17.6	8419624	87.9	3.0	8419624
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1137	PR1138	PR1139	PR1142		
Sampling Date		2016/09/28 10:45	2016/09/28	2016/09/30	2016/09/27 13:15		
COC Number		08427984	08427984	08427984	08427985		
	UNITS	BC-53 LP	DUP C LQS	FIELD BLANK LQFB	BC-19 LP	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	256	257	<0.50	701	0.50	8419623
Elements							
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000020	8422522
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.0208	0.00647	<0.00050	0.00120	0.00050	8421336
Dissolved Antimony (Sb)	mg/L	0.00265	0.000234	<0.000020	0.000179	0.000020	8421336
Dissolved Arsenic (As)	mg/L	0.00474	0.000212	<0.000020	0.000408	0.000020	8421336
Dissolved Barium (Ba)	mg/L	0.0706	0.0499	<0.000020	0.00342	0.000020	8421336
Dissolved Beryllium (Be)	mg/L	0.000010	<0.000010	<0.000010	<0.000010	0.000010	8421336
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Boron (B)	mg/L	<0.010	<0.010	<0.010	0.019	0.010	8421336
Dissolved Cadmium (Cd)	mg/L	0.0000200	0.0000800	<0.0000050	0.000930	0.0000050	8421336
Dissolved Chromium (Cr)	mg/L	0.00015	<0.00010	<0.00010	<0.00010	0.00010	8421336
Dissolved Cobalt (Co)	mg/L	0.000802	0.0000480	<0.0000050	0.000862	0.0000050	8421336
Dissolved Copper (Cu)	mg/L	0.000999	0.00104	<0.000050	0.000299	0.000050	8421336
Dissolved Iron (Fe)	mg/L	0.0854	0.0161	<0.0010	0.0013	0.0010	8421336
Dissolved Lead (Pb)	mg/L	0.0000190	<0.0000050	<0.0000050	0.0000150	0.0000050	8421336
Dissolved Lithium (Li)	mg/L	0.0109	0.00268	<0.00050	0.0336	0.00050	8421336
Dissolved Manganese (Mn)	mg/L	0.135	0.0130	<0.000050	0.468	0.000050	8421336
Dissolved Molybdenum (Mo)	mg/L	0.00284	0.00146	<0.000050	<0.000050	0.000050	8421336
Dissolved Nickel (Ni)	mg/L	0.00335	0.00242	<0.000020	0.00318	0.000020	8421336
Dissolved Phosphorus (P)	mg/L	0.0035	0.0032	<0.0020	0.0207	0.0020	8421336
Dissolved Selenium (Se)	mg/L	0.00189	0.00205	<0.000040	0.00593	0.000040	8421336
Dissolved Silicon (Si)	mg/L	5.22	3.14	<0.050	6.72	0.050	8421336
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Strontium (Sr)	mg/L	0.297	0.278	<0.000050	0.579	0.000050	8421336
Dissolved Thallium (Tl)	mg/L	<0.0000020	<0.0000020	<0.0000020	0.0000160	0.0000020	8421336
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421336
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8421336
Dissolved Uranium (U)	mg/L	0.00252	0.00164	<0.0000020	0.00103	0.0000020	8421336

RDL = Reportable Detection Limit

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1137	PR1138	PR1139	PR1142		
Sampling Date		2016/09/28 10:45	2016/09/28	2016/09/30	2016/09/27 13:15		
COC Number		08427984	08427984	08427984	08427985		
	UNITS	BC-53 LP	DUP C LQS	FIELD BLANK LQFB	BC-19 LP	RDL	QC Batch
Dissolved Vanadium (V)	mg/L	0.00108	0.00070	<0.00020	<0.00020	0.00020	8421336
Dissolved Zinc (Zn)	mg/L	0.00121	0.00818	<0.00010	0.0311	0.00010	8421336
Dissolved Zirconium (Zr)	mg/L	0.00017	<0.00010	<0.00010	<0.00010	0.00010	8421336
Dissolved Calcium (Ca)	mg/L	64.0	65.3	<0.050	159	0.050	8419624
Dissolved Magnesium (Mg)	mg/L	23.4	22.9	<0.050	73.6	0.050	8419624
Dissolved Potassium (K)	mg/L	1.16	0.667	<0.050	2.63	0.050	8419624
Dissolved Sodium (Na)	mg/L	3.79	1.35	<0.050	11.1	0.050	8419624
Dissolved Sulphur (S)	mg/L	40.3	37.5	<3.0	140	3.0	8419624
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1143	PR1144	PR1145	PR1146	PR1147		
Sampling Date		2016/09/27 17:23	2016/09/27 14:30	2016/09/29 10:04	2016/09/27 12:07	2016/09/29 13:38		
COC Number		08427985	08427985	08427985	08427985	08427985		
	UNITS	BC-21 LP	BC-22 LP	BC-27 LP	BC-66 LP	BC-67 LP	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	700	828	466	349	257	0.50	8419623
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000020	8422522
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	<0.00050	0.515	<0.00050	<0.00050	<0.00050	0.00050	8421336
Dissolved Antimony (Sb)	mg/L	0.000168	0.000024	0.00199	0.000136	0.0982	0.000020	8421336
Dissolved Arsenic (As)	mg/L	0.0110	0.000135	0.0616	0.000206	0.00403	0.000020	8421336
Dissolved Barium (Ba)	mg/L	0.0233	0.00941	0.0105	0.0490	0.113	0.000020	8421336
Dissolved Beryllium (Be)	mg/L	<0.000010	0.000223	<0.000010	<0.000010	<0.000010	0.000010	8421336
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Boron (B)	mg/L	0.032	0.038	<0.010	<0.010	<0.010	0.010	8421336
Dissolved Cadmium (Cd)	mg/L	0.0000420	0.0127	0.0000480	0.0000590	0.000191	0.0000050	8421336
Dissolved Chromium (Cr)	mg/L	<0.00010	0.00220	<0.00010	0.00012	<0.00010	0.00010	8421336
Dissolved Cobalt (Co)	mg/L	0.00359	0.00929	0.000183	0.0730	0.00382	0.0000050	8421336
Dissolved Copper (Cu)	mg/L	0.000450	0.000950	<0.000050	0.000317	0.000240	0.000050	8421336
Dissolved Iron (Fe)	mg/L	0.0020	0.165	0.0050	<0.0010	<0.0010	0.0010	8421336
Dissolved Lead (Pb)	mg/L	<0.0000050	0.0000230	<0.0000050	0.0000090	<0.0000050	0.0000050	8421336
Dissolved Lithium (Li)	mg/L	0.0410	0.0744	0.0101	0.0193	0.00654	0.00050	8421336
Dissolved Manganese (Mn)	mg/L	2.18	0.806	0.223	0.000174	0.411	0.000050	8421336
Dissolved Molybdenum (Mo)	mg/L	0.000395	0.000372	0.0117	0.000179	0.000587	0.000050	8421336
Dissolved Nickel (Ni)	mg/L	0.00528	0.143	0.00218	0.000428	0.0230	0.000020	8421336
Dissolved Phosphorus (P)	mg/L	<0.0020	0.0168	<0.0020	0.0045	0.0141	0.0020	8421336
Dissolved Selenium (Se)	mg/L	0.000339	0.0462	<0.000040	0.0148	0.000056	0.000040	8421336
Dissolved Silicon (Si)	mg/L	5.55	14.6	3.61	4.38	4.22	0.050	8421336
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Strontium (Sr)	mg/L	0.551	0.411	0.803	0.385	0.325	0.000050	8421336
Dissolved Thallium (Tl)	mg/L	0.0000180	0.0000720	0.0000030	0.0000070	0.0000700	0.0000020	8421336
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421336
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8421336
Dissolved Uranium (U)	mg/L	0.00277	0.0000660	0.0127	0.000976	0.00808	0.0000020	8421336

RDL = Reportable Detection Limit

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1143	PR1144	PR1145	PR1146	PR1147		
Sampling Date		2016/09/27 17:23	2016/09/27 14:30	2016/09/29 10:04	2016/09/27 12:07	2016/09/29 13:38		
COC Number		08427985	08427985	08427985	08427985	08427985		
	UNITS	BC-21 LP	BC-22 LP	BC-27 LP	BC-66 LP	BC-67 LP	RDL	QC Batch
Dissolved Vanadium (V)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421336
Dissolved Zinc (Zn)	mg/L	0.0888	0.299	0.0228	0.00246	0.0972	0.00010	8421336
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8421336
Dissolved Calcium (Ca)	mg/L	151	219	117	72.4	65.6	0.050	8419624
Dissolved Magnesium (Mg)	mg/L	78.3	68.3	42.2	41.0	22.7	0.050	8419624
Dissolved Potassium (K)	mg/L	3.76	4.39	1.38	2.37	1.75	0.050	8419624
Dissolved Sodium (Na)	mg/L	8.36	13.3	1.59	10.2	1.81	0.050	8419624
Dissolved Sulphur (S)	mg/L	134	244	89.4	7.2	15.7	3.0	8419624

RDL = Reportable Detection Limit

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1148	PR1149	PR1151	PR1152		
Sampling Date		2016/09/29 14:52	2016/09/27	2016/09/29 11:47	2016/09/29 15:31		
COC Number		08427985	08427985	08427986	08427986		
	UNITS	BC-69 LP	DUP A LQS	BC-10 LP	BC-12 LP	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	457	351	252	388	0.50	8419623
Elements							
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000020	8422522
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.00083	<0.00050	0.00090	0.0110	0.00050	8421336
Dissolved Antimony (Sb)	mg/L	0.00515	0.000135	0.0994	0.0926	0.000020	8421336
Dissolved Arsenic (As)	mg/L	0.0404	0.000166	0.0140	0.0749	0.000020	8421336
Dissolved Barium (Ba)	mg/L	0.0248	0.0499	0.131	0.0292	0.000020	8421336
Dissolved Beryllium (Be)	mg/L	<0.000010	<0.000010	<0.000010	0.000060	0.000010	8421336
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Boron (B)	mg/L	<0.010	<0.010	<0.010	0.020	0.010	8421336
Dissolved Cadmium (Cd)	mg/L	0.000968	0.0000640	0.0000200	0.000216	0.0000050	8421336
Dissolved Chromium (Cr)	mg/L	0.00013	0.00015	<0.00010	<0.00010	0.00010	8421336
Dissolved Cobalt (Co)	mg/L	0.000288	0.0708	0.0000300	0.00446	0.0000050	8421336
Dissolved Copper (Cu)	mg/L	0.000172	0.000302	0.000311	0.000328	0.000050	8421336
Dissolved Iron (Fe)	mg/L	<0.0010	0.0011	0.0026	0.0108	0.0010	8421336
Dissolved Lead (Pb)	mg/L	0.0000070	0.0000060	0.0000050	<0.0000050	0.0000050	8421336
Dissolved Lithium (Li)	mg/L	0.00787	0.0192	0.00335	0.00656	0.00050	8421336
Dissolved Manganese (Mn)	mg/L	0.271	0.000178	0.000338	0.316	0.000050	8421336
Dissolved Molybdenum (Mo)	mg/L	0.000309	0.000175	0.00417	0.00985	0.000050	8421336
Dissolved Nickel (Ni)	mg/L	0.00315	0.000414	0.000420	0.0169	0.000020	8421336
Dissolved Phosphorus (P)	mg/L	0.0054	0.0035	0.0026	<0.0020	0.0020	8421336
Dissolved Selenium (Se)	mg/L	0.000883	0.0144	0.00517	0.000337	0.000040	8421336
Dissolved Silicon (Si)	mg/L	2.90	4.46	1.63	4.13	0.050	8421336
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421336
Dissolved Strontium (Sr)	mg/L	0.501	0.393	0.513	0.658	0.000050	8421336
Dissolved Thallium (Tl)	mg/L	0.000204	0.0000450	0.0000490 (1)	0.0000620	0.0000020	8421336
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421336
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8421336

RDL = Reportable Detection Limit
(1) Dissolved greater than total. Reanalysis yields similar results.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1148	PR1149	PR1151	PR1152		
Sampling Date		2016/09/29 14:52	2016/09/27	2016/09/29 11:47	2016/09/29 15:31		
COC Number		08427985	08427985	08427986	08427986		
	UNITS	BC-69 LP	DUP A LQS	BC-10 LP	BC-12 LP	RDL	QC Batch
Dissolved Uranium (U)	mg/L	0.00446	0.000955	0.0102	0.00965	0.0000020	8421336
Dissolved Vanadium (V)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421336
Dissolved Zinc (Zn)	mg/L	0.110	0.00255	0.00028	0.0195	0.00010	8421336
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8421336
Dissolved Calcium (Ca)	mg/L	92.9	72.4	61.4	102	0.050	8419624
Dissolved Magnesium (Mg)	mg/L	54.7	41.4	23.9	32.6	0.050	8419624
Dissolved Potassium (K)	mg/L	5.68	2.42	1.42	1.72	0.050	8419624
Dissolved Sodium (Na)	mg/L	2.74	10.5	0.750	0.872	0.050	8419624
Dissolved Sulphur (S)	mg/L	39.5	6.9	36.0	55.9	3.0	8419624

RDL = Reportable Detection Limit

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1153	PR1154	PR1164	PR1165	PR1166		
Sampling Date		2016/09/29 12:17	2016/09/29 11:26	2016/09/29 16:26	2016/09/28 14:42	2016/09/28 15:30		
COC Number		08427986	08427986	08427987	08427987	08427987		
	UNITS	BC-15 LP	BC-17 LP	BC-3 LP	BC-4 LP	BC-5 LP	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	597	174	280	335	279	0.50	8419623
Elements								
Dissolved Mercury (Hg)	mg/L	0.0000025	0.0000026	<0.0000020	<0.0000020	0.0000022	0.0000020	8422545
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.00177	0.00058	0.0387	0.0100	0.0164	0.00050	8421345
Dissolved Antimony (Sb)	mg/L	0.00427	0.136	0.00355	0.00332	0.000523	0.000020	8421345
Dissolved Arsenic (As)	mg/L	0.0463	0.0379	0.00215	0.00219	0.000517	0.000020	8421345
Dissolved Barium (Ba)	mg/L	0.0509	0.116	0.0704	0.0660	0.0806	0.000020	8421345
Dissolved Beryllium (Be)	mg/L	<0.000010	<0.000010	0.000024	<0.000010	<0.000010	0.000010	8421345
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421345
Dissolved Boron (B)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	8421345
Dissolved Cadmium (Cd)	mg/L	0.0000170	0.0000220	0.0000650	0.000111	0.0000640	0.0000050	8421345
Dissolved Chromium (Cr)	mg/L	<0.00010	0.00019	0.00011	<0.00010	0.00016	0.00010	8421345
Dissolved Cobalt (Co)	mg/L	0.0000080	0.0000070	0.00151	0.000378	0.000148	0.0000050	8421345
Dissolved Copper (Cu)	mg/L	0.000163	0.000108	0.000957	0.000413	0.00128	0.000050	8421345
Dissolved Iron (Fe)	mg/L	<0.0010	<0.0010	0.0968	0.0399	0.0955	0.0010	8421345
Dissolved Lead (Pb)	mg/L	<0.0000050	<0.0000050	0.0000070	0.0000050	0.0000080	0.0000050	8421345
Dissolved Lithium (Li)	mg/L	0.00183	0.00266	0.0126	0.00821	0.00400	0.00050	8421345
Dissolved Manganese (Mn)	mg/L	0.000434	0.000183	0.152	0.116	0.0552	0.000050	8421345
Dissolved Molybdenum (Mo)	mg/L	0.000982	0.00890	0.00234	0.00248	0.00270	0.000050	8421345
Dissolved Nickel (Ni)	mg/L	0.000558	0.00145	0.00610	0.00310	0.00404	0.000020	8421345
Dissolved Phosphorus (P)	mg/L	0.0051	0.0098	0.0077	0.0056	0.0082	0.0020	8421345
Dissolved Selenium (Se)	mg/L	0.0184	0.00856	0.00191	0.00412	0.00162	0.000040	8421345
Dissolved Silicon (Si)	mg/L	2.10	3.93	4.45	3.44	3.87	0.050	8421345
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421345
Dissolved Strontium (Sr)	mg/L	1.35	0.271	0.350	0.510	0.285	0.000050	8421345
Dissolved Thallium (Tl)	mg/L	0.0000190	0.0000230	0.0000070	0.0000080	0.0000040	0.0000020	8421345
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421345
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8421345
Dissolved Uranium (U)	mg/L	0.00478	0.00617	0.00216	0.00343	0.00184	0.0000020	8421345

RDL = Reportable Detection Limit

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1153	PR1154	PR1164	PR1165	PR1166		
Sampling Date		2016/09/29 12:17	2016/09/29 11:26	2016/09/29 16:26	2016/09/28 14:42	2016/09/28 15:30		
COC Number		08427986	08427986	08427987	08427987	08427987		
	UNITS	BC-15 LP	BC-17 LP	BC-3 LP	BC-4 LP	BC-5 LP	RDL	QC Batch
Dissolved Vanadium (V)	mg/L	<0.00020	<0.00020	0.00047	0.00074	0.00093	0.00020	8421345
Dissolved Zinc (Zn)	mg/L	0.00051	0.0111	0.00604	0.00653	0.0111	0.00010	8421345
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	0.00013	<0.00010	0.00017	0.00010	8421345
Dissolved Calcium (Ca)	mg/L	136	47.6	69.6	81.6	69.6	0.050	8419624
Dissolved Magnesium (Mg)	mg/L	62.3	13.5	25.7	31.9	25.5	0.050	8419624
Dissolved Potassium (K)	mg/L	0.990	0.746	1.31	1.28	0.715	0.050	8419624
Dissolved Sodium (Na)	mg/L	0.447	1.09	3.13	1.80	1.83	0.050	8419624
Dissolved Sulphur (S)	mg/L	135	16.3	44.2	57.3	43.4	3.0	8419624

RDL = Reportable Detection Limit

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1167	PR1168			PR1169		
Sampling Date		2016/09/27 15:37	2016/09/27 15:10			2016/09/27		
COC Number		08427988	08427988			08427988		
	UNITS	BC-28A LP	BC-28B LP	RDL	QC Batch	DUP B LQS	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	1330	1040	0.50	8419623	1290	0.50	8419623
Elements								
Dissolved Mercury (Hg)	mg/L	0.0000393	0.0000143	0.0000020	8422545	0.0000423	0.0000020	8422545
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.0112	0.0181	0.0025	8421345	0.0075	0.0025	8421345
Dissolved Antimony (Sb)	mg/L	1.86	1.60	0.00010	8421345	1.89	0.00010	8421345
Dissolved Arsenic (As)	mg/L	0.308	0.193	0.00010	8421345	0.307	0.00010	8421345
Dissolved Barium (Ba)	mg/L	0.0361	0.0351	0.00010	8421345	0.0363	0.00010	8421345
Dissolved Beryllium (Be)	mg/L	<0.000050	<0.000050	0.000050	8421345	<0.000050	0.000050	8421345
Dissolved Bismuth (Bi)	mg/L	<0.000025	<0.000025	0.000025	8421345	<0.000025	0.000025	8421345
Dissolved Boron (B)	mg/L	<0.050	<0.050	0.050	8421345	<0.050	0.050	8421345
Dissolved Cadmium (Cd)	mg/L	0.000250	0.000085	0.000025	8421345	0.000287	0.000025	8421345
Dissolved Chromium (Cr)	mg/L	<0.00050	<0.00050	0.00050	8421345	<0.00050	0.00050	8421345
Dissolved Cobalt (Co)	mg/L	0.617	0.482	0.000025	8421345	0.615	0.000025	8421345
Dissolved Copper (Cu)	mg/L	0.00134	0.00155	0.00025	8421345	0.00136	0.00025	8421345
Dissolved Iron (Fe)	mg/L	0.205	0.0300	0.0050	8421345	0.193	0.0050	8421345
Dissolved Lead (Pb)	mg/L	<0.000025	<0.000025	0.000025	8421345	<0.000025	0.000025	8421345
Dissolved Lithium (Li)	mg/L	0.0057	0.0053	0.0025	8421345	0.0051	0.0025	8421345
Dissolved Manganese (Mn)	mg/L	0.0298	0.0488	0.00025	8421345	0.0292	0.00025	8421345
Dissolved Molybdenum (Mo)	mg/L	0.0180	0.0174	0.00025	8421345	0.0183	0.00025	8421345
Dissolved Nickel (Ni)	mg/L	0.00813	0.00540	0.00010	8421345	0.00782	0.00010	8421345
Dissolved Phosphorus (P)	mg/L	0.056	0.012	0.010	8421345	0.0444 (1)	0.0020	8424311
Dissolved Selenium (Se)	mg/L	0.181	0.146	0.00020	8421345	0.180	0.00020	8421345
Dissolved Silicon (Si)	mg/L	4.82	1.00	0.25	8421345	4.57	0.25	8421345
Dissolved Silver (Ag)	mg/L	<0.000025	<0.000025	0.000025	8421345	<0.000025	0.000025	8421345
Dissolved Strontium (Sr)	mg/L	1.90	1.51	0.00025	8421345	1.91	0.00025	8421345
Dissolved Thallium (Tl)	mg/L	0.000121	0.000112	0.000010	8421345	0.000145	0.000010	8421345
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	0.0010	8421345	<0.0010	0.0010	8421345
Dissolved Titanium (Ti)	mg/L	<0.0025	<0.0025	0.0025	8421345	<0.0025	0.0025	8421345

RDL = Reportable Detection Limit
(1) Dissolved greater than total. Reanalysis yields similar results.

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		PR1167	PR1168			PR1169		
Sampling Date		2016/09/27 15:37	2016/09/27 15:10			2016/09/27		
COC Number		08427988	08427988			08427988		
	UNITS	**BC-28A LP**	**BC-28B LP**	**RDL**	**QC Batch**	**DUP B LQS**	**RDL**	**QC Batch**
Dissolved Uranium (U)	mg/L	0.0318	0.0218	0.000010	8421345	0.0309	0.000010	8421345
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	0.0010	8421345	<0.0010	0.0010	8421345
Dissolved Zinc (Zn)	mg/L	0.00878	0.00220	0.00050	8421345	0.00885	0.00050	8421345
Dissolved Zirconium (Zr)	mg/L	<0.00050	<0.00050	0.00050	8421345	<0.00050	0.00050	8421345
Dissolved Calcium (Ca)	mg/L	390	300	0.25	8419624	375	0.25	8419624
Dissolved Magnesium (Mg)	mg/L	87.2	70.4	0.25	8419624	86.6	0.25	8419624
Dissolved Potassium (K)	mg/L	5.03	4.43	0.25	8419624	5.04	0.25	8419624
Dissolved Sodium (Na)	mg/L	414	337	0.25	8419624	411	0.25	8419624
Dissolved Sulphur (S)	mg/L	326	273	15	8419624	330	15	8419624
RDL = Reportable Detection Limit								

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		PR1131	PR1132	PR1135	PR1139		
Sampling Date		2016/09/30	2016/09/28 09:28	2016/09/28 09:54	2016/09/30		
COC Number		08427984	08427984	08427984	08427984		
	UNITS	TRIP BLANK LQTB	BC-6 LP	BC-39 LP	FIELD BLANK LQFB	RDL	QC Batch
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	<0.50	152	138	<0.50	0.50	8419744
Elements							
Total Mercury (Hg)	mg/L	<0.0000020	<0.0000020	0.0000022	<0.0000020	0.0000020	8421608
Total Metals by ICPMS							
Total Aluminum (Al)	mg/L	<0.00050	0.0206	0.00194	<0.00050	0.00050	8421292
Total Antimony (Sb)	mg/L	<0.000020	0.000173	0.000249	<0.000020	0.000020	8421292
Total Arsenic (As)	mg/L	<0.000020	0.000651	0.000314	<0.000020	0.000020	8421292
Total Barium (Ba)	mg/L	<0.000020	0.0569	0.0763	<0.000020	0.000020	8421292
Total Beryllium (Be)	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8421292
Total Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421292
Total Boron (B)	mg/L	<0.010	<0.010	<0.010	<0.010	0.010	8421292
Total Cadmium (Cd)	mg/L	<0.0000050	0.0000380	0.0000320	<0.0000050	0.0000050	8421292
Total Chromium (Cr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8421292
Total Cobalt (Co)	mg/L	<0.0000050	0.0000580	0.0000350	<0.0000050	0.0000050	8421292
Total Copper (Cu)	mg/L	<0.000050	0.000631	0.000499	<0.000050	0.000050	8421292
Total Iron (Fe)	mg/L	<0.0010	0.0529	0.0024	<0.0010	0.0010	8421292
Total Lead (Pb)	mg/L	<0.0000050	0.0000440	<0.0000050	<0.0000050	0.0000050	8421292
Total Lithium (Li)	mg/L	<0.00050	0.00226	0.00145	<0.00050	0.00050	8421292
Total Manganese (Mn)	mg/L	<0.000050	0.0106	0.000878	<0.000050	0.000050	8421292
Total Molybdenum (Mo)	mg/L	<0.000050	0.000549	0.000616	<0.000050	0.000050	8421292
Total Nickel (Ni)	mg/L	<0.000020	0.000994	0.000448	<0.000020	0.000020	8421292
Total Phosphorus (P)	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8421292
Total Selenium (Se)	mg/L	<0.000040	0.000715	0.000591	<0.000040	0.000040	8421292
Total Silicon (Si)	mg/L	<0.050	2.75	2.97	<0.050	0.050	8421292
Total Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050 (1)	0.0000050	8421292
Total Strontium (Sr)	mg/L	<0.000050	0.252	0.230	<0.000050	0.000050	8421292
Total Thallium (Tl)	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000020	8421292
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421292
Total Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8421292

RDL = Reportable Detection Limit
(1) Matrix Spike outside acceptance criteria (10% of analytes failure allowed).

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		PR1131	PR1132	PR1135	PR1139		
Sampling Date		2016/09/30	2016/09/28 09:28	2016/09/28 09:54	2016/09/30		
COC Number		08427984	08427984	08427984	08427984		
	UNITS	TRIP BLANK LQTB	BC-6 LP	BC-39 LP	FIELD BLANK LQFB	RDL	QC Batch
Total Uranium (U)	mg/L	<0.0000020	0.000833	0.000756	<0.0000020	0.0000020	8421292
Total Vanadium (V)	mg/L	<0.00020	0.00026	<0.00020	<0.00020	0.00020	8421292
Total Zinc (Zn)	mg/L	<0.00010	0.00279	0.00167	<0.00010	0.00010	8421292
Total Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8421292
Total Calcium (Ca)	mg/L	<0.050	41.7	38.2	<0.050	0.050	8419625
Total Magnesium (Mg)	mg/L	<0.050	11.8	10.4	<0.050	0.050	8419625
Total Potassium (K)	mg/L	<0.050	0.463	0.558	<0.050	0.050	8419625
Total Sodium (Na)	mg/L	<0.050	1.94	2.09	<0.050	0.050	8419625
Total Sulphur (S)	mg/L	<3.0	22.9	20.1	<3.0	3.0	8419625
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		PR1151	PR1152	PR1154	PR1165		
Sampling Date		2016/09/29 11:47	2016/09/29 15:31	2016/09/29 11:26	2016/09/28 14:42		
COC Number		08427986	08427986	08427986	08427987		
	UNITS	BC-10 LP	BC-12 LP	BC-17 LP	BC-4 LP	RDL	QC Batch
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	261	446	182	342	0.50	8419744
Elements							
Total Mercury (Hg)	mg/L	0.0000034	<0.0000020	<0.0000020	<0.0000020	0.0000020	8421608
Total Metals by ICPMS							
Total Aluminum (Al)	mg/L	0.0167	0.0240	0.00179	0.0584	0.00050	8421292
Total Antimony (Sb)	mg/L	0.105	0.146	0.138	0.00337	0.000020	8421292
Total Arsenic (As)	mg/L	0.0157	0.155	0.0406	0.00390	0.000020	8421292
Total Barium (Ba)	mg/L	0.133	0.0294	0.117	0.0729	0.000020	8421292
Total Beryllium (Be)	mg/L	<0.000010	0.000103	<0.000010	<0.000010	0.000010	8421292
Total Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421292
Total Boron (B)	mg/L	<0.010	0.023	<0.010	<0.010	0.010	8421292
Total Cadmium (Cd)	mg/L	0.0000280	0.000237	0.0000240	0.000168	0.0000050	8421292
Total Chromium (Cr)	mg/L	<0.00010	<0.00010	0.00019	0.00020	0.00010	8421292
Total Cobalt (Co)	mg/L	0.0000470	0.00401	0.0000060	0.000428	0.0000050	8421292
Total Copper (Cu)	mg/L	0.000377	0.000678	0.000129	0.000675	0.000050	8421292
Total Iron (Fe)	mg/L	0.0251	0.347	0.0019	0.359	0.0010	8421292
Total Lead (Pb)	mg/L	0.0000460	0.0000170	<0.0000050	0.000100	0.0000050	8421292
Total Lithium (Li)	mg/L	0.00374	0.00746	0.00236	0.00879	0.00050	8421292
Total Manganese (Mn)	mg/L	0.0111	0.288	0.000443	0.122	0.000050	8421292
Total Molybdenum (Mo)	mg/L	0.00414	0.00850	0.00918	0.00244	0.000050	8421292
Total Nickel (Ni)	mg/L	0.000483	0.0201	0.00162	0.00350	0.000020	8421292
Total Phosphorus (P)	mg/L	0.0077	0.0025	0.0104	0.0110	0.0020	8421292
Total Selenium (Se)	mg/L	0.00563	0.000487	0.00938	0.00449	0.000040	8421292
Total Silicon (Si)	mg/L	1.67	4.68	3.90	3.56	0.050	8421292
Total Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8421292
Total Strontium (Sr)	mg/L	0.525	0.709	0.272	0.518	0.000050	8421292
Total Thallium (Tl)	mg/L	0.0000350	0.0000530	0.0000270	0.0000130	0.0000020	8421292
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421292
Total Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	0.00220	0.00050	8421292
Total Uranium (U)	mg/L	0.0103	0.00841	0.00599	0.00339	0.0000020	8421292
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		PR1151	PR1152	PR1154	PR1165		
Sampling Date		2016/09/29 11:47	2016/09/29 15:31	2016/09/29 11:26	2016/09/28 14:42		
COC Number		08427986	08427986	08427986	08427987		
	UNITS	BC-10 LP	BC-12 LP	BC-17 LP	BC-4 LP	RDL	QC Batch
Total Vanadium (V)	mg/L	0.00021	<0.00020	<0.00020	0.00135	0.00020	8421292
Total Zinc (Zn)	mg/L	0.00055	0.0260	0.0121	0.00906	0.00010	8421292
Total Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	0.00013	0.00010	8421292
Total Calcium (Ca)	mg/L	64.2	120	50.8	83.4	0.050	8419625
Total Magnesium (Mg)	mg/L	24.4	35.4	13.4	32.6	0.050	8419625
Total Potassium (K)	mg/L	1.44	1.87	0.730	1.26	0.050	8419625
Total Sodium (Na)	mg/L	0.778	0.899	1.10	1.83	0.050	8419625
Total Sulphur (S)	mg/L	39.5	77.0	18.2	62.0	3.0	8419625
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		PR1167	PR1169		
Sampling Date		2016/09/27 15:37	2016/09/27		
COC Number		08427988	08427988		
	UNITS	BC-28A LP	DUP B LQS	RDL	QC Batch
Calculated Parameters					
Total Hardness (CaCO3)	mg/L	1350	1450	0.50	8419744
Elements					
Total Mercury (Hg)	mg/L	0.0000386	0.0000385	0.0000020	8421608
Total Metals by ICPMS					
Total Aluminum (Al)	mg/L	0.0121	0.0105	0.0025	8421292
Total Antimony (Sb)	mg/L	1.87	1.98	0.00010	8421292
Total Arsenic (As)	mg/L	0.317	0.335	0.00010	8421292
Total Barium (Ba)	mg/L	0.0365	0.0389	0.00010	8421292
Total Beryllium (Be)	mg/L	<0.000050	<0.000050	0.000050	8421292
Total Bismuth (Bi)	mg/L	<0.000025	<0.000025	0.000025	8421292
Total Boron (B)	mg/L	<0.050	<0.050	0.050	8421292
Total Cadmium (Cd)	mg/L	0.000272	0.000277	0.000025	8421292
Total Chromium (Cr)	mg/L	<0.00050	<0.00050	0.00050	8421292
Total Cobalt (Co)	mg/L	0.630	0.678	0.000025	8421292
Total Copper (Cu)	mg/L	0.00152	0.00149	0.00025	8421292
Total Iron (Fe)	mg/L	0.213	0.224	0.0050	8421292
Total Lead (Pb)	mg/L	<0.000025	<0.000025	0.000025	8421292
Total Lithium (Li)	mg/L	0.0051	0.0065	0.0025	8421292
Total Manganese (Mn)	mg/L	0.0406	0.0347	0.00025	8421292
Total Molybdenum (Mo)	mg/L	0.0183	0.0194	0.00025	8421292
Total Nickel (Ni)	mg/L	0.00851	0.00911	0.00010	8421292
Total Phosphorus (P)	mg/L	0.046	0.035	0.010	8421292
Total Selenium (Se)	mg/L	0.181	0.194	0.00020	8421292
Total Silicon (Si)	mg/L	4.44	4.81	0.25	8421292
Total Silver (Ag)	mg/L	<0.000025	<0.000025	0.000025	8421292
Total Strontium (Sr)	mg/L	1.97	2.05	0.00025	8421292
Total Thallium (Tl)	mg/L	0.000137	0.000186	0.000010	8421292
Total Tin (Sn)	mg/L	<0.0010	<0.0010	0.0010	8421292
Total Titanium (Ti)	mg/L	<0.0025	<0.0025	0.0025	8421292
Total Uranium (U)	mg/L	0.0318	0.0338	0.000010	8421292
RDL = Reportable Detection Limit					

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		PR1167	PR1169		
Sampling Date		2016/09/27 15:37	2016/09/27		
COC Number		08427988	08427988		
	UNITS	BC-28A LP	DUP B LQS	RDL	QC Batch
Total Vanadium (V)	mg/L	<0.0010	<0.0010	0.0010	8421292
Total Zinc (Zn)	mg/L	0.00912	0.00956	0.00050	8421292
Total Zirconium (Zr)	mg/L	<0.00050	<0.00050	0.00050	8421292
Total Calcium (Ca)	mg/L	394	424	0.25	8419625
Total Magnesium (Mg)	mg/L	88.1	95.2	0.25	8419625
Total Potassium (K)	mg/L	5.20	5.62	0.25	8419625
Total Sodium (Na)	mg/L	423	468	0.25	8419625
Total Sulphur (S)	mg/L	337	359	15	8419625
RDL = Reportable Detection Limit					

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		PR1130	PR1133	PR1134	PR1136	PR1137		
Sampling Date		2016/09/28 12:02	2016/09/28 13:55	2016/09/28 16:24	2016/09/27 17:53	2016/09/28 10:45		
COC Number		08427984	08427984	08427984	08427984	08427984		
	UNITS	BC-1 LP	BC-31 LP	BC-34 LP	BC-51W LP	BC-53 LP	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	256	297	260	242	256	0.50	8419744
Elements								
Total Mercury (Hg)	mg/L	<0.0000020	<0.0000020	0.0000033	0.0000070	<0.0000020	0.0000020	8421608
Total Metals by ICPMS								
Total Aluminum (Al)	mg/L	1.00	0.177	0.0298	4.48	0.367	0.0030	8421394
Total Antimony (Sb)	mg/L	0.00286	0.000758	0.000270	0.00289	0.00285	0.000020	8421394
Total Arsenic (As)	mg/L	0.00928	0.000692	0.000236	0.0161	0.00684	0.000020	8421394
Total Barium (Ba)	mg/L	0.117	0.0986	0.0532	0.0443	0.0884	0.000050	8421394
Total Beryllium (Be)	mg/L	0.000064	0.000015	<0.000010	0.0107	0.000042	0.000010	8421394
Total Bismuth (Bi)	mg/L	0.000014	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8421394
Total Boron (B)	mg/L	<0.010	0.011	<0.010	0.012	<0.010	0.010	8421394
Total Cadmium (Cd)	mg/L	0.000116	0.0000930	0.000106	0.00395	0.0000640	0.0000050	8421394
Total Chromium (Cr)	mg/L	0.00186	0.00032	0.00013	0.00098	0.00078	0.00010	8421394
Total Cobalt (Co)	mg/L	0.00176	0.000238	0.000071	0.0393	0.00117	0.000010	8421394
Total Copper (Cu)	mg/L	0.00404	0.00199	0.00145	0.215	0.00237	0.00010	8421394
Total Iron (Fe)	mg/L	1.99	0.363	0.0794	2.84	0.884	0.0050	8421394
Total Lead (Pb)	mg/L	0.00111	0.000239	0.000034	0.000157	0.000477	0.000020	8421394
Total Lithium (Li)	mg/L	0.0118	0.00717	0.00258	0.0107	0.0113	0.00050	8421394
Total Manganese (Mn)	mg/L	0.190	0.0473	0.0159	2.03	0.153	0.00010	8421394
Total Molybdenum (Mo)	mg/L	0.00299	0.00211	0.00148	<0.000050	0.00284	0.000050	8421394
Total Nickel (Ni)	mg/L	0.00633	0.00281	0.00253	0.123	0.00451	0.00010	8421394
Total Phosphorus (P)	mg/L	0.0763	0.0182	0.0104	0.0182	0.0301	0.0050	8421394
Total Selenium (Se)	mg/L	0.00211	0.00212	0.00218	0.00508	0.00206	0.000040	8421394
Total Silicon (Si)	mg/L	6.84	4.10	3.39	10.3	5.84	0.050	8421394
Total Silver (Ag)	mg/L	0.000010	<0.000010	<0.000010	0.000014	<0.000010	0.000010	8421394
Total Strontium (Sr)	mg/L	0.315	0.367	0.274	0.388	0.310	0.000050	8421394
Total Thallium (Tl)	mg/L	0.0000090	0.0000060	0.0000030	0.0000860	0.0000060	0.0000020	8421394
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421394
Total Titanium (Ti)	mg/L	0.0365	0.0044	<0.0020	<0.0020	0.0138	0.0020	8421394
Total Uranium (U)	mg/L	0.00269	0.00386	0.00167	0.00376	0.00253	0.0000050	8421394
Total Vanadium (V)	mg/L	0.00437	0.00131	0.00089	<0.00020	0.00225	0.00020	8421394
RDL = Reportable Detection Limit								

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		PR1130	PR1133	PR1134	PR1136	PR1137		
Sampling Date		2016/09/28 12:02	2016/09/28 13:55	2016/09/28 16:24	2016/09/27 17:53	2016/09/28 10:45		
COC Number		08427984	08427984	08427984	08427984	08427984		
	UNITS	BC-1 LP	BC-31 LP	BC-34 LP	BC-51W LP	BC-53 LP	RDL	QC Batch
Total Zinc (Zn)	mg/L	0.0121	0.0079	0.0107	0.340	0.0068	0.0010	8421394
Total Zirconium (Zr)	mg/L	0.00030	0.00017	<0.00010	<0.00010	0.00022	0.00010	8421394
Total Calcium (Ca)	mg/L	64.4	72.5	66.7	53.1	64.7	0.25	8419625
Total Magnesium (Mg)	mg/L	23.0	28.1	22.7	26.6	23.0	0.25	8419625
Total Potassium (K)	mg/L	1.20	0.89	0.66	1.64	1.14	0.25	8419625
Total Sodium (Na)	mg/L	3.74	1.90	1.34	0.79	3.55	0.25	8419625
Total Sulphur (S)	mg/L	41.5	43.6	40.5	94.2	41.6	3.0	8419625

RDL = Reportable Detection Limit

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		PR1138	PR1153	PR1164	PR1166		
Sampling Date		2016/09/28	2016/09/29 12:17	2016/09/29 16:26	2016/09/28 15:30		
COC Number		08427984	08427986	08427987	08427987		
	UNITS	DUP C LQS	BC-15 LP	BC-3 LP	BC-5 LP	RDL	QC Batch
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	264	598	281	320	0.50	8419744
Elements							
Total Mercury (Hg)	mg/L	0.0000027	0.0000035	0.0000029	0.0000026	0.0000020	8421608
Total Metals by ICPMS							
Total Aluminum (Al)	mg/L	0.0293	0.0074	0.236	0.136	0.0030	8421394
Total Antimony (Sb)	mg/L	0.000263	0.00455	0.00382	0.000625	0.000020	8421394
Total Arsenic (As)	mg/L	0.000219	0.0501	0.00403	0.000981	0.000020	8421394
Total Barium (Ba)	mg/L	0.0537	0.0526	0.0821	0.0988	0.000050	8421394
Total Beryllium (Be)	mg/L	<0.000010	<0.000010	0.000051	0.000015	0.000010	8421394
Total Bismuth (Bi)	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8421394
Total Boron (B)	mg/L	<0.010	<0.010	<0.010	<0.010	0.010	8421394
Total Cadmium (Cd)	mg/L	0.000102	0.0000230	0.000122	0.000117	0.0000050	8421394
Total Chromium (Cr)	mg/L	0.00012	<0.00010	0.00051	0.00052	0.00010	8421394
Total Cobalt (Co)	mg/L	0.000072	0.000036	0.00184	0.000399	0.000010	8421394
Total Copper (Cu)	mg/L	0.00153	0.00046	0.00203	0.00281	0.00010	8421394
Total Iron (Fe)	mg/L	0.0781	0.0142	0.649	0.389	0.0050	8421394
Total Lead (Pb)	mg/L	0.000040	0.000050	0.000269	0.000145	0.000020	8421394
Total Lithium (Li)	mg/L	0.00249	0.00180	0.0128	0.00444	0.00050	8421394
Total Manganese (Mn)	mg/L	0.0161	0.00736	0.165	0.102	0.00010	8421394
Total Molybdenum (Mo)	mg/L	0.00152	0.00102	0.00245	0.00299	0.000050	8421394
Total Nickel (Ni)	mg/L	0.00257	0.00062	0.00736	0.00662	0.00010	8421394
Total Phosphorus (P)	mg/L	0.0098	0.0068	0.0225	0.0261	0.0050	8421394
Total Selenium (Se)	mg/L	0.00219	0.0207	0.00211	0.00173	0.000040	8421394
Total Silicon (Si)	mg/L	3.45	2.25	5.01	4.42	0.050	8421394
Total Silver (Ag)	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8421394
Total Strontium (Sr)	mg/L	0.286	1.37	0.356	0.419	0.000050	8421394
Total Thallium (Tl)	mg/L	0.0000040	0.0000260	0.0000070	0.0000050	0.0000020	8421394
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8421394
Total Titanium (Ti)	mg/L	<0.0020	<0.0020	0.0083	0.0059	0.0020	8421394
Total Uranium (U)	mg/L	0.00170	0.00491	0.00228	0.00202	0.0000050	8421394
Total Vanadium (V)	mg/L	0.00092	<0.00020	0.00129	0.00224	0.00020	8421394
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		PR1138	PR1153	PR1164	PR1166		
Sampling Date		2016/09/28	2016/09/29 12:17	2016/09/29 16:26	2016/09/28 15:30		
COC Number		08427984	08427986	08427987	08427987		
	UNITS	DUP C LQS	BC-15 LP	BC-3 LP	BC-5 LP	RDL	QC Batch
Total Zinc (Zn)	mg/L	0.0105	0.0010	0.0120	0.0249	0.0010	8421394
Total Zirconium (Zr)	mg/L	<0.00010	<0.00010	0.00014	0.00028	0.00010	8421394
Total Calcium (Ca)	mg/L	67.0	137	70.3	68.4	0.25	8419625
Total Magnesium (Mg)	mg/L	23.5	62.3	25.7	36.1	0.25	8419625
Total Potassium (K)	mg/L	0.66	0.97	1.29	1.03	0.25	8419625
Total Sodium (Na)	mg/L	1.34	0.47	3.11	2.60	0.25	8419625
Total Sulphur (S)	mg/L	41.7	150	48.8	66.8	3.0	8419625
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		PR1168		
Sampling Date		2016/09/27 15:10		
COC Number		08427988		
	UNITS	BC-28B LP	RDL	QC Batch
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	1030	0.50	8419744
Elements				
Total Mercury (Hg)	mg/L	0.0000119	0.0000020	8421608
Total Metals by ICPMS				
Total Aluminum (Al)	mg/L	0.036	0.015	8421394
Total Antimony (Sb)	mg/L	1.57	0.00010	8421394
Total Arsenic (As)	mg/L	0.202	0.00010	8421394
Total Barium (Ba)	mg/L	0.0365	0.00025	8421394
Total Beryllium (Be)	mg/L	<0.000050	0.000050	8421394
Total Bismuth (Bi)	mg/L	<0.000050	0.000050	8421394
Total Boron (B)	mg/L	<0.050	0.050	8421394
Total Cadmium (Cd)	mg/L	0.000093	0.000025	8421394
Total Chromium (Cr)	mg/L	<0.00050	0.00050	8421394
Total Cobalt (Co)	mg/L	0.481	0.000050	8421394
Total Copper (Cu)	mg/L	0.00182	0.00050	8421394
Total Iron (Fe)	mg/L	0.095	0.025	8421394
Total Lead (Pb)	mg/L	0.00101	0.00010	8421394
Total Lithium (Li)	mg/L	0.0039	0.0025	8421394
Total Manganese (Mn)	mg/L	0.0543	0.00050	8421394
Total Molybdenum (Mo)	mg/L	0.0174	0.00025	8421394
Total Nickel (Ni)	mg/L	0.00549	0.00050	8421394
Total Phosphorus (P)	mg/L	0.032	0.025	8421394
Total Selenium (Se)	mg/L	0.141	0.00020	8421394
Total Silicon (Si)	mg/L	1.03	0.25	8421394
Total Silver (Ag)	mg/L	<0.000050	0.000050	8421394
Total Strontium (Sr)	mg/L	1.49	0.00025	8421394
Total Thallium (Tl)	mg/L	0.000130	0.000010	8421394
Total Tin (Sn)	mg/L	<0.0010	0.0010	8421394
Total Titanium (Ti)	mg/L	<0.010	0.010	8421394
Total Uranium (U)	mg/L	0.0225	0.000025	8421394
Total Vanadium (V)	mg/L	<0.0010	0.0010	8421394
RDL = Reportable Detection Limit				

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		PR1168		
Sampling Date		2016/09/27 15:10		
COC Number		08427988		
	UNITS	**BC-28B LP**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	<0.0050	0.0050	8421394
Total Zirconium (Zr)	mg/L	<0.00050	0.00050	8421394
Total Calcium (Ca)	mg/L	296	1.3	8419625
Total Magnesium (Mg)	mg/L	69.9	1.3	8419625
Total Potassium (K)	mg/L	4.5	1.3	8419625
Total Sodium (Na)	mg/L	328	1.3	8419625
Total Sulphur (S)	mg/L	269	15	8419625
RDL = Reportable Detection Limit				

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		PR1130		PR1131		PR1132	PR1133		
Sampling Date		2016/09/28 12:02		2016/09/30		2016/09/28 09:28	2016/09/28 13:55		
COC Number		08427984		08427984		08427984	08427984		
	UNITS	BC-1 LP	QC Batch	TRIP BLANK LQTB	QC Batch	BC-6 LP	BC-31 LP	RDL	QC Batch
ANIONS									
Nitrite (N)	mg/L	<0.0050 (1)	8422140	<0.0050 (1)	8422142	<0.0050 (1)	<0.0050 (1)	0.0050	8422140
Calculated Parameters									
Nitrate (N)	mg/L	0.284	8419746	<0.020	8419746	0.106	0.261	0.020	8419746
Nutrients									
Nitrate plus Nitrite (N)	mg/L	0.284 (1)	8422139	<0.020 (1)	8422141	0.106 (1)	0.261 (1)	0.020	8422139

RDL = Reportable Detection Limit
(1) Sample analysed past recommended hold time.

Maxxam ID		PR1134	PR1135		PR1136		PR1137	PR1138		
Sampling Date		2016/09/28 16:24	2016/09/28 09:54		2016/09/27 17:53		2016/09/28 10:45	2016/09/28		
COC Number		08427984	08427984		08427984		08427984	08427984		
	UNITS	BC-34 LP	BC-39 LP	QC Batch	BC-51W LP	QC Batch	BC-53 LP	DUP C LQS	RDL	QC Batch
ANIONS										
Nitrite (N)	mg/L	<0.0050 (1)	<0.0050 (1)	8422140	<0.0050 (1)	8422142	<0.0050 (1)	<0.0050 (1)	0.0050	8422140
Calculated Parameters										
Nitrate (N)	mg/L	0.200	0.092	8419746	<0.020	8419746	0.268	0.200	0.020	8419746
Nutrients										
Nitrate plus Nitrite (N)	mg/L	0.200 (1)	0.092 (1)	8422139	<0.020 (1)	8422141	0.268 (1)	0.200 (1)	0.020	8422139

RDL = Reportable Detection Limit
(1) Sample analysed past recommended hold time.

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		PR1139	PR1142	PR1143	PR1144		PR1145		
Sampling Date		2016/09/30	2016/09/27 13:15	2016/09/27 17:23	2016/09/27 14:30		2016/09/29 10:04		
COC Number		08427984	08427985	08427985	08427985		08427985		
	UNITS	FIELD BLANK LQFB	BC-19 LP	BC-21 LP	BC-22 LP	QC Batch	BC-27 LP	RDL	QC Batch
ANIONS									
Nitrite (N)	mg/L	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	8422140	<0.0050 (1)	0.0050	8422142
Calculated Parameters									
Nitrate (N)	mg/L	<0.020	0.451	<0.020	1.87	8419746	<0.020	0.020	8419746
Nutrients									
Nitrate plus Nitrite (N)	mg/L	<0.020 (1)	0.451 (1)	<0.020 (1)	1.87 (1)	8422139	<0.020 (1)	0.020	8422141

RDL = Reportable Detection Limit
(1) Sample analysed past recommended hold time.

Maxxam ID		PR1146			PR1147		PR1148		
Sampling Date		2016/09/27 12:07			2016/09/29 13:38		2016/09/29 14:52		
COC Number		08427985			08427985		08427985		
	UNITS	BC-66 LP	RDL	QC Batch	BC-67 LP	QC Batch	BC-69 LP	RDL	QC Batch
ANIONS									
Nitrite (N)	mg/L	<0.0050 (1)	0.0050	8422142	<0.0050 (1)	8422140	<0.0050 (1)	0.0050	8422142
Calculated Parameters									
Nitrate (N)	mg/L	32.7	0.40	8419746	<0.020	8419746	0.028	0.020	8419746
Nutrients									
Nitrate plus Nitrite (N)	mg/L	32.7 (2)	0.40	8422141	<0.020 (1)	8422139	0.028 (1)	0.020	8422141

RDL = Reportable Detection Limit
(1) Sample analysed past recommended hold time.
(2) Sample analysed past recommended hold time. Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		PR1149		PR1151		PR1152		PR1153		
Sampling Date		2016/09/27		2016/09/29 11:47		2016/09/29 15:31		2016/09/29 12:17		
COC Number		08427985		08427986		08427986		08427986		
	UNITS	DUP A LQS	RDL	BC-10 LP	QC Batch	BC-12 LP	QC Batch	BC-15 LP	RDL	QC Batch
ANIONS										
Nitrite (N)	mg/L	<0.0050 (1)	0.0050	<0.0050 (1)	8422140	<0.0050 (1)	8422142	<0.0050 (1)	0.0050	8422140
Calculated Parameters										
Nitrate (N)	mg/L	32.2	0.40	<0.020	8419746	0.032	8419746	0.058	0.020	8419746
Nutrients										
Nitrate plus Nitrite (N)	mg/L	32.2 (2)	0.40	<0.020 (1)	8422139	0.032 (1)	8422141	0.058 (1)	0.020	8422139

RDL = Reportable Detection Limit
(1) Sample analysed past recommended hold time.
(2) Sample analysed past recommended hold time. Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PR1154	PR1164	PR1165	PR1166		
Sampling Date		2016/09/29 11:26	2016/09/29 16:26	2016/09/28 14:42	2016/09/28 15:30		
COC Number		08427986	08427987	08427987	08427987		
	UNITS	BC-17 LP	BC-3 LP	BC-4 LP	BC-5 LP	RDL	QC Batch
ANIONS							
Nitrite (N)	mg/L	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	0.0050	8422140
Calculated Parameters							
Nitrate (N)	mg/L	1.59	0.264	0.242	0.158	0.020	8419746
Nutrients							
Nitrate plus Nitrite (N)	mg/L	1.59 (1)	0.264 (1)	0.242 (1)	0.158 (1)	0.020	8422139

RDL = Reportable Detection Limit
(1) Sample analysed past recommended hold time.

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1130
Sample ID: BC-1 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8424117	N/A	2016/10/06	David Huang
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8425274	N/A	2016/10/06	Automated Statchk
Sum of cations, anions	CALC	8425275	N/A	2016/10/06	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8424618	N/A	2016/10/06	David Huang
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1130 Dup
Sample ID: BC-1 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng

Maxxam ID: PR1131
Sample ID: TRIP BLANK LQTB
Matrix: Water

Collected: 2016/09/30
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1131
Sample ID: TRIP BLANK LQTB
Matrix: Water

Collected: 2016/09/30
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE/COL	8421628	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422141	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422142	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1131 Dup
Sample ID: TRIP BLANK LQTB
Matrix: Water

Collected: 2016/09/30
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo

Maxxam ID: PR1132
Sample ID: BC-6 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1132
Sample ID: BC-6 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1133
Sample ID: BC-31 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1133
Sample ID: BC-31 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1133 Dup
Sample ID: BC-31 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi

Maxxam ID: PR1134
Sample ID: BC-34 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1135
Sample ID: BC-39 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1136
Sample ID: BC-51W LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421628	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1136
Sample ID: BC-51W LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422141	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422142	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421092	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1137
Sample ID: BC-53 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1138
Sample ID: DUP C LQS
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1139
Sample ID: FIELD BLANK LQFB
Matrix: Water

Collected: 2016/09/30
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1139
Sample ID: FIELD BLANK LQFB
Matrix: Water

Collected: 2016/09/30
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1139 Dup
Sample ID: FIELD BLANK LQFB
Matrix: Water

Collected: 2016/09/30
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An

Maxxam ID: PR1142
Sample ID: BC-19 LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1143
Sample ID: BC-21 LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam ID: PR1144
Sample ID: BC-22 LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1144 Dup
Sample ID: BC-22 LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz

Maxxam ID: PR1145
Sample ID: BC-27 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421628	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422141	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422142	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam ID: PR1145 Dup
Sample ID: BC-27 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE/COL	8421628	N/A	2016/10/04	Balwinder Bassi
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi

Maxxam ID: PR1146
Sample ID: BC-66 LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421628	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1146
Sample ID: BC-66 LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422141	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422142	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam ID: PR1147
Sample ID: BC-67 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1148
Sample ID: BC-69 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421628	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422141	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422142	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam ID: PR1149
Sample ID: DUP A LQS
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1151
Sample ID: BC-10 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1151 Dup
Sample ID: BC-10 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo

Maxxam ID: PR1152
Sample ID: BC-12 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421860	2016/10/04	2016/10/04	Wilson Au Yueng
Conductance - water	AT/ALK	8421862	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422522	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421336	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422141	N/A	2016/10/04	Isaac Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1152
Sample ID: BC-12 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrite (N) by CFA	TRAA/COL	8422142	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421861	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421635	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1153
Sample ID: BC-15 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1154
Sample ID: BC-17 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1154
Sample ID: BC-17 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1164
Sample ID: BC-3 LP
Matrix: Water

Collected: 2016/09/29
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1165
Sample ID: BC-4 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1166
Sample ID: BC-5 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8421855	2016/10/04	2016/10/04	Wilson Au Yueng
Chloride by Automated Colourimetry	KONE/COL	8421622	N/A	2016/10/04	Balwinder Bassi
Conductance - water	AT/ALK	8421857	N/A	2016/10/04	Wilson Au Yueng
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Ion Balance	CALC	8419995	N/A	2016/10/05	Automated Statchk
Sum of cations, anions	CALC	8420463	N/A	2016/10/05	Automated Statchk
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423413	N/A	2016/10/05	Diana Cruz
Nitrate + Nitrite (N)	TRAA/COL	8422139	N/A	2016/10/04	Isaac Wang
Nitrite (N) by CFA	TRAA/COL	8422140	N/A	2016/10/04	Isaac Wang

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1166
Sample ID: BC-5 LP
Matrix: Water

Collected: 2016/09/28
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrogen - Nitrate (as N)	CALC	8419746	N/A	2016/10/05	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8421091	N/A	2016/10/04	Lucy Luo
pH Water	AT/ALK	8421856	N/A	2016/10/04	Wilson Au Yueng
Sulphate by Automated Colourimetry	KONE/COL	8421625	N/A	2016/10/04	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8421346	2016/10/04	2016/10/05	Coco Guo
Total Suspended Solids-Low Level	BAL/BAL	8421561	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1167
Sample ID: BC-28A LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam ID: PR1168
Sample ID: BC-28B LP
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8423254	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423265	N/A	2016/10/05	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8421394	2016/10/04	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: PR1169
Sample ID: DUP B LQS
Matrix: Water

Collected: 2016/09/27
Shipped:
Received: 2016/09/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8423260	N/A	2016/10/05	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8423271	N/A	2016/10/05	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8419744	N/A	2016/10/05	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8419623	N/A	2016/10/05	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8422545	N/A	2016/10/05	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8421608	2016/10/04	2016/10/04	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8419624	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8421345	N/A	2016/10/05	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8419625	N/A	2016/10/05	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8421292	N/A	2016/10/04	Andrew An
Ammonia-N (Preserved)	KONE/COL	8423416	N/A	2016/10/05	Diana Cruz
Filter and HNO3 Preserve for Metals	ICP	ONSITE	N/A	2016/10/03	Marilou H. Truant
Total Suspended Solids-Low Level	BAL/BAL	8420455	2016/10/04	2016/10/05	Wendy Fong

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.0°C
Package 2	3.3°C
Package 3	6.0°C
Package 4	3.7°C

All samples were received at analytical lab past recommended hold time for Nitrate and Nitrite.

Sample PR1130-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1133-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1134-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1136-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1137-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1138-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1153-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1164-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1166-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample PR1168-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER) Comments

Sample PR1167-03 Elements by ICPMS Low Level (dissolved): RDL raised due to sample matrix interference.
Sample PR1168-03 Elements by ICPMS Low Level (dissolved): RDL raised due to sample matrix interference.
Sample PR1169-03 Elements by ICPMS Low Level (dissolved): RDL raised due to sample matrix interference.

LOW LEVEL TOTAL METALS WITH CV HG (WATER) Comments

Sample PR1167-02 Elements by ICPMS Low Level (total): RDL raised due to sample matrix interference.
Sample PR1169-02 Elements by ICPMS Low Level (total): RDL raised due to sample matrix interference.

LL TOTAL METALS (DIGESTED) WITH CV HG Comments

Sample PR1168-02 Elements by ICPMS Digested LL (total): RDL raised due to sample matrix interference.

Sample PR1136, Elements by ICPMS Low Level (dissolved): Test repeated.
Sample PR1169, Elements by ICPMS Low Level (dissolved): Test repeated.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

QUALITY ASSURANCE REPORT

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8420455	Total Suspended Solids	2016/10/05			98	80 - 120	<1.0	mg/L		
8421092	Total Dissolved Solids	2016/10/05	100	80 - 120	110	80 - 120	<10	mg/L	2.9	20
8421292	Total Aluminum (Al)	2016/10/04	102	80 - 120	103	80 - 120	<0.00050	mg/L	NC	20
8421292	Total Antimony (Sb)	2016/10/04	99	80 - 120	102	80 - 120	<0.000020	mg/L	NC	20
8421292	Total Arsenic (As)	2016/10/04	105	80 - 120	96	80 - 120	<0.000020	mg/L	NC	20
8421292	Total Barium (Ba)	2016/10/04	100	80 - 120	103	80 - 120	<0.000020	mg/L	NC	20
8421292	Total Beryllium (Be)	2016/10/04	100	80 - 120	96	80 - 120	<0.000010	mg/L	NC	20
8421292	Total Bismuth (Bi)	2016/10/04	99	80 - 120	103	80 - 120	<0.0000050	mg/L	NC	20
8421292	Total Boron (B)	2016/10/04	97	80 - 120	95	80 - 120	<0.010	mg/L	NC	20
8421292	Total Cadmium (Cd)	2016/10/04	105	80 - 120	96	80 - 120	<0.0000050	mg/L	NC	20
8421292	Total Chromium (Cr)	2016/10/04	97	80 - 120	96	80 - 120	<0.00010	mg/L	NC	20
8421292	Total Cobalt (Co)	2016/10/04	98	80 - 120	97	80 - 120	<0.0000050	mg/L	NC	20
8421292	Total Copper (Cu)	2016/10/04	102	80 - 120	96	80 - 120	<0.000050	mg/L	NC	20
8421292	Total Iron (Fe)	2016/10/04	99	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20
8421292	Total Lead (Pb)	2016/10/04	100	80 - 120	103	80 - 120	<0.0000050	mg/L	NC	20
8421292	Total Lithium (Li)	2016/10/04	95	80 - 120	91	80 - 120	<0.00050	mg/L	NC	20
8421292	Total Manganese (Mn)	2016/10/04	98	80 - 120	96	80 - 120	<0.000050	mg/L	NC	20
8421292	Total Molybdenum (Mo)	2016/10/04	98	80 - 120	100	80 - 120	<0.000050	mg/L	NC	20
8421292	Total Nickel (Ni)	2016/10/04	101	80 - 120	97	80 - 120	<0.000020	mg/L	NC	20
8421292	Total Phosphorus (P)	2016/10/04					<0.0020	mg/L	NC	20
8421292	Total Selenium (Se)	2016/10/04	107	80 - 120	100	80 - 120	<0.000040	mg/L	NC	20
8421292	Total Silicon (Si)	2016/10/04					<0.050	mg/L	NC	20
8421292	Total Silver (Ag)	2016/10/04	77 (1)	80 - 120	91	80 - 120	<0.0000050	mg/L	NC	20
8421292	Total Strontium (Sr)	2016/10/04	99	80 - 120	94	80 - 120	<0.000050	mg/L	NC	20
8421292	Total Thallium (Tl)	2016/10/04	98	80 - 120	102	80 - 120	<0.0000020	mg/L	NC	20
8421292	Total Tin (Sn)	2016/10/04	112	80 - 120	105	80 - 120	<0.00020	mg/L	NC	20
8421292	Total Titanium (Ti)	2016/10/04	105	80 - 120	90	80 - 120	<0.00050	mg/L	NC	20
8421292	Total Uranium (U)	2016/10/04	100	80 - 120	104	80 - 120	<0.0000020	mg/L	NC	20
8421292	Total Vanadium (V)	2016/10/04	96	80 - 120	97	80 - 120	<0.00020	mg/L	NC	20
8421292	Total Zinc (Zn)	2016/10/04	116	80 - 120	99	80 - 120	<0.00010	mg/L	NC	20
8421292	Total Zirconium (Zr)	2016/10/04					<0.00010	mg/L	NC	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8421336	Dissolved Aluminum (Al)	2016/10/05	101	80 - 120	101	80 - 120	<0.00050	mg/L	NC	20
8421336	Dissolved Antimony (Sb)	2016/10/05	98	80 - 120	101	80 - 120	<0.000020	mg/L	NC	20
8421336	Dissolved Arsenic (As)	2016/10/05	97	80 - 120	95	80 - 120	<0.000020	mg/L	NC	20
8421336	Dissolved Barium (Ba)	2016/10/05	99	80 - 120	101	80 - 120	<0.000020	mg/L	NC	20
8421336	Dissolved Beryllium (Be)	2016/10/05	94	80 - 120	98	80 - 120	<0.000010	mg/L	NC	20
8421336	Dissolved Bismuth (Bi)	2016/10/05	100	80 - 120	100	80 - 120	<0.0000050	mg/L	NC	20
8421336	Dissolved Boron (B)	2016/10/05	95	80 - 120	98	80 - 120	<0.010	mg/L	NC	20
8421336	Dissolved Cadmium (Cd)	2016/10/05	98	80 - 120	94	80 - 120	<0.0000050	mg/L	NC	20
8421336	Dissolved Chromium (Cr)	2016/10/05	94	80 - 120	98	80 - 120	<0.00010	mg/L	NC	20
8421336	Dissolved Cobalt (Co)	2016/10/05	94	80 - 120	97	80 - 120	<0.0000050	mg/L	NC	20
8421336	Dissolved Copper (Cu)	2016/10/05	97	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8421336	Dissolved Iron (Fe)	2016/10/05	98	80 - 120	99	80 - 120	<0.0010	mg/L	NC	20
8421336	Dissolved Lead (Pb)	2016/10/05	100	80 - 120	101	80 - 120	<0.0000050	mg/L	NC	20
8421336	Dissolved Lithium (Li)	2016/10/05	91	80 - 120	95	80 - 120	<0.00050	mg/L	NC	20
8421336	Dissolved Manganese (Mn)	2016/10/05	94	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8421336	Dissolved Molybdenum (Mo)	2016/10/05	99	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8421336	Dissolved Nickel (Ni)	2016/10/05	96	80 - 120	98	80 - 120	<0.000020	mg/L	NC	20
8421336	Dissolved Phosphorus (P)	2016/10/05					<0.0020	mg/L	NC	20
8421336	Dissolved Selenium (Se)	2016/10/05	100	80 - 120	98	80 - 120	<0.000040	mg/L	NC	20
8421336	Dissolved Silicon (Si)	2016/10/05					<0.050	mg/L	NC	20
8421336	Dissolved Silver (Ag)	2016/10/05	91	80 - 120	94	80 - 120	<0.0000050	mg/L	NC	20
8421336	Dissolved Strontium (Sr)	2016/10/05	91	80 - 120	92	80 - 120	<0.000050	mg/L	NC	20
8421336	Dissolved Thallium (Tl)	2016/10/05	99	80 - 120	100	80 - 120	<0.0000020	mg/L	NC	20
8421336	Dissolved Tin (Sn)	2016/10/05	103	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
8421336	Dissolved Titanium (Ti)	2016/10/05	100	80 - 120	110	80 - 120	<0.00050	mg/L	NC	20
8421336	Dissolved Uranium (U)	2016/10/05	100	80 - 120	101	80 - 120	<0.0000020	mg/L	NC	20
8421336	Dissolved Vanadium (V)	2016/10/05	94	80 - 120	98	80 - 120	<0.00020	mg/L	NC	20
8421336	Dissolved Zinc (Zn)	2016/10/05	103	80 - 120	103	80 - 120	<0.00010	mg/L	NC	20
8421336	Dissolved Zirconium (Zr)	2016/10/05					<0.00010	mg/L	NC	20
8421345	Dissolved Aluminum (Al)	2016/10/05	104	80 - 120	106	80 - 120	<0.00050	mg/L	NC	20
8421345	Dissolved Antimony (Sb)	2016/10/05	102	80 - 120	102	80 - 120	<0.000020	mg/L	NC	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8421345	Dissolved Arsenic (As)	2016/10/05	100	80 - 120	98	80 - 120	<0.000020	mg/L	NC	20
8421345	Dissolved Barium (Ba)	2016/10/05	101	80 - 120	103	80 - 120	<0.000020	mg/L	1.1	20
8421345	Dissolved Beryllium (Be)	2016/10/05	98	80 - 120	97	80 - 120	<0.000010	mg/L	NC	20
8421345	Dissolved Bismuth (Bi)	2016/10/05	103	80 - 120	102	80 - 120	<0.0000050	mg/L	NC	20
8421345	Dissolved Boron (B)	2016/10/05	96	80 - 120	99	80 - 120	<0.010	mg/L	NC	20
8421345	Dissolved Cadmium (Cd)	2016/10/05	98	80 - 120	97	80 - 120	<0.0000050	mg/L	NC	20
8421345	Dissolved Chromium (Cr)	2016/10/05	97	80 - 120	97	80 - 120	<0.00010	mg/L	NC	20
8421345	Dissolved Cobalt (Co)	2016/10/05	97	80 - 120	97	80 - 120	<0.0000050	mg/L	NC	20
8421345	Dissolved Copper (Cu)	2016/10/05	97	80 - 120	95	80 - 120	<0.000050	mg/L	NC	20
8421345	Dissolved Iron (Fe)	2016/10/05	100	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20
8421345	Dissolved Lead (Pb)	2016/10/05	102	80 - 120	104	80 - 120	<0.0000050	mg/L	NC	20
8421345	Dissolved Lithium (Li)	2016/10/05	94	80 - 120	92	80 - 120	<0.00050	mg/L	NC	20
8421345	Dissolved Manganese (Mn)	2016/10/05	98	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8421345	Dissolved Molybdenum (Mo)	2016/10/05	99	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8421345	Dissolved Nickel (Ni)	2016/10/05	97	80 - 120	97	80 - 120	<0.000020	mg/L	NC	20
8421345	Dissolved Phosphorus (P)	2016/10/05					<0.0020	mg/L		
8421345	Dissolved Selenium (Se)	2016/10/05	101	80 - 120	98	80 - 120	<0.000040	mg/L	NC	20
8421345	Dissolved Silicon (Si)	2016/10/05					<0.050	mg/L	NC	20
8421345	Dissolved Silver (Ag)	2016/10/05	94	80 - 120	108	80 - 120	<0.0000050	mg/L	NC	20
8421345	Dissolved Strontium (Sr)	2016/10/05	NC	80 - 120	97	80 - 120	<0.000050	mg/L	13	20
8421345	Dissolved Thallium (Tl)	2016/10/05	102	80 - 120	103	80 - 120	<0.0000020	mg/L	NC	20
8421345	Dissolved Tin (Sn)	2016/10/05	103	80 - 120	108	80 - 120	<0.00020	mg/L	NC	20
8421345	Dissolved Titanium (Ti)	2016/10/05	89	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
8421345	Dissolved Uranium (U)	2016/10/05	104	80 - 120	104	80 - 120	<0.0000020	mg/L	NC	20
8421345	Dissolved Vanadium (V)	2016/10/05	96	80 - 120	96	80 - 120	<0.00020	mg/L	NC	20
8421345	Dissolved Zinc (Zn)	2016/10/05	106	80 - 120	97	80 - 120	<0.00010	mg/L	NC	20
8421345	Dissolved Zirconium (Zr)	2016/10/05					<0.00010	mg/L	NC	20
8421346	Total Dissolved Solids	2016/10/05	NC	80 - 120	106	80 - 120	<10	mg/L	3.7	20
8421394	Total Aluminum (Al)	2016/10/05	NC	80 - 120	109	80 - 120	<0.0030	mg/L	3.8	20
8421394	Total Antimony (Sb)	2016/10/05	108	80 - 120	102	80 - 120	<0.000020	mg/L	NC	20
8421394	Total Arsenic (As)	2016/10/05	98	80 - 120	101	80 - 120	<0.000020	mg/L	7.0	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8421394	Total Barium (Ba)	2016/10/05	NC	80 - 120	104	80 - 120	<0.000050	mg/L	1.7	20
8421394	Total Beryllium (Be)	2016/10/05	104	80 - 120	103	80 - 120	<0.000010	mg/L	NC	20
8421394	Total Bismuth (Bi)	2016/10/05	99	80 - 120	101	80 - 120	<0.000010	mg/L	NC	20
8421394	Total Boron (B)	2016/10/05	NC	80 - 120	98	80 - 120	<0.010	mg/L	2.9	20
8421394	Total Cadmium (Cd)	2016/10/05	102	80 - 120	102	80 - 120	<0.0000050	mg/L	NC	20
8421394	Total Chromium (Cr)	2016/10/05	97	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
8421394	Total Cobalt (Co)	2016/10/05	98	80 - 120	100	80 - 120	<0.000010	mg/L	8.6	20
8421394	Total Copper (Cu)	2016/10/05	92	80 - 120	104	80 - 120	<0.00010	mg/L	NC	20
8421394	Total Iron (Fe)	2016/10/05	NC	80 - 120	104	80 - 120	<0.0050	mg/L	NC	20
8421394	Total Lead (Pb)	2016/10/05	102	80 - 120	103	80 - 120	<0.000020	mg/L	NC	20
8421394	Total Lithium (Li)	2016/10/05	NC	80 - 120	97	80 - 120	<0.00050	mg/L	4.3	20
8421394	Total Manganese (Mn)	2016/10/05	NC	80 - 120	103	80 - 120	<0.00010	mg/L	4.6	20
8421394	Total Molybdenum (Mo)	2016/10/05	NC	80 - 120	100	80 - 120	<0.000050	mg/L	0.68	20
8421394	Total Nickel (Ni)	2016/10/05	93	80 - 120	100	80 - 120	<0.00010	mg/L	14	20
8421394	Total Phosphorus (P)	2016/10/05					<0.0050	mg/L		
8421394	Total Selenium (Se)	2016/10/05	108	80 - 120	108	80 - 120	<0.000040	mg/L	NC	20
8421394	Total Silicon (Si)	2016/10/05					<0.050	mg/L	10	20
8421394	Total Silver (Ag)	2016/10/05	96	80 - 120	84	80 - 120	<0.000010	mg/L	NC	20
8421394	Total Strontium (Sr)	2016/10/05	NC	80 - 120	99	80 - 120	<0.000050	mg/L	1.2	20
8421394	Total Thallium (Tl)	2016/10/05	90	80 - 120	87	80 - 120	<0.0000020	mg/L	NC	20
8421394	Total Tin (Sn)	2016/10/05	110	80 - 120	100	80 - 120	<0.00020	mg/L	NC	20
8421394	Total Titanium (Ti)	2016/10/05	73 (1)	80 - 120	100	80 - 120	<0.0020	mg/L	NC	20
8421394	Total Uranium (U)	2016/10/05	105	80 - 120	103	80 - 120	<0.0000050	mg/L	6.6	20
8421394	Total Vanadium (V)	2016/10/05	104	80 - 120	98	80 - 120	<0.00020	mg/L	NC	20
8421394	Total Zinc (Zn)	2016/10/05	116	80 - 120	117	80 - 120	<0.0010	mg/L	NC	20
8421394	Total Zirconium (Zr)	2016/10/05					<0.00010	mg/L	NC	20
8421561	Total Suspended Solids	2016/10/05			99	80 - 120	<1.0	mg/L		
8421608	Total Mercury (Hg)	2016/10/04	97	80 - 120	100	80 - 120	<0.0000020	mg/L	NC	20
8421622	Dissolved Chloride (Cl)	2016/10/04	105	80 - 120	100	80 - 120	<0.50	mg/L	NC	20
8421625	Dissolved Sulphate (SO4)	2016/10/04	NC	80 - 120	97	80 - 120	<0.50	mg/L	0.57	20
8421628	Dissolved Chloride (Cl)	2016/10/04	109	80 - 120	100	80 - 120	<0.50	mg/L	NC	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8421635	Dissolved Sulphate (SO4)	2016/10/04	NC	80 - 120	98	80 - 120	<0.50	mg/L	4.5	20
8421855	Alkalinity (PP as CaCO3)	2016/10/04					<0.50	mg/L	NC	20
8421855	Alkalinity (Total as CaCO3)	2016/10/04	NC	80 - 120	98	80 - 120	0.65, RDL=0.50	mg/L	4.1	20
8421855	Bicarbonate (HCO3)	2016/10/04					0.79, RDL=0.50	mg/L	4.1	20
8421855	Carbonate (CO3)	2016/10/04					<0.50	mg/L	NC	20
8421855	Hydroxide (OH)	2016/10/04					<0.50	mg/L	NC	20
8421856	pH	2016/10/04			102	97 - 103			0.38	N/A
8421857	Conductivity	2016/10/04			99	80 - 120	<1.0	uS/cm	0.83	20
8421860	Alkalinity (PP as CaCO3)	2016/10/04					<0.50	mg/L	NC	20
8421860	Alkalinity (Total as CaCO3)	2016/10/04	NC	80 - 120	91	80 - 120	<0.50	mg/L	1.7	20
8421860	Bicarbonate (HCO3)	2016/10/04					<0.50	mg/L	1.7	20
8421860	Carbonate (CO3)	2016/10/04					<0.50	mg/L	NC	20
8421860	Hydroxide (OH)	2016/10/04					<0.50	mg/L	NC	20
8421861	pH	2016/10/04			102	97 - 103			0.49	N/A
8421862	Conductivity	2016/10/04			101	80 - 120	<1.0	uS/cm	0	20
8422139	Nitrate plus Nitrite (N)	2016/10/04	NC	80 - 120	105	80 - 120	<0.020	mg/L	2.8	25
8422140	Nitrite (N)	2016/10/04	97	80 - 120	99	80 - 120	<0.0050	mg/L	NC	20
8422141	Nitrate plus Nitrite (N)	2016/10/04	98	80 - 120	104	80 - 120	<0.020	mg/L	NC	25
8422142	Nitrite (N)	2016/10/04	96	80 - 120	98	80 - 120	<0.0050	mg/L	NC	20
8422522	Dissolved Mercury (Hg)	2016/10/05	102	80 - 120	109	80 - 120	<0.0000020	mg/L	NC	20
8422545	Dissolved Mercury (Hg)	2016/10/05	105	80 - 120	101	80 - 120	<0.0000020	mg/L	NC	20
8423254	Strong Acid Dissoc. Cyanide (CN)	2016/10/05	99	80 - 120	100	80 - 120	<0.00050	mg/L	NC	20
8423260	Strong Acid Dissoc. Cyanide (CN)	2016/10/05	99	80 - 120	101	80 - 120	<0.00050	mg/L	NC	20
8423265	Weak Acid Dissoc. Cyanide (CN)	2016/10/05	99	80 - 120	100	80 - 120	<0.00050	mg/L	NC	20
8423271	Weak Acid Dissoc. Cyanide (CN)	2016/10/05	101	80 - 120	101	80 - 120	<0.00050	mg/L	NC	20
8423413	Total Ammonia (N)	2016/10/05	102	80 - 120	96	80 - 120	<0.0050	mg/L	3.5	20
8423416	Total Ammonia (N)	2016/10/05	NC	80 - 120	99	80 - 120			1.1	20
8424311	Dissolved Phosphorus (P)	2016/10/06					<0.0020	mg/L		

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8424311	Dissolved Thallium (Tl)	2016/10/06			99	80 - 120	0.0000030, RDL=0.0000020	mg/L		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

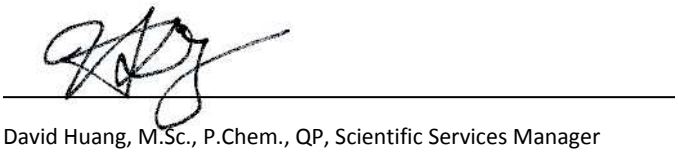
Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam Job #: B686620
Report Date: 2016/10/07

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01
Site Location: BREWERY CREEK
Sampler Initials: AB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam
A Bureau Veritas Group Company

CHAIN OF CUSTODY RECORD

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

COC: 08427984

BBY FCD-00077/05

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: ALEXCO ENVIRONMENTAL	Company Name: ALEXCO ENVIRONMENTAL	Quotation #: B50743	[x] Regular TAT 5 days (Most analyses)
Contact Name:	Contact Name: KAI WOLOSHYN	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: UNIT 3 151 INDUSTRIAL RD	Address: UNIT 3 151 INDUSTRIAL RD	Project #: GPBC-13-01	Rush TAT (Surcharges will be applied)
Whitehorse, YK PC: V1A 2V3	Whitehorse, YK PC: V1A 2V3	Site Location: Brewery Creek	[ ] Same Day [ ] 2 Days
Phone: (867) 668-6463	Phone: (867) 668-6463	Site #:	[ ] 1 Day [ ] 3 Days
Email: ap@accessconsulting.ca	Email: kwoloshyn@alexcoresource.com	Sampled By: A.Bier, É.Roy	Date Required:
			Rush Confirmation #:

Regulatory Criteria	Special Instructions
[ ] BC CSR Soil [ ] BC CSR Water	[ ] Return Cooler
[ ] CCME (Specify) [ ] Other (Specify)	[ ] Ship Sample Bottles (Please Specify)
[ ] Drinking Water [ ] BC Water Quality	USE SCENARIO # 12485

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	TOTAL LOW LEVEL METALS INCL. MERCURY	DISSOLVED LOW LEVEL METALS INCL. MERCURY	LOW LEVEL TSS & TDS	ANIONS (Cl, SO4, NO2, NO3)	AMMONIA	CYANIDE (SAD & WAD)	ROUTINE (Cond., pH, Hardness, Alkalinity)	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	BC-1 LP		2016/09/28	12:02	Water	x	x	x	x	x	x	x	7	
2	Trip Blank LQTB		N/A	N/A	Water	x	x	x	x	x	x	x	7	
3	BC-6 LP		2016/09/28	9:28	Water	x	x	x	x	x	x	x	7	
4	BC-31 LP		2016/09/28	13:55	Water	x	x	x	x	x	x	x	7	
5	BC-34 LP		2016/09/28	16:24	Water	x	x	x	x	x	x	x	7	
6	BC-39 LP		2016/09/28	9:54	Water	x	x	x	x	x	x	x	7	
7	BC-51W LP		2016/09/27	17:53	Water	x	x	x	x	x	x	x	7	
8	BC-53 LP		2016/09/28	10:45	Water	x	x	x	x	x	x	x	7	
9	Dup C LQS		2016/09/28	n/a	Water	x	x	x	x	x	x	x	7	
10	Field Blank LQFB		2016/09/30	n/a	Water	x	x	x	x	x	x	x		

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
N/A		12/1111
N/A		11/1112
N/A		11/9

COOLING MEDIA PRESENT: Y / N

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
A. Bier / A. Bier	2016/09/30	16:15	Laurel McAteer	2016/10/03	10:25

B686620_COC

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08427985

BBY FCD-00077/05

Page 2 of 5

Invoice Information		Report Information (if differs from invoice)		Project Information (wh		Turnaround Time (TAT) Required
Company Name:	ALEXCO ENVIRONMENTAL	Company Name:	ALEXCO ENVIRONMENTAL	Quotation #:	B50743	x Regular TAT 5 days (Most analyses)
Contact Name:		Contact Name:	KAI WOLOSHYN	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	UNIT 3 151 INDUSTRIAL RD	Address:	UNIT 3 151 INDUSTRIAL RD	Project #:	GPBC-13-01	Rush TAT (Surcharges will be applied)
	Whitehorse, YK PC: V1A 2V3		Whitehorse, YK PC: V1A 2V3	Site Location:	Brewery Creek	Same Day / 2 Days
Phone:	(867) 668-6463	Phone:	(867) 668-6463	Site #:		1 Day / 3 Days
Email:	ap@accessconsulting.ca	Email:	kwoloshyn@alexcoresource.com	Sampled By:	A.Bier, É.Roy	Date Required:

Regulatory Criteria: BC CSR Soil; BC CSR Water; CCME (Specify); Other (Specify); Drinking Water; BC Water Quality

Special Instructions: Return Cooler; Ship Sample Bottles (Please Specify); USE SCENARIO # 12485

Rush Confirmation #:

LABORATORY USE ONLY

CUSTODY SEAL Y / N (N circled)

Present	Intact	COOLER TEMPERATURES
NA		12 / 11 / 11
NA		11 / 11 / 12
NA		11 / 11 / 10

COOLING MEDIA PRESENT (Y) / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	DISSOLVED LOW LEVEL METALS INCL. MERCURY	LOW LEVEL TDS	ANIONS (Cl, SO4, NO2, NO3)	AMMONIA	CYANIDE (SAD & WAD)	ROUTINE (Cond., pH, Alkalinity)	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	BC-19 LP		2016/09/27	13:15	Water	x	x	x	x	x	x	6		D. Metals Field Filtered
2	BC-21 LP		2016/09/27	17:23	Water	x	x	x	x	x	x	6		
3	BC-22 LP		2016/09/27	14:30	Water	x	x	x	x	x	x	6		D. Metals Field Filtered
4	BC-27 LP		2016/09/29	10:04	Water	x	x	x	x	x	x	6		
5	~~BC-65 LP~~				~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~6~~		
6	BC-66 LP		2016/09/27	12:07	Water	x	x	x	x	x	x	6		D. Metals Field Filtered
7	BC-67 LP		2016/09/29	13:38	Water	x	x	x	x	x	x	6		
8	~~BC-68 LP~~				~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~6~~		
9	BC-69 LP		2016/09/29	14:52	Water	x	x	x	x	x	x	6		
10	~~BC-70 LP~~				~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~6~~		
11	DUP A LQS		2016/09/27	n/a	Water	x	x	x	x	x	x			

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
A.Bier / A. Bier	2016/09/30	16:15	Maurel Gauthier	2016/10/03	10:25

B686620_COC

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08427986

BBY FCD-00077/05

Invoice Information	Report Information (if differs from invoice)	Project Information (w	Turnaround Time (TAT) Required
Company Name: ALEXCO ENVIRONMENTAL	Company Name: ALEXCO ENVIRONMENTAL	Quotation #: B50743	[x] Regular TAT 5 days (Most analyses)
Contact Name:	Contact Name: KAI WOLOSHYN	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: UNIT 3 151 INDUSTRIAL RD	Address: UNIT 3 151 INDUSTRIAL RD	Project #: GPBC-13-01	Rush TAT (Surcharges will be applied)
Whitehorse, YK PC: V1A 2V3	Whitehorse, YK PC: V1A 2V3	Site Location: Brewery Creek	[ ] Same Day [ ] 2 Days
Phone: (867) 668-6463	Phone: (867) 668-6463	Site #:	[ ] 1 Day [ ] 3 Days
Email: ap@accessconsulting.ca	Email: kwoloshyn@alexcoresource.com	Sampled By: A.Bier, É.Roy	Date Required:

Regulatory Criteria	Special Instructions
[ ] BC CSR Soil [ ] BC CSR Water	[ ] Return Cooler
[ ] CCME (Specify) [ ] Other (Specify)	[ ] Ship Sample Bottles (Please Specify)
[ ] Drinking Water [ ] BC Water Quality	USE SCENARIO # 12485

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	TOTAL LOW LEVEL METALS INCL. MERCURY	DISSOLVED LOW LEVEL METALS INCL. MERCURY	LOW LEVEL TSS & TDS	ANIONS (SO4, NO2, NO3)	AMMONIA	ROUTINE (Cond., pH, Alkalinity)	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	BC-10 LP		2016/09/29	11:47	Water	x	x	x	x	x	x	6		
2	~~BC-11 LP~~				~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~6~~		
3	BC-12 LP		2016/09/29	15:31	Water	x	x	x	x	x	x	6		
4	BC-15 LP		2016/09/29	12:17	Water	x	x	x	x	x	x	6		Labelled at BC-14, please report as BC-15
5	~~BC-16 LP~~				~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~6~~		
6	BC-17 LP		2016/09/29	11:26	Water	x	x	x	x	x	x	6		
7	~~BC-18 LP~~				~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~6~~		
8														
9														

LABORATORY USE ONLY

CUSTODY SEAL Y / N

Present	Intact	COOLER TEMPERATURES
NA		12/11
NA		11/11.2
NA		11.9

COOLING MEDIA PRESENT Y / N

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD	TIME: (HH:MM)
ABier / A.Bier	2016/09/30	16:15	Laurel Berthier	2016/10/03	10:25

B686620_COC

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC # 08427987

BBY FCD-00077/05

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: ALEXCO ENVIRONMENTAL	Company Name: ALEXCO ENVIRONMENTAL	Quotation #: B50743	[x] Regular TAT 5 days (Most analyses)
Contact Name:	Contact Name: KAI WOLOSHYN	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: UNIT 3 151 INDUSTRIAL RD	Address: UNIT 3 151 INDUSTRIAL RD	Project #: GPBC-13-01	Rush TAT (Surcharges will be applied)
Whitehorse, YK PC: V1A 2V3	Whitehorse, YK PC: V1A 2V3	Site Location: Brewery Creek	[ ] Same Day [ ] 2 Days
Phone: (867) 668-6463	Phone: (867) 668-6463	Site #:	[ ] 1 Day [ ] 3 Days
Email: ap@accessconsulting.ca	Email: kwoloshyn@alexcoresource.com	Sampled By: A.Bier, É.Roy	Date Required:

Regulatory Criteria	Special Instructions
[ ] BC CSR Soil [ ] BC CSR Water	[ ] Return Cooler
[ ] CCME (Specify) [ ] Other (Specify)	[ ] Ship Sample Bottles (Please Specify)
[ ] Drinking Water [ ] BC Water Quality	USE SCENARIO # 12485

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

Rush Confirmation #:

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	TOTAL LOW LEVEL METALS INCL. MERCURY	DISSOLVED LOW LEVEL METALS INCL. MERCURY	LOW LEVEL TSS & TDS	ANIONS (Cl, SO4, NO2, NO3)	AMMONIA	ROUTINE (Cond., pH, Hardness, Alkalinity)	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	BC-3 LP		2016/09/29	16:26	Water	x	x	x	x	x	x	6	
2	BC-4 LP		2016/09/28	14:42	Water	x	x	x	x	x	x	6	
3	BC-5 LP		2016/09/28	15:30	Water	x	x	x	x	x	x	6	
4													
5													
6													
7													
8													
9													

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
NA		12/11
NA		11/12
NA		11/13

COOLING MEDIA PRESENT Y / N

COMMENTS

RECEIVED IN WHITEHORSE
BY: Shyma @ 16:15
2016-09-30

cool #

TEMP: 3/3 | 3/3 | 3/4 → 1 2
6/4 | 7/3 | 5/4 → 3 4

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
A Bier / A. Bier	2016/09/30	16:15	Laurel Bellhouse	2016/10/03	10:25

B686620_COC

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08427988

BBY FCD-00077/05

Invoice Information	Report Information (if differs from invoice)	Project Information (wi... applicable)	Turnaround Time (TAT) Required
Company Name: ALEXCO ENVIRONMENTAL	Company Name: ALEXCO ENVIRONMENTAL	Quotation #: B50743	[x] Regular TAT 5 days (Most analyses)
Contact Name:	Contact Name: KAI WOLOSHYN	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: UNIT 3 151 INDUSTRIAL RD	Address: UNIT 3 151 INDUSTRIAL RD	Project #: GPBC-13-01	Rush TAT (Surcharges will be applied)
Whitehorse, YK PC: V1A 2V3	Whitehorse, YK PC: V1A 2V3	Site Location: Brewery Creek	[ ] Same Day [ ] 2 Days [ ] 1 Day [ ] 3 Days
Phone: (867) 668-6463	Phone: (867) 668-6463	Site #:	Date Required:
Email: ap@accessconsulting.ca	Email: kwoloshyn@alexcoresource.com	Sampled By: A.Bier, É.Roy	Rush Confirmation #:

Regulatory Criteria	Special Instructions
[ ] BC CSR Soil [ ] BC CSR Water	[ ] Return Cooler
[ ] CCME (Specify) [ ] Other (Specify)	[ ] Ship Sample Bottles (Please Specify)
[ ] Drinking Water [ ] BC Water Quality	USE SCENARIO # 12485

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	TOTAL LOW LEVEL METALS INCL. MERCURY	DISSOLVED LOW LEVEL METALS INCL. MERCURY	LOW LEVEL TSS	AMMONIA	CYANIDE (SAD & WAD)	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	~~BC-28 LP~~		~~2016/09/27~~		~~Water~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~5~~		
2	BC-28a LP		2016/09/27	15:37	Water	x	x	x	x	x	5		D. Metals filtered in field
3	BC-28b LP		2016/09/27	15:10	Water	x	x	x	x	x	5		D. Metals filtered in field
4	DUP B LQS		2016/09/27	n/a	Water	x	x	x	x	x	5		D. Metals filtered in field
5													
6													
7													
8													
9													

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
NA		12.1 / 11.1
NA		11.1 / 11.2
NA		11.6 / 11.2

COOLING MEDIA PRESENT Y / N

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
A.Bier / A. Bier.	2016/09/30	16:15	Laurel Graham	2016/10/03	10:25

B686620_COC

APPENDIX C

FIELD REPORTS

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 633-4882
www.accessconsulting.ca

Memorandum

To: Yukon Water Board

From: Anthony Bier, Access Consulting Group

CC: Mike Maslowski, Golden Predator

Date: July 1, 2016

Re: Brewery Creek QZ96-007 WUL Compliance Environmental Data Collection, June 2016

1 INTRODUCTION

This letter report describes the field work conducted for Golden Predator Canada Corp. (GPCC) at the Brewery Creek Property by Alexco Environmental Group (AEG) on June 29th, 2016, as required under Schedule B-3 of Water Licence QZ96-007, Amendment 8.

AEG personnel deployed from Whitehorse to Brewery Creek on June 29th by truck. The objective of this trip was to complete water quality and discharge, or level monitoring, as required under WUL QZ96-007, Amendment 8 Shedule B-3 for sites scheduled as semi-annual including BC-28, BC-28A, BC-28B, BC-65 and BC-66 and to sample sites on Laura Creek at BC-1, BC-53 and BC-37 to support an update to the Lower Laura Creek study which will be issued with the annual report.

Water quality samples, in-situ observations, discharge measurements and level observations were completed over two days, June 29th and 30th, 2016 and AEG personnel returned to Whitehorse on June 30th, 2016. Results for water licence compliance site are reported below and in a separate spreadsheets titled “GPBC Field Data June 2016” and “Brewery Creek June 2016 Lab Results”.

2 COMPLIANCE MINE WATER MONITORING

BC-28 was not flowing as there is no discharge from pond 3: the water level was low. BC-28A is the discharge from the heap into the first pond which is by way of a valve. The valve was opened at 1505h and sampled at 1800 to purge the line as much as possible. BC-28B was sampled on the southeast side of the pond as the overflow channel to pond 3 was not flowing.

All water samples were preserved and filtered in the field, except for dissolved metals which are done in the lab, and kept cool with ice packs prior to shipping to Maxxam Analytics Inc. All sites were analyzed for the following parameters:

- Total suspended and dissolved solids;
- Ammonia;
- Cyanide;
- Total and dissolved metals (suite of 33 metals, at low level detection limits).

QA/QC samples were collected or prepared as follows:

- A trip blank was carried throughout the trip and analysed at Maxxam for quality assurance;
- A field blank was collected and BC-37 on June 30th for quality control and assurance;
- A duplicate sample was collected at BC-28A and labelled "Dup-2".

Lab results from Maxxam Analytics are contained in a separate spreadsheet titled "Brewery Creek June 2016 Lab Results" submitted to the Yukon Water Board via Waterline.

2.1 IN-SITU WATER QUALITY DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip with dissolved oxygen being calibrated daily. Table 1 presents those results.

Table 1 Baseline Surface In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)	Comments
BC-28A	29-Jun-16	18:00	4.5	82	9.6	4170	7.43	330.4	Purged from 1505h to 1800h, valve reclosed
BC-28B	29-Jun-16	17:36	21.1	102	8.2	3227	8.09	320.3	Sampled from Pond 2 south east side

3 COMPLIANCE GROUNDWATER MONITORING

BC-65 and BC-66 "land application piezometers" were visited on June 29th and a sample was optained from BC-66 while BC-65 was dry. Well conditions are contained in Table 2.

Table 2 Baseline Groundwater well conditions, Sept/Oct 2015

Station	Date	Time	Depth to Water (m)	Total Depth (m)	Samples Collected (Y/N)	Volume Purged (L)	Method	Comments
BC-65	29-Jul-16	17:10	-	66.58	N	-	-	Frosty muck on end of sensor
BC-66	29-Jul-16	16:40	45.95	66.95	Y	140	Pump	Parameters stable prior to sampling

All water samples were preserved and filtered in the field, except for dissolved metals which are done in the lab, and kept cool with ice packs prior to shipping to Maxxam Analytics Inc. All sites were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness);
- Total suspended solids;
- Ammonia;
- Anions (nitrite, nitrate, chloride, sulphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Dissolved metals (suite of 33 metals, at low level detection limits).

QA/QC samples were collected or prepared as follows:

- A trip blank was carried throughout the trip and analysed at Maxxam for quality assurance;
- A field blank was collected and BC-37 on June 30th for quality control and assurance;
- A set of duplicate samples (full suite of parameters) was collected at station BC-66 and labeled "Dup-1".

Lab results from Maxxam Analytics are contained in a separate spreadsheet titled "Brewery Creek June 2016 Lab Results" submitted to the Yukon Water Board via Waterline.

3.1 IN SITU DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip with dissolved oxygen being calibratded daily (Table 3). Data were obtained from a bucket while water was being pumped in after the desired purge volume was reached.

Table 3 Groundwater In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)
BC-66	29-Jun-16	16:40	5.5	7	0.9	257.6	7.23	257.6

4 PHOTOGRAPHS

Photographs were taken throughout the trip and are stored digitally on a cloud based server. Below is a selection of highlights. More photos are available upon request.

Photo 1: BC-28, dry

Photo 2: BC-28A

Photo 3: Pond 3, near BC-28B sample site

Photo 4: Pond 3

Photo 5: Pumping BC-66

5 CLOSURE

We trust that this letter report satisfactorily describes those activities carried out to ensure compliance of Golden Predator with the terms of Water Licence QZ96-007, Amendment 8 and those sites specified to be sampled semi-annually. The annual sampling will be carried out later in the year. Please do not hesitate to contact AEG with any question you may have.

Report prepared by:

Anthony Bier
Hydrologist

June 29, 2016
Date

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 633-4882
www.accessconsulting.ca

Memorandum

To: Yukon Water Board

From: Anthony Bier, Alexco Environmental Group

CC: Janet Lee Sheriff, Golden Predator

Date: October 28, 2016

Re: Brewery Creek QZ96-007 WUL Compliance Environmental Data Collection, September 2016

1 INTRODUCTION

This letter report describes the field work conducted for Golden Predator Canada Corp. (GPCC) at the Brewery Creek Property by Alexco Environmental Group (AEG) from September 26th to 30th, 2016, as required under Schedule B-3 of Water Licence QZ96-007, Amendment 8.

AEG employees Anthony Bier and Éliane Roy deployed from Whitehorse to Brewery Creek on September 26th by truck with ATVs for on site access. Trans North Helicopters were chartered from Dawson City on September 28th to access remote sites. The objective of this trip was to complete water quality and discharge, or level monitoring, as required under WUL QZ96-007, Amendment 8 Shedule B-3.

Water quality samples, in-situ observations, discharge measurements and level observations were completed over three days from September 27th through 29th, 2016 and AEG personnel returned to Whitehorse on September 30th, 2016.

2 SURFACE WATER QUALITY AND HYDROLOGY

During the 2016 annual sampling event the following surface water sites listed in Schedule B-3 of WUL QZ96-007 Amendment 8 were visited and sampled accordingly: BC-1, BC-3, BC-4, BC-5, BC-6 BC-10, BC-12, BC-15, BC-17, BC-28, BC-28A, BC-28B, BC-31, BC-34, BC-39, BC-51W and BC-53. There was no channel ice at any sites and only trace amounts of snow at higher elevations.

Samples were stored in coolers outdoors or a fridge as necessary, since temperatures fluxuated near zero for the duration of the event. Samples were submitted to Maxxam Analytics in Whitehorse upon returning from

the site. No samples were field filtered. Samples analysed for mercury, cyanide and ammonia were preserved in the field. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids (TSS/TDS);
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total) where applicable; and
- Total and dissolved metals (suite of 33 metals, including all parameters found in the CCME and MMER guidelines).

Lab results from Maxxam Analytics are contained in a separate spreadsheet provided to the Water Board via Waterline titled "Brewery Creek Sept 2016 Lab Results". In comparison to Part G of the water license, small selenium exceedences were observed at BC-31 and BC-34 and iron was exceeded at BC-31. However, it has been previously documented that upstream reference stations tend to exceed at the same time and elevated selenium levels for this area are well established in the historic baseline data. This will be addressed further in the 2016 annual report.

2.1 IN-SITU SURFACE WATER QUALITY DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip and calibrated daily for dissolved oxygen. Table 1 presents those results.

Table 1 Baseline Surface In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)
BC-1	28-Sep	11:57	0	98	13.5	487.5	8.09	413.5
BC-3	29-Sep	16:21	1.2	93	12.4	524.9	8.05	337.2
BC-4	28-Sep	14:39	1.3	94	12.2	611.7	7.75	353.3
BC-5	28-Sep	15:26	0.2	95	13	518.4	8.01	376.9
BC-6	28-Sep	9:25	2.2	95	12.5	296	7.12	437.5
BC-31	28-Sep	13:50	0.3	99	13.5	534.9	8.2	405.7
BC-34	28-Sep	16:20	1.8	102	13.4	476.3	8.09	385.7
BC-39	28-Sep	9:50	3.4	62	7.8	272.3	7.13	435.9
BC-53	28-Sep	10:40	0	97	13.5	491.2	8.08	421.5

2.2 HYDROMETRIC DATA

The traditional velocity-area method (VA) was used for discharge measurements at all stations, utilizing a Marsh-McBirney Flo-Mate 2000 electromagnetic velocity meter. Staff gauge observations (where applicable) are the median number between the start and end of the discharge measurement.

Discharge measurements conducted at surface water sites during the trip are presented in Table 22.

Table 2 Discharge Measurements

Station	Date	Time	Staff Gauge (m)	Discharge (m^3/sec)	RPD (%)	Method
BC-1	28-Sep	12:58	0.399	0.1591	-	VA
BC-3	29-Sep	16:45	-	0.1148	-	VA
BC-4	28-Sep	14:57	-	0.0381	-	VA
BC-5	28-Sep	15:47	0.273	0.1719	-	VA
BC-31	28-Sep	14:07	0.632	0.8562	-	VA
BC-34	28-Sep	16:45	-	2.662	-	VA
BC-53	28-Sep	11:20	-	0.1239	5.2	VA

3 GROUNDWATER MONITORING

There are seven single groundwater wells plus two nested installations for a total of 11 groundwater monitoring wells which require annual sampling under QZ96-007, of which seven were sampled successfully. A Grundfos submersible pump and a 2000W Honda generator were used to obtain samples from the wells. Table 3 below outlines the conditions at each well, the sampling method and the purge volume.

Table 3 Baseline Groundwater well conditions, September 2016

Station	Date	Time	Depth to Water (m)	Total Depth (m)	Volume Purged (L)	Samples Collected (Y/N)	Method	Comments
BC-19	27-Sep	13:15	36.283	57.49	70	Y	Pump	-
BC-21	27-Sep	17:25	31.215	80.13	180	Y	Pump	-
BC-22	27-Sep	14:30	47.13	120.75	250	Y	Pump	4" well
BC-27	29-Sep	10:45	8.505	17.7	90	Y	Pump	-
BC-65	27-Sep	10:46	DRY	65.68	-	N	-	-
BC-66	27-Sep	12:07	45.454	127.362	200	Y	Pump	-
BC-67	29-Sep	13:38	38.907	51.34	80	Y	Pump	-
BC-68D	29-Sep	14:00	60.34	76.08	-	N	-	Obstructed
BC-68S	29-Sep	14:00	33.175	33.26	-	N	-	-

BC-69D	29-Sep	14:52	34.485	41.75	50	Y	Pump	-
BC-69S	29-Sep	14:35	DRY	16.23	-	N	-	-

Samples analysed for mercury, cyanide and ammonia were preserved in the field. All samples were kept cool with ice packs prior to shipping to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Dissolved metals (suite of 33 metals, at low level detection limits).

Lab results from Maxxam Analytics are contained in a separate spreadsheet provided to the Water Board via Waterline titled "Brewery Creek Sept 2016 Lab Results". No license exceedences were observed at BC-66 and BC-65 did not have water present.

3.1 IN SITU GROUNDWATER QUALITY DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip and calibrated daily for dissolved oxygen. Data were obtained from a small bucket while water was being pumped through following sample collection. Parameters were noted at intervals until stabilization at which time the sample was collected.

Table 4 Baseline Groundwater In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)
BC-19	27-Sep	13:15	2.3	2	0.3	1184	6.46	341.5
BC-21	27-Sep	17:25	3.3	11	1.4	1176	6.7	228.1
BC-22	27-Sep	14:30	2.4	5	0.6	1450	5.36	310.9
BC-27	29-Sep	10:45	4.2	2	-	822	7.21	131
BC-66	27-Sep	12:07	3.7	6	0.8	709.7	7.28	256.2
BC-67	29-Sep	13:38	5.5	3	-	481	6.79	343
BC-69D	29-Sep	14:52	4.7	1	0.2	800	6.98	368.3

4 COMPLIANCE MINE WATER MONITORING

There are twelve mine water related sites that require monitoring under QZ96-007 including pit water/discharge and effluent from the heap. Seven of those twelve sites had water present. Several are reclaimed areas that no longer have runoff or standing water. Those sites with "discharge" in their description tend to only have standing pit water. Finally, one additional site, BC-70 which is a shallow subsurface water lysimeter does not fit the surface or ground water definition. BC-70 was dry. It is not known why BC-70 fails to accumulate water, the above ground installation has been checked for obvious damage.

Some observations from sites visited:

- Lucky pit and dump sites, BC-18N and BC-18S, do not have water present. These sites have been reclaimed; BC-18N is a dry flat area and BC-18S is a grassy reclaimed hillslope with trees starting to fill in. These sites should be removed from the monitoring schedule.

- Pacific gulch, BC-16, is the overflow draining from Pacific pit. This channel is dry and appears to have been for some time. Previous evidence of spring runoff eroding the road and flowing down this gulch has been repaired, but this water would not be associated with Pacific Pit.

- BC-11, Blue Waste Dump, is a reclaimed waste rock storage area with a 0.5 meter soil cover with no signs of surface water running at any time of year, it is being rapidly reclaimed by trees.

- BC-28 was observed at the waypoint for this site which is a culvert on the access road below Pond #3 (overflow pond). Pond 3 does have water but this water infiltrates rather than flowing from the pond.

All water samples were collected raw, except mercury and cyanide samples which were preserved in the field, and kept cool prior to shipping to Maxxam Analytics Inc. All sites were analyzed for the following parameters with the exception of effluent sites (BC-28, BC-28A and BC-28B) for which anions, alklainity, routine, dissolved metals and TDS are not measured:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate); and
- Total and dissolved metals (suite of 33 metals, at low level detection limits).

Lab results from Maxxam Analytics are contained in a separate spreadsheet provided to the Water Board via Waterline titled "Brewery Creek Sept 2016 Lab Results". No exceedences were observed at BC-28A or BC-28B with regard to site specific guidelines.

4.1 IN SITU DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip and calibrated daily for DO. Table 4 presents these results.

Table 5 Compliance Surface and Mine-Realted Sites In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)	Comments
BC-10	29-Sep	11:39	4.9	82	9.5	462	8.22	301	
BC-12	29-Sep	15:24	6.2	65	7.1	867	7.7	367	
BC-15	29-Sep	12:13	3.7	79	9.5	995	8.11	321.1	
BC-17	29-Sep	11:20	2.5	85	10.5	329.9	7.71	288.2	
BC-28	27-Sep	12:30	-	-	-	-	-	-	
BC-28A	27-Sep	15:28	4	99	11.7	4050	7.46	387.2	Valve leaks slightly, but was purged for ~15 mins prior to sampling
BC-28B	27-Sep	15:04	6.7	102	11.3	3296	7.36	388	
BC-51W	27-Sep	17:48	5.9	98	11.2	647	3.74	429	

5 QA/QC PROGRAM

QA/QC samples were collected or prepared as follows:

- Field duplicates – A set of duplicate samples (full suite of parameters) was collected at monitoring well BC-66 and labeled "DupA". Samples were collected simultaneously with BC-66 samples. A second set of duplicate samples labelled "DupB" was collected from station BC-28A. "DupC" was collected from station BC-34.
- Field blanks – A set of field blanks were processed on the tailgate of the truck and labelled "Field blank". The DI water batch # was 091916-0919.
- Trip blank – Trip blanks provided by Maxxam were carried throughout the trip and were not opened. The trip blank batch # was B675025.

The QA/QC did not result in any flags or necessitate any re-analysis.

6 PHOTOGRAPHS

Photographs were taken throughout the trip and are located on the AEG server. Below is a selection of highlights. More photos are available upon request.

Photo 1: BC-1

Photo 2: BC-2, no flowing water

Photo 3: BC-6, South Klondike downstream of Lee Creek

Photo 4: BC-34 , Lee Creek near North Fork Road Bridge

Photo 5: BC-18N, Dry

Photo 6: BC-10 Kokanee Pit


Photo 7: Blue Pit, near BC-12


Photo 8: BC-15, Moosehead Pit


Photo 9: BC-16, drainage to Pacific Gulch (Dry)


Photo 10: BC-39, looking downstream


Photo 11: BC-70, empty Blue Lysimeter


Photo 12: Pond 3 (front) and pond 2 (behind)

APPENDIX D

IMPACT STUDY OF LOWER LAURA CREEK

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 633-4882
www.alexcoenv.com

Memorandum

To: Janet Lee-Sheriff, Golden Predator Exploration Ltd.

From: Marie Ducharme and Leia Fougere, Alexco Environmental Group Inc.

CC: Kai Woloshyn Alexco Environmental Group Inc.

Date: February 17, 2017

Re: Lower Laura Creek 2016 Impact Study

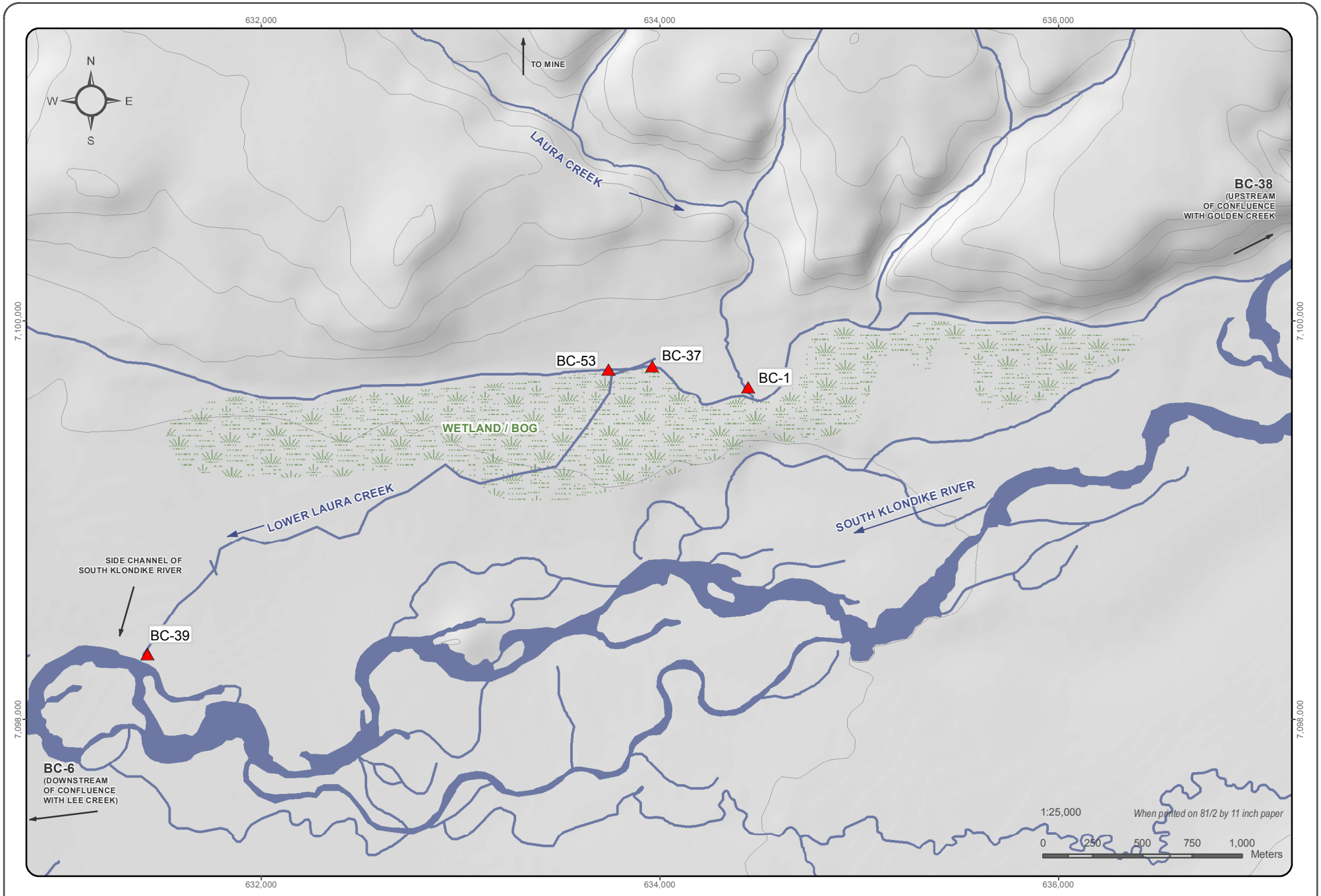
INTRODUCTION

In April 2004, the Laura Creek Adaptive Management Plan (AMP) was prepared in response to Clause 70 of Water Use Licence QZ96-007 Amendment No. 6. The AMP is a component of the overall Environmental Management System for the site and provides a contingency response plan to address downstream effects to aquatic resources in lower Laura Creek resulting from the release of mine site effluents containing selenium.

In December 2004, a Lower Laura Creek Impact Study Plan was developed, to be undertaken during the period 2005 – 2007 on the lower reach of Laura Creek from BC-53 to BC-39 (Figure 4-1), an approximate distance of three kilometres. Following the initial study phase, the commitment to update the Impact Study every three years was a clause (79) added to the Water Use Licence (QZ96-007). The impact study is updated on the monitoring data as per the schedule in Schedule B of the water license. This memo provides an updated assessment with the new data collected between 2014-2016.

PURPOSE

The purpose of the study was to characterize the potential effects to Lower Laura Creek and the South Klondike River resulting from the release of effluents from the project. The following report summarizes data collected as part of the licensed monitoring program conducted on Laura Creek and the South Klondike River during the period 2008 – 2016.



Datum: NAD 83; Map Projection: UTM Zone 7N

▲ Water Quality Stations

ALEXCO ENVIRONMENTAL GROUP

BREWERY CREEK MINE

FIGURE 1-1
LOWER LAURA CREEK STUDY AREA

JANUARY 2017

D:\Project\AllProjects\BreweryCreek\Maps\1-Overview_Maps\WQ_Stations\05-SpecificAreas\LauraCreek\SWQ_Laura_Crk_ImpactStudy_20170125.mxd (*Last edited by: mducharme;1/25/2017;08:05 AM*)

WATER QUALITY ANALYSIS

Water samples have been collected at BC-39 as per Water Licence QZ96-007, Schedule B, and also at BC-53 for the analysis of pH, conductivity, hardness, alkalinity, dissolved solids, suspended solids, sulfate, ammonia, nitrate and ICP total metals. In-situ measurements (temperature, pH, and conductivity) are also collected during sampling events.

Water quality data have also been collected at other stations on lower Laura Creek (BC-1 and BC-37) as well as in the South Klondike River (BC-38 and BC-6). Data collected for these stations are presented in Appendix B of the 2016 Annual Water Licence Report.

A discussion of water quality at BC-39 and BC-53 is provided below, followed by a comparison of selected parameters also measured at BC-1, BC-6, BC-37, and BC-38.

CCME GUIDELINES

The following discussion compares water quality parameters at stations on Laura Creek and the South Klondike River to the Canadian Council of Ministers of the Environment (CCME) guidelines to provide an idea of overall water quality in lower Laura Creek (these guidelines are presented in Table 2-1). Several water quality guidelines vary on the basis of water hardness (e.g., cadmium, copper, lead and nickel; CCME 2012). In such cases, the guideline is measured for each sample, as reflected in the Table 2-2 and Table 2-3, the water quality plots, and in Appendix B of the 2016 Annual Water Licence Report. For the aluminum guideline, pH dependent, the guideline of 0.005 mg/L was used, as all pH results are above 6.5.

A site-specific water quality objective (SSWQO) consistent with CCME guidelines was developed for selenium in the Laura Creek watershed. As per Clause 45 of the Water Licence, the maximum concentration of selenium should not exceed 0.0038 mg/L at station BC-39. The Laura Creek AMP (2004) indicates a site-specific selenium objective of 0.0038 mg/L at BC-53 will be a trigger under the AMP.

In February 2014, new guidelines for short term and long term exposure to cadmium were published by the CCME to replace the interim guideline. The long term exposure guideline is the most conservative and is used in the assessment below.

In 2003 the CCME guideline for mercury was revised from 0.0001 mg/L to 0.000026 mg/L. The laboratory Method Detection Limit (MDL) for mercury ranges from 0.01 – 0.00001 mg/L for the samples collected from 2008 – 2013. Whether or not mercury met the CCME guideline at stations BC-39 and BC-53 on all occasions is not known given the samples where the laboratory detection limit is greater than the guideline. However, results for total mercury at BC-39 were either non-detect or below CCME on all occasions, while at BC-53 they are known to exceed CCME on only two occasions.

Table 2-1: CCME Guidelines for Protection of Aquatic Life

Parameter	Concentration	Units	Notes
Aluminum	0.1	mg/L	if pH >= 6.5
	0.005	mg/L	if pH < 6.5
Arsenic	0.005	mg/L	
Cadmium (Long Term Exposure)	$(10^{0.83[\log(\text{hardness})]-2.46})/1000$	mg/L	
Chromium	0.001	mg/L	
Copper	$(e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2)/1000$	mg/L	
Iron	0.3	mg/L	
Lead	$(e^{1.273[\ln(\text{hardness})]-4.705})/1000$	mg/L	
Mercury	0.000026	mg/L	
Molybdenum	0.073	mg/L	
Nickel	$(e^{0.76[\ln(\text{hardness})]+1.06})/1000$	mg/L	
Nitrate ($N\text{-}NO_{3)}$	3	mg/L	
pH	6.5-9.0	pH units	
Selenium	0.001	mg/L	
Silver	0.00025	mg/L	
Thallium	0.0008	mg/L	
Zinc	0.03	mg/L	

Table 2-2 Water Quality Data for BC-53; Laura Creek 300 m below BC-37

Paramter	Unit		BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53	BC-53
			Jan	Apr	May	Jun	Jul	Aug	Sep	Dec	Jun	Sep	Dec	Jun	Sep	Jun	Sep	Jun	Jul	Oct	May	Oct	Sep	Jun	Sep
		Guideline	2008	2008	2008	2008	2008	2008	2008	2008	2009	2009	2009	2010	2010	2011	2011	2012	2013	2013	2014	2014	2015	2016	2016
Field Parameters																									
Conductivity (field)	µS/cm			755	271				344		1185	452	290	429				369							
pH (field)		6.5-9		7.85	7.69				7.42		7.4	7.76	8.09	7.92				8.12	8.82	8.36	8.08	7.91	7.97	8.02	8.08
Temperature (field)	C			0.2	0				3		2	4	0.1	6.3				4.5	8.18	0.1	0.6	-0.2	1.6	9.2	0
Other Parameters																									
pH (lab)		6.5-9	7.38	8.05	7.9	8.1	7.72	7.98	8.08	8.07	8.3	8.1	8.1	8.1	8.23	7.99	8.16	8.15	8.07	7.95	8.02	8.12	8.07	8.18	8.11
Conductivity (lab)	µS/cm		700	1100	349	480	304	310	386	584	430	441	586	454	435	442	460	383	390	382	427	445	393	342	514
Hardness (from total)	mg/L		406	598	184	254	322	164	210	304	214	225	302	226	220	213	221	199	181	197	216	238	197	178	256
Alkalinity, Total	mg/L		216	283	79	134	84	97	114	168	110	130	170	130	130	110	130	107	108	99.7	113	118	102	98.9	133
Alkalinity, Hydroxide OH	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alaklinity, Carbonate CO3	mg/L		<6	<6	<6	<6	<6	<6	<6	<6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alkalinity, Bicarbonate HCO3	mg/L		263	346	100	160	100	100	140	200	140	150	200	160	150	140	150	131	131	122	138	144	125	121	162
Total Dissolved Solids	mg/L		562	946	270	352	234	274	312	502	280	270	350	300	270	300	320	254	236	276	276	314	276	212	354
Total Suspended Solids	mg/L		<2	<2	<2	18	231	126	38	<2	64	9	1	110	24	65	7	67.9	37.9	29.6	43.3	2.2	15	85.7	33.5
Chloride	mg/L	120	0.78	1.93	1.19	0.59	0.32	0.37	0.75	0.51	1.2	<0.5	<0.5	0.8	<0.5	1	1	1	<0.50	1	0.79	1.1	0.76	0.75	1.1
Sulphate, Dissolved	mg/L		210	428	78.5	124	68.3	63.4	97	158	100	94	120	110	110	110	115	86.9	99.7	100	103	110	91	76.9	141
Ammonia Total	mg/L	0.197	0.01	0.013	0.012	0.008	0.032	0.021	0.024	0.08	<0.005	<0.005	0.007			0.016	0.02	0.01	0.023	0.027	0.012	0.012	0.017	0.016	0.037
Nitrate, as N	mg/L	3	0.04	<0.02	4.44	0.5	0.85	0.43	1.03	0.1	0.19	0.24	0.23	0.16	0.14	0.22	0.14	0.356	0.116	<1.0	0.263	0.164	0.326	0.091	0.268
Cyanide, Total	mg/L		0.001	0.002	0.017	0.001	0.76	0.001	0.002	0.001	0.0011	<0.0005	<0.0005	0.001	<0.0005	<0.0005	<0.0005			0.00107	0.00055	<0.00050	<0.00050	0.00062	0.0006
Cyanide, Weak Acid Dissociable	mg/L	0.005	0.002	<0.002	0.004	0.004	0.122	0.002	<0.002	<0.002	0.0007	<0.0005	<0.0005	0.0007	0.001	<0.0005	<0.0005	0.00106	0.00066	0.00095	0.00059	<0.00050	<0.00050	0.00063	0.00051
Total Metals, CCME Regulated																									
Aluminum (Al), Total	mg/L	*	0.013	0.013	10.6	0.942	8.26	2.86	0.616	0.158	0.459	0.0844	0.0207	0.556	0.0347	0.344	0.0682	0.79	0.25	0.103	0.204	0.0249	0.215	1.08	0.367
Arsenic (As), Total	mg/L	0.005	0.0045	0.0081	0.0387	0.0053	0.0178	0.0076	0.0039	0.004	0.0066	0.00406	0.00438	0.00602	0.00379	0.00669	0.00443	0.00622	0.00345	0.00316	0.00526	0.00342	0.0034	0.00482	0.00684
Cadmium (Cd), Total	mg/L	*	0.00014	0.00024	0.00077	0.00007	0.00046	0.00016	0.00007	0.00004	0.000142	0.000039	0.000026	0.000122	0.000016	0.000144	0.000035	0.000169	0.000054	0.000047	0.000072	0.000008	0.000044	0.000086	0.000064
Chromium (Cr), Total	mg/L	0.001	0.0008	0.0012	0.0222	0.0021	0.0159	0.0056	0.0021	<0.0005	0.0012	0.0002	0.0001	0.0012	0.0002	0.0008	0.0003	0.00138	0.00053	0.00037	0.00034	0.00023	0.00068	0.0021	0.00078
Copper (Cu), Total	mg/L	*	0.001	0.002	0.025	0.007	0.019	0.007	0.002	<0.001	0.00334	0.00157	0.00062	0.00353	0.00129	0.00344	0.00139	0.00513	0.00215	0.00206	0.00248	0.00123	0.00227	0.00421	0.00237
Iron (Fe), Total	mg/L	0.3	<0.1	<0.1	16.8	1.14	17.5	3.32	1.06	0.16	1.16	0.244	0.058	1.15	0.106	0.854	0.211	1.65	0.504	0.283	0.556	0.0937	0.435	2.18	0.884
Lead (Pb), Total	mg/L	*	0.0002	0.0001	0.0083	0.0007	0.0121	0.0016	0.0006	0.0001	0.00128	0.000167	0.00004	0.000949	0.000027	0.000993	0.000102	0.00147	0.000438	0.000154	0.00048	0.000009	0.000233	0.00121	0.000477
Mercury (Hg), Total		0.000026	<0.0001	<0.0001	0.001	<0.0001	0.0001	<0.0001	<0.00001	<0.0001	0.00002		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001			<0.000010	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Molybdenum (Mo), Total	mg/L	0.073	0.004	0.004	0.003	0.004	0.003	0.002	0.00234	0.003	0.00256	0.0027	0.00376	0.00237	0.00262	0.0022	0.00222	0.00155	0.00179	0.0018	0.00269	0.00269	0.00229	0.00161	0.00284
Nickel (Ni), Total	mg/L	*	0.0011	0.002	0.0281	0.0025	0.0196	0.0088	0.002	0.0019	0.0049	0.00216	0.00128	0.00388	0.0022	0.00357	0.00245	0.0048	0.00209	0.00483	0.00232	0.00214	0.00291	0.00385	0.00451
Selenium (Se), Total	mg/L	0.0038	0.0028	0.0044	0.004	0.0012	0.0031	0.0017	0.0012	0.002	0.00165	0.00159	0.00217	0.00197	0.00152	0.0018	0.00174	0.00229	0.00136	0.00132	0.00159	0.0017	0.00176	0.00116	0.00206
Silver (Ag), Total	mg/L	0.00025	<0.0001	<0.00001	0.00019	<0.00001	0.00017	0.00006	0.00002	<0.00001	<0.000005	<0.000005	<0.000005	0.000008	<0.000005	0.000012	<0.000005	1.22E-05	<0.0000050	<0.0000050	0.000005	<0.0000050	0.000007	0.000018	<0.000010
Thallium (Tl), Total	mg/L	0.0008					0.0001	<0.00005	0.00001		0.00001	0.000004	0.000003	0.000009	0.000003	0.000007	0.000003	8.3E-06	0.000003	0.000004	0.000002	0.000002	0.000005	0.000013	0.000006
Zinc (Zn), Total	mg/L	0.03	0.024	0.02	0.108	0.011	0.085	0.022	0.008	0.007	0.0155	0.0027	0.0014	0.0101	0.0007	0.0094	0.0021	0.0109	0.00372	0.00458	0.00405	0.0006	0.0046	0.0096	0.0068
Total Metals, Anions																									
Calcium (Ca), Total	mg/L		99.3	140	45.5	61.5	76.1	40.5	52.6	75.5	54	56.4	74.4	54.1	53.8	52.6	53.9	50.6	44.8	47	54	58.1	49	47.2	64.7
Manganese (Mn), Total	mg/L		0.005	0.029	0.826	0.047	0.441	0.092	0.0541	0.027	0.137	0.0252	0.0122	0.0755	0.0108	0.118	0.0397	0.104	0.0501	0.0509	0.0837	0.0308	0.0452	0.086	0.153
Magnesium (Mg), Total	mg/L		38.5	60.2	17.2	24.3	32.1	15.3	19.1	28.1	19.3	20.5	28.2	22	20.8	19.9	21.1	17.7	16.7	19.3	19.6	22.5	18.2	14.5	23
Sodium (Na), Total	mg/L		8	11.9	12.3	5	4240	3.1	4.8	4.7	3.57	3.61	4.48	3.56	3.38	3.32	3.28	3.07	2.96	3.52	3.49	3.86	3.58	2.56	3.55
Potassium (K), Total	mg/L		2.5	4.8	2.8	1.4	5.5	1.2	1.28	1.3	1.32	1.17	1.36	1.26	1.15	1.32	1.16	1.02	0.928	0.998	1.26	1.2	1.09	0.76	1.14

CCME Guideline for Aquatic life (first column): Results or detection limits above the CCME guideline are flagged in red. For Selenium, results above the SSWQO have been flagged.

The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

Table 2-3 Water Quality Data for BC-39; Laura Creek in side channel of South Klondike River

Sattion			BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39	BC-39
			May	Jun	Jul	Aug	Jun	Jun	Jan	Jul	Oct	May	Oct	Sep	Sep
		Guideline	2008	2008	2008	2008	2009	2011	2013	2013	2013	2014	2014	2015	2016
Field Paramters															
Conductivity (field)	µS/cm						1059								
pH (field)	pH units	6.5-9					7.27		7.73	7.83	8.23	7.6	7.01	7.48	7.13
Temperature (field)	C						6		0.48	7.2	2	3.2	2.4	4.5	3.4
Other Parameters															
pH (lab)	pH units	6.5-9	7.86	8	7.73	7.98	8.3	7.97	7.9	7.83	7.99	7.88	7.7	7.94	7.68
Conductivity (lab)	µS/cm		262	477	299	299	400	415	342	256	283	294	302	273	289
Hardness (from total)	mg/L		129	253	296	155	196	200	169	109	141	144	158	138	138
Alkalinity, Total	mg/L		73	133	82	94	110	110	97.5	74.2	83	81.9	87.9	79.7	90.4
Alkalinity, Hydroxide OH	mg/L		<5	<5	<5	<5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alaklinity, Carbonate CO3	mg/L		<6	<6	<6	<6	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alkalinity, Bicarbonate HCO3	mg/L		90	160	100	100	130	130	119	90.6	101	100	107	97.3	110
Total Dissolved Solids	mg/L		204	354	226	272	270	280	186	148	172	192	146	156	186
Total Suspended Solids	mg/L		<2	8	8	7	20	2	<1.0	7.7	1.5	1.7	1.1	<1.0	3.4
Chloride	mg/L	120	0.46	0.56	0.31	0.28	1.2	0.8	0.64	<0.50	0.53	<0.50		0.67	0.61
Sulphate, Dissolved	mg/L		58.7	124	67.1	61.2	97	98	75.9	50.7	61.4	62.9	63.2	54.3	64
Ammonia Total	mg/L	0.197	0.025	0.017	0.013	0.017	<0.005	0.017	0.013	0.035	0.011	0.0067	0.0096	0.0099	0.0067
Nitrate, as N	mg/L	3	0.52	0.44	0.8	0.41	0.15	0.05	0.242	0.043	<1.0	0.104	0.132	0.0643	0.092
Cyanide, Total	mg/L		0.002	0.002	0.003	0.002	0.0011	<0.0005			<0.00050	<0.00050		<0.00050	<0.00050
Cyanide, Weak Acid Dissociable	mg/L	0.005	0.002	0.004	0.002	0.002	0.0007	<0.0005	0.00071	<0.00050	0.00076	<0.00050		<0.00050	0.0006
Total Metals, CCME Regulated															
Aluminum (Al), Total	mg/L	*	0.336	0.364	0.749	0.521	0.0897	0.0339	0.00472	0.0116	0.0058	0.00284	0.00195	0.00296	0.00194
Arsenic (As), Total	mg/L	0.005	0.0033	0.0043	0.0038	0.0035	0.00357	0.00241	0.00051	0.000387	0.000623	0.000347	0.000535	0.000335	0.000314
Cadmium (Cd), Total	mg/L	*	0.00008	0.00004	0.00004	0.00004	0.000037	0.000054	0.000028	0.000031	0.000025	0.000031	0.000007	0.000031	0.000032
Chromium (Cr), Total	mg/L	0.001	0.0013	0.001	0.002	0.0017	0.0003	0.0002	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu), Total	mg/L	*	0.004	0.002	0.004	0.003	0.00118	0.00113	0.000328	0.000805	0.000526	0.000558	0.000357	0.00057	0.000499
Iron (Fe), Total	mg/L	0.3	0.3	0.41	2.01	0.61	0.221	0.065	0.0126	0.0244	0.023	0.0092	0.0063	0.0053	0.0024
Lead (Pb), Total	mg/L	*	0.0007	0.0003	0.0008	0.0002	0.000165	0.000062	0.000006	0.000047	0.00001	0.00001	<0.0000050	0.000014	<0.0000050
Mercury (Hg), Total	mg/l	0.000026	<0.00001	<0.00001	<0.00001	<0.0001	0.00001	<0.00001	<0.000010		<0.000010	<0.0000020	<0.0000020	<0.0000020	0.0000022
Molybdenum (Mo), Total	mg/L	0.073	0.002	0.003	0.002	0.002	0.00234	0.00177	0.000594	0.000573	0.000519	0.000679	0.00069	0.000678	0.000616
Nickel (Ni), Total	mg/L	*	0.003	0.0009	0.0032	0.0033	0.00157	0.00132	0.00102	0.000459	0.000695	0.000579	0.000416	0.000438	0.000448
Selenium (Se), Total	mg/L	0.0038	0.0013	0.0013	0.0015	0.0014	0.00126	0.00108	0.000857	0.000533	0.000584	0.000635	0.000642	0.000568	0.000591
Silver (Ag), Total	mg/L	0.00025	0.00002	<0.00001	0.00004	0.00002	<0.000005	<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Thallium (Tl), Total	mg/L	0.0008			<0.00005	<0.00005	0.000003	<0.000002	<0.0000020	<0.0000020	0.000002	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Zinc (Zn), Total	mg/L	0.03	0.02	0.007	0.008	0.007	0.0016	0.0012	0.00176	0.00137	0.00173	0.0021	0.00055	0.0017	0.00167
Total Metals, Anions															
Calcium (Ca), Total	mg/L		32.3	61.9	73.5	38.4	49.9	50.4	46.1	29.9	38.1	39	42.6	37.6	38.2
Manganese (Mn), Total	mg/L		0.01	0.015	0.038	0.016	0.0134	0.00475	0.00641	0.00237	0.00676	0.000473	0.000517	0.000873	0.000878
Magnesium (Mg), Total	mg/L		11.7	24	27.5	14.3	17.4	17.9	13	8.33	11.1	11.2	12.6	10.6	10.4
Sodium (Na), Total	mg/L		2.9	4.8	8.9	2.9	3.15	2.96	2.27	1.96	2.07	2.36	2.65	2.25	2.09
Potassium (K), Total	mg/L		1.2	1.4	2.2	0.9	1.24	1.31	0.497	0.589	0.483	0.596	0.707	0.623	0.558

CCME Guideline for Aquatic life (first column): Results or detection limits above the CCME guideline are flagged in red. For Selenium, results above the SSWQO have been flagged.
The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

LOWER LAURA CREEK WATER QUALITY

Selenium

The selenium SSWQO was exceeded at BC-53 during two sampling events, April and May of 2008 (0.0044 mg/L and 0.004 mg/L respectively), but has been well below the SSWQO in all data collected since 2008 (Figure 2-1). Of the total samples collected between 2008 and 2016, the selenium concentrations ranged from 0.0012 and 0.0044 mg/L, with an average concentration of 0.002 mg/L.

Selenium results at BC-39 were consistently well below the SSWQO, with concentrations ranging from 0.0005 to 0.0015 mg/L. The average concentration of selenium during this period was 0.0009 mg/L.

At stations on Laura Creek above the lower Laura Creek Study area (BC-1 and BC-37), selenium was below the SSWQO of 0.0038 mg/L during every sampling event from 2008 – 2016, with the exception of one monitoring event at BC-37, in April 2008, when the SSWQO was exceeded (0.005 mg/L).

The concentration of total selenium in the South Klondike River upstream of Laura Creek (BC-38) was below the CCME guideline of 0.001 mg/L for all but one sample (0.00116 mg/L), observed in February 2013. In the South Klondike River below Laura Creek (BC-6), seventeen samples out of forty-two (~47% of samples) were above the CCME guideline; however, all were below the selenium licence condition for BC-39. At BC-6, the dataset showed an average selenium concentration of 0.001mg/L, which was only marginally above the CCME guideline, and well below the licence condition for BC-39.

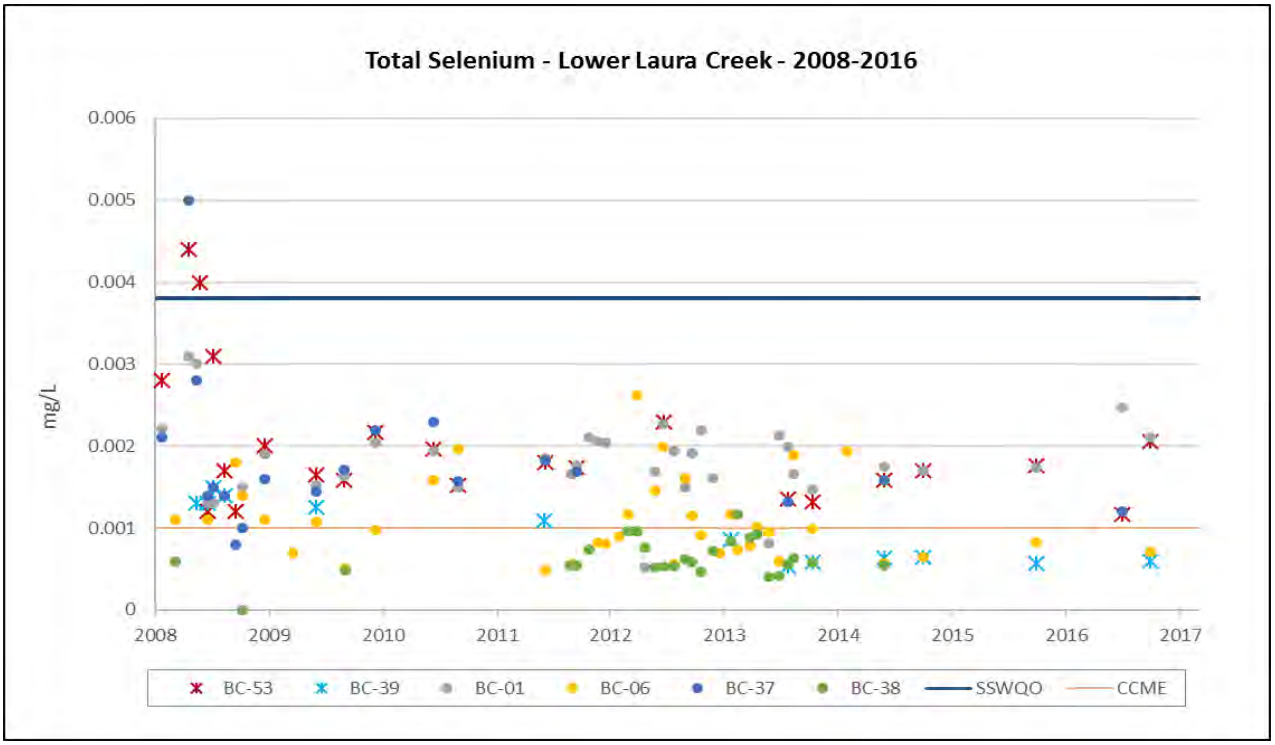


Figure 2-1: Total Selenium lower Laura Creek, 2006-2016.

Aluminum

Total aluminum exceeded the CCME guideline (0.1 mg/L) sixteen of twenty-three sampling events at BC-53 (~31% of samples). The average concentration of aluminum was 1.2 mg/L. A maximum concentration of 10.6 mg/L was observed on May 24th, 2008. This sample likely represents high-energy erosional conditions during freshet. Samples collected at BC-39 for 13 May 2008 (during the same sampling event), show an aluminum concentration of 0.336 mg/L. This indicates that freshet likely began in late May. Figure 2-2 shows the total aluminum results at BC-53.

Total aluminum exceeded the CCME guideline on four of thirteen sampling events at BC-39 (~44% of samples). The average concentration of aluminum for the nine samples is 0.0165 mg/L. A maximum concentration of 0.749 mg/L was observed in July 2008. There have been no exceedances of the aluminum guideline since 2008.

At stations on Laura Creek above the lower Laura Creek Study area (BC-1 and BC-37), the CCME aluminum guideline was regularly exceeded (>65% of the time at both BC-1 and BC-37).

Aluminum concentrations in the South Klondike River exceeded the CCME guidelines on three occasions upstream and two occasions downstream of the Brewery Creek property. All the exceedances occurred on April and May of 2012 and 2013, and were therefore likely caused by natural sediment loading associated with spring freshet.

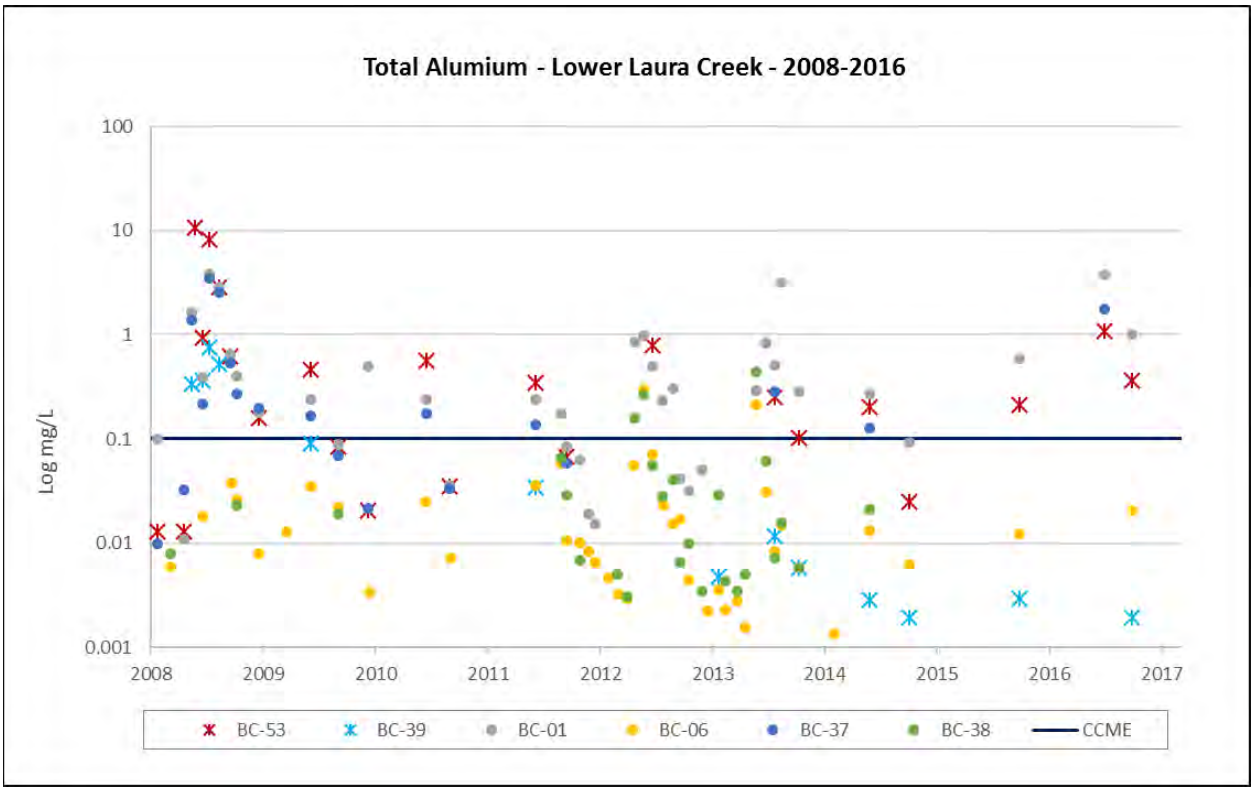


Figure 2-2: Total Aluminum, lower Laura Creek 2006-2016

Cadmium

The new CCME long term guideline for total cadmium recommends the use of the formula:

$$CWQG = (10^{\{0.83(log[hardness])-2.46\}})/1000$$

On Figure 2-2, the cadmium results for all station are shown, as well as the calculated CCME long term guidelines for BC-53, for BC-37 and for BC-06. The guideline was exceeded twice at BC-53, out of twenty-three samples (~9% of samples), both times in 2008. The maximum cadmium concentration observed at BC-53 was 0.00078 mg/L, in May 2008 and average concentration at BC-53 is 0.00013 mg/L. There have been no exceedances of the cadmium guideline since 2008.

All cadmium results at BC-39 were well below the guideline. The average cadmium concentration at BC-39 was 0.000037 mg/L.

Total cadmium levels exceeded the guideline at sample stations BC-1 on two occasions (~5% of samples), in April and May 2012 (0.000176, and .000329 mg/L, respectively). No exceedances were observed at station BC-37. On the South Klondike River, one exceedance was observed at BC-38, upstream of the Brewery Creek property (4% of samples) and two downstream at the BC-6 (~7% of samples).

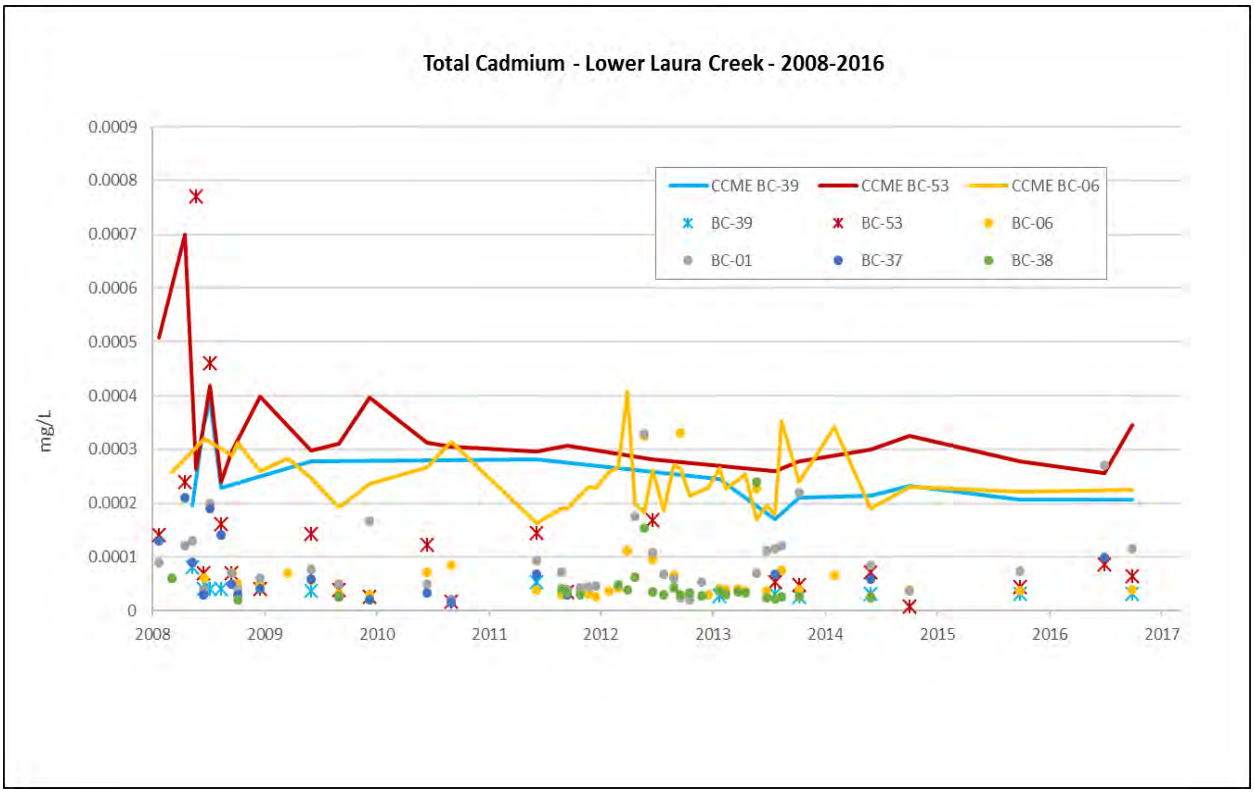


Figure 2-3: Total Cadmium – lower Laura Creek 2008 - 2016

Chromium

Total chromium exceeded the CCME guideline of 0.001 mg/L on ten of twenty-three sampling events at BC-53 (~43% of samples), with a maximum concentration of 0.022 mg/L in May 2008 (Figure 2-4). The average concentration was 0.0026 mg/L.

Total chromium at BC-39 exceeded the CCME guideline on three of thirteen sampling events (~23% of samples), with a maximum concentration of 0.002 mg/L observed in July 2008, and an average of 0.00055 mg/L. There have been no exceedances of the cadmium guideline since 2008.

At BC-1 total chromium exceeded the CCME guideline in fifteen of the thirty-eight samples collected between January 2008 and September 2016 (~39% of samples). Total chromium concentrations at BC-1 during this period ranged from 0.0001 to 0.0075 mg/L and average 0.0014 mg/L.

Samples collected at BC-37 exceeded the CCME on six of nineteen occasions (~32% of samples), range from 0.0001 to 0.0070 mg/L and average 0.0014 mg/L. The South Klondike River samples were all below the CCME guideline for total chromium, except for the March 2008 sample from BC-6.

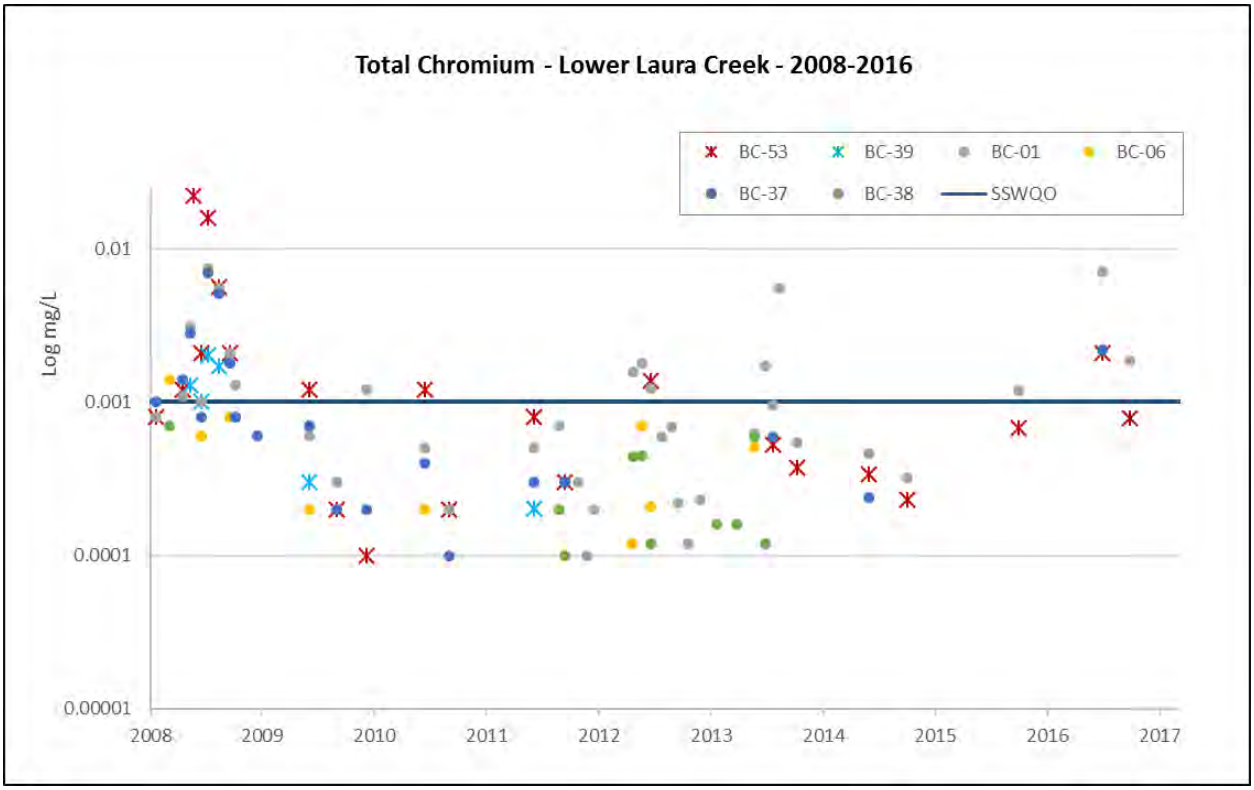


Figure 2-4: Total Chromium - lower Laura Creek 2008-2016

Copper

The CCME guideline for total copper varies slightly between sites as the guideline is an equation dependent on hardness, as provided in Table 2-1. Figure 2-5 displays the hardness dependant guidelines for BC-53, BC-37 and BC-6.

Total copper exceeded the CCME guideline six of twenty-three times at BC-53 (~26% of samples), and once out of thirteen sampling events at BC-39 (~7% of samples).

The CCME guideline for total copper was exceeded eleven times out of thirty-eight at BC-1 (~29% of samples) and four times out of nineteen at BC-37 (21% of samples). On the South Klondike River, the CCME guideline was exceeded twice upstream (8% of samples) and twice downstream (~5% of samples) of the Brewery Creek property. The exceedances occurred in May 2012 and May 2013 at both sites and were likely caused by natural sediment loading associated with spring freshet. Note that aluminum was also found to be elevated during the same sampling events.

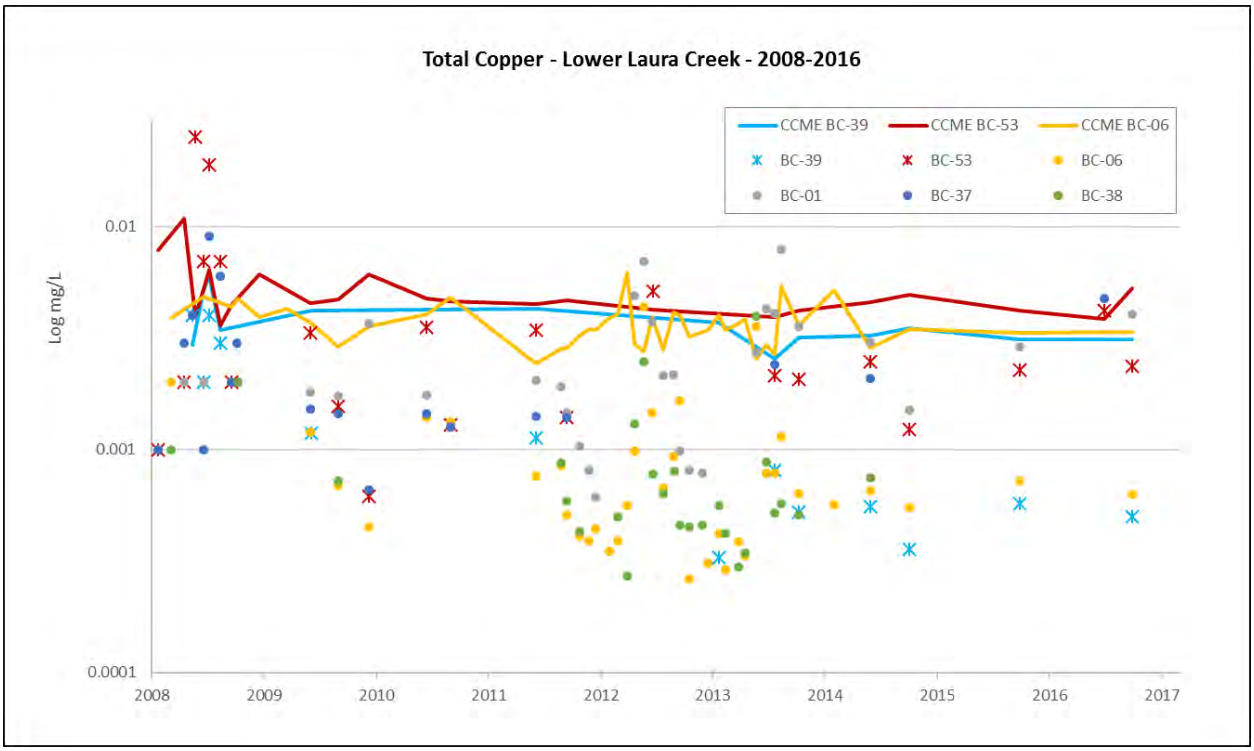


Figure 2-5: Total Copper - lower Laura Creek 2008-2016

Iron

Total iron exceeded the CCME guideline of 0.3 mg/L on fourteen of the twenty-three sampling events at BC-53 (~61% of samples). The average concentration of total iron over this period was approximately 2.20 mg/L. Results are shown on Figure 2-6.

Total iron exceeded the CCME guideline during three of the thirteen sampling events at BC-39 (~23% of samples). The average concentration of total iron during this time was approximately 0.28 mg/L. A maximum concentration of 2.01 mg/L was observed in July 2008 (see Figure 2-6).

The CCME guideline for total iron was exceeded twenty-five times out of thirty-eight at BC-1 (~66% of samples) and twelve times out of nineteen at BC-37 (63% of samples). The CCME guideline for total iron was exceeded twice in the South Klondike River upstream of the Brewery Creek property (8% of samples) and twice downstream (~5% of samples).

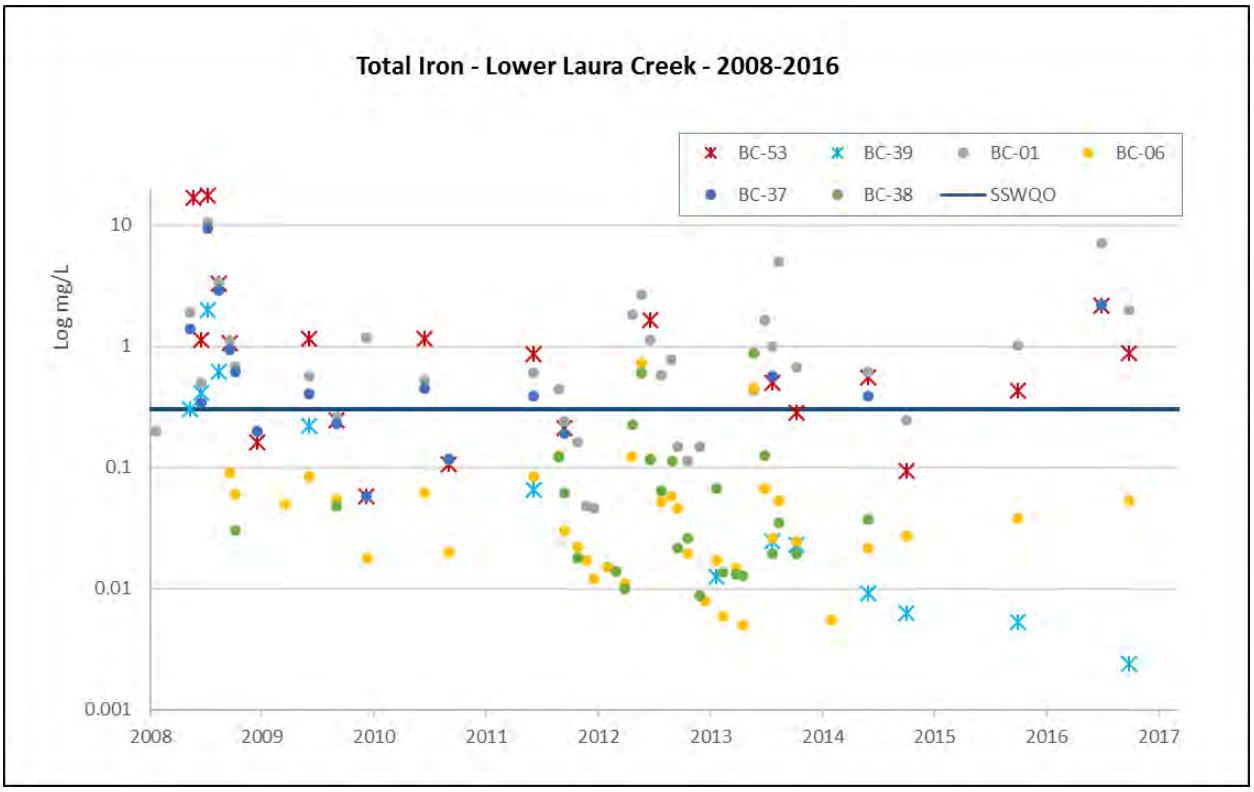


Figure 2-6: Total Iron - lower Laura Creek 2008-2016

HYDROLOGY

Laura Creek hydrology exhibits a typical seasonal pattern that has remained mostly unchanged over the years. During the winter months (October to April) no flow measurements are generally taken as the flow is minimal or zero. It has been documented over the years that Laura Creek typically goes to ground between the Klondike Ditch Road and the South Klondike River at various times of the year. Table 3-1 presents stream discharge results taken in Laura Creek since 2006.

Table 3-1: Stream Discharge Measurements in Laura Creek, 2006-2016 (m^3/s)

Date	BC-1	BC-37	BC-39	BC-53
29-Aug-06	0.181	-	-	-
1-May-07	-	-	1.176	0.121
1-Jun-07	0.164	-	0.072	-
1-Aug-07	0.111	-	0.032	0.044
1-Sep-07	0.998	0.052	0.037	0.158
18-Jun-08	0.066	-	0.002	-
9-Jul-08	0.124	-	-	-
12-Aug-08	0.184	-	0.079	-
18-Sep-08	-	0.073	-	-
3-Jun-09	0.095	0.107	0.007	-
1-Sep-09	0.086	-	-	0.101
1-Sep-10	-	0.100	-	-
7-Jun-11	-	0.074	-	-
1-May-12	0.251	-	-	-
1-Jul-12	0.175	-	-	-
1-Aug-12	0.152	-	-	-
1-Sep-12	0.088	-	-	-
23-Jul-13	0.102	-	-	-
13-Aug-13	0.075	-	-	-
10-Oct-13	0.193	-	-	-
29-May-14	0.0939	0.0850	-	-
29-Sept-15	0.211	-	0.0038	0.202
30-Jun-16	0.144	0.389	-	-
28-Sept-16	0.159	-	-	0.124

SEDIMENT AND BENTHIC MONITORING

There was no sediment or benthic monitoring completed in 2014 to 2016, as water licence requirements for this site were only required until 2009. Sediment and benthic monitoring were last completed in 2012 as part of Golden Predator's extended baseline monitoring program at Brewery Creek.

DISCUSSION

Data from the study was assessed to determine if downstream receiving waters are being adversely affected relative to historic conditions. Results from the surface water quality program was reviewed and compared with the existing Water Use Licence parameters and CCME Guidelines to assess downstream receiving water effects. The Laura Creek AMP was not implemented; as such the site specific selenium criterion was not recalculated. Based on the results of this study, the water chemistry of lower Laura Creek is unchanged from historic conditions. The following conclusion can be summarized from this study:

- The SSWQO for selenium was not exceeded at BC-39 in the 2008 to 2016 monitoring period and was only exceeded at BC-53 for two events in 2008 and has not exceeded since then;
- Water quality at BC-39 exceeded the CCME guidelines for freshwater aquatic life for total aluminum, arsenic, chromium, copper and iron. These exceedances are consistent with existing conditions work conducted in 2007;
- Arsenic levels observed at BC-39 in 2005 and 2006 marginally exceed the CCME guideline. However, this was not the case from 2008 – 2016, and arsenic concentrations appear to have returned to historic concentrations. Elevated background levels may be related to the 2004 fire and subsequent natural reclamation near the mine site;
- Aluminum concentrations are similar to levels assessed in the 2007 existing conditions study, and lower than the historic average from 1997 to 2004;
- All results are well below the CCME cadmium guideline at BC-39.;
- Chromium concentrations only marginally exceed CCME guidelines; this is consistent with observations made in 2007;
- The calculated CCME guideline for total copper was slightly exceeded once over the period from 2008- 2016. This is consistent with observations made in 2007;
- While total iron exceeded the CCME guideline at BC-39 on a few occasions, this was also the case during pre-mine conditions. The most recent samples (since June 2008) were all below the CCME guideline; and
- Hydrological conditions in lower Laura Creek have not changed appreciably since this area was investigated, as the creek still goes to ground during low flow or winter conditions.

APPENDIX E

2016 GEOTECHNICAL INSPECTION

TETRA TECH EBA

September 20, 2016

ISSUED FOR USE
FILE: ENG.WARC03155-01
Via Email: mgm@geometals.net

GeoMetals Consulting LLC
(Golden Predator)
Suite 300 – 608 Northwest Blvd
Coeur d'Alene, ID USA 83814

Attention: Mr. Mike Maslowski – Golden Predator Agent

Subject: 2016 Geotechnical Engineering Inspection
Brewery Creek Mine Site, Yukon

1.0 INTRODUCTION

GeoMetals Consulting LLC retained Tetra Tech EBA Inc. (Tetra Tech EBA) on behalf of Golden Predator Mining Corp. (Golden Predator) to complete the 2016 Engineering Inspection of Geotechnical Infrastructure at the Brewery Creek Mine Site in Yukon. Authorization to complete this work was received by way of a signed Services Agreement dated August 17, 2016. The following structures were included in the 2016 Geotechnical Infrastructure Inspection:

- Primary Haul Road (from Golden Predator camp to Lucky Property)
- Historic Processing Facilities (ore pad, heap leach pad and containment dyke, process ponds)
- Mine Pits and Dumps (Pacific, Blue, Canadian, Moosehead, Fosters, Kokanee, Golden, and Lucky)

The locations of each structure are shown on Figure 1.

2.0 SCOPE OF SERVICES

Tetra Tech EBA's scope of services for the 2016 inspection is summarized below:

- Complete a visual inspection of the surface engineered earth structures identified above.
- Prepare a report containing the results of the inspection, summary of the stability, integrity, and status of all inspected structures, and if necessary, recommendations for remedial actions.

3.0 INSPECTION SUMMARY AND RECOMMENDATIONS

The 2016 geotechnical inspection was completed by Justin Pigage, P.Eng. on August 23rd and 24th. The following sections summarize inspection results for each structure, and provide recommendations for remedial actions if necessary. Select photographs taken during the inspection are attached to this report.

4.0 PRIMARY HAUL ROAD

The primary haul road was inspected from the current Golden Predator Camp to the Lucky Property (about seven kilometres in overall length). The primary haul road was observed to be in satisfactory condition with only minor surficial erosion (Photo 1) consistent with mining activity and maintenance having been discontinued for several years.

Tetra Tech EBA Inc.
61 Wasson Place
Whitehorse, YT Y1A 0H7 CANADA
Tel 867.668.3068 Fax 867.668.4349

Six principal drainage crossings along the haul road, locations shown on Figure 1, were noted during the inspection. Each drainage crossing consists of an armoured swale on either side of the primary haul road and a noticeable dip in the road surface to allow the passage of surface water during freshet and significant precipitation events (Photo 2). The armouring and road surface at all six drainage crossing locations was observed to be in good condition (Photo 3).

A single 600 mm diameter corrugated steel pipe culvert exists at the end of the maintained haul road (Bohemian Access Trail). At the time of the inspection the culvert was unobstructed and no erosion was noted (Photo 4)

Consistent with previous observations no visual signs of instability (vegetation disturbance, sloughing, or tension cracking) were observed on the primary haul road associated with a failure noted and repaired in 2003 near the Lucky Pit (Photo 5).

Several small vertical failures crossing the road surface near the Pacific Pit were noted during the 2014 Engineering Inspection and maintenance was recommended to prevent additional erosion. Through discussions with Golden Predator, Tetra Tech EBA determined repair work was completed in response to the above recommendation shortly after the 2014 Engineering Inspection. The primary haul road surface appeared stable and intact in the location in question at the time of the inspection (Photo 6).

No remedial action is required for the primary haul road at this time. The road is suitable for use as a light traffic access road in its current condition. A stability assessment should be completed by a Geotechnical Engineer prior to the road being recommissioned for heavy haul traffic if mining operations resume on the site.

5.0 HISTORIC PROCESSING FACILITIES

5.1 Ore and Heap Leach Pads

The ore and heap leach pads have been recontoured and reclaimed with a vegetation cover that is well established (Photo 7). No visual signs of instability were noted during the inspection.

5.2 Containment Dyke

The heap leach containment dyke appeared intact at the time of the inspection with no visual signs of instability (Photo 8). The armoured breach channel, intended to prevent surface water accumulation behind the containment dyke, located above the process ponds was intact at the time of inspection (Photo 9). A trickle of surface water within the coarse armouring of the breach channel was heard at the time of the inspection.

5.3 Process Ponds

The three decommissioned process ponds appeared intact at the time of the inspection with no signs of erosion or overtopping (Photo 10 and Photo 11). The overflow structures linking the process ponds and the emergency overflow spillways were intact and unobstructed at the time of the inspection (Photo 12). The decommissioned process ponds appeared to be functioning as intended.

No remedial action is required for the historic processing facilities at this time.

6.0 MINE PITS AND DUMPS

The following mine pits and waste rock dumps, including overflow structures, erosion protection measures, and toe berms were observed as part of the inspection:

- Pacific
- Blue
- Canadian
- Moosehead
- Fosters
- Kokanee
- Golden
- Lucky

In general, vegetation is well established on all of the above listed structures and no stability concerns were observed during the inspection (Photo 13). The pit walls and waste rock dumps appeared stable (Photo 14). The pit ponds and associated overflow structures appeared intact and functioning at the time of the inspection (Photo 15). As vegetation continues to establish on these structures, access will be increasingly difficult and inspection exclusively from the primary haul road should be considered to promote the full recovery of vegetative cover and access road abandonment.

No remedial action is required for the mine pits and dumps.

7.0 CONCLUSIONS AND RECOMMENDATIONS

From a geotechnical stability perspective, the surface engineered earth structures included in the 2016 inspection pose no significant risk to the environment or human health and safety in their current condition.

Inspection of the surface engineered earth structures by a Geotechnical Engineer should continue every two years or in response to stability concerns reported by site personnel during routine site activities.

8.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Golden Predator Mining Corp. and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Golden Predator Mining Corp., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

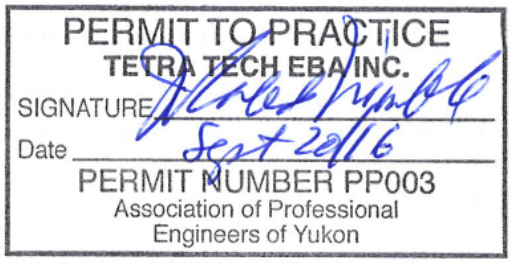
9.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

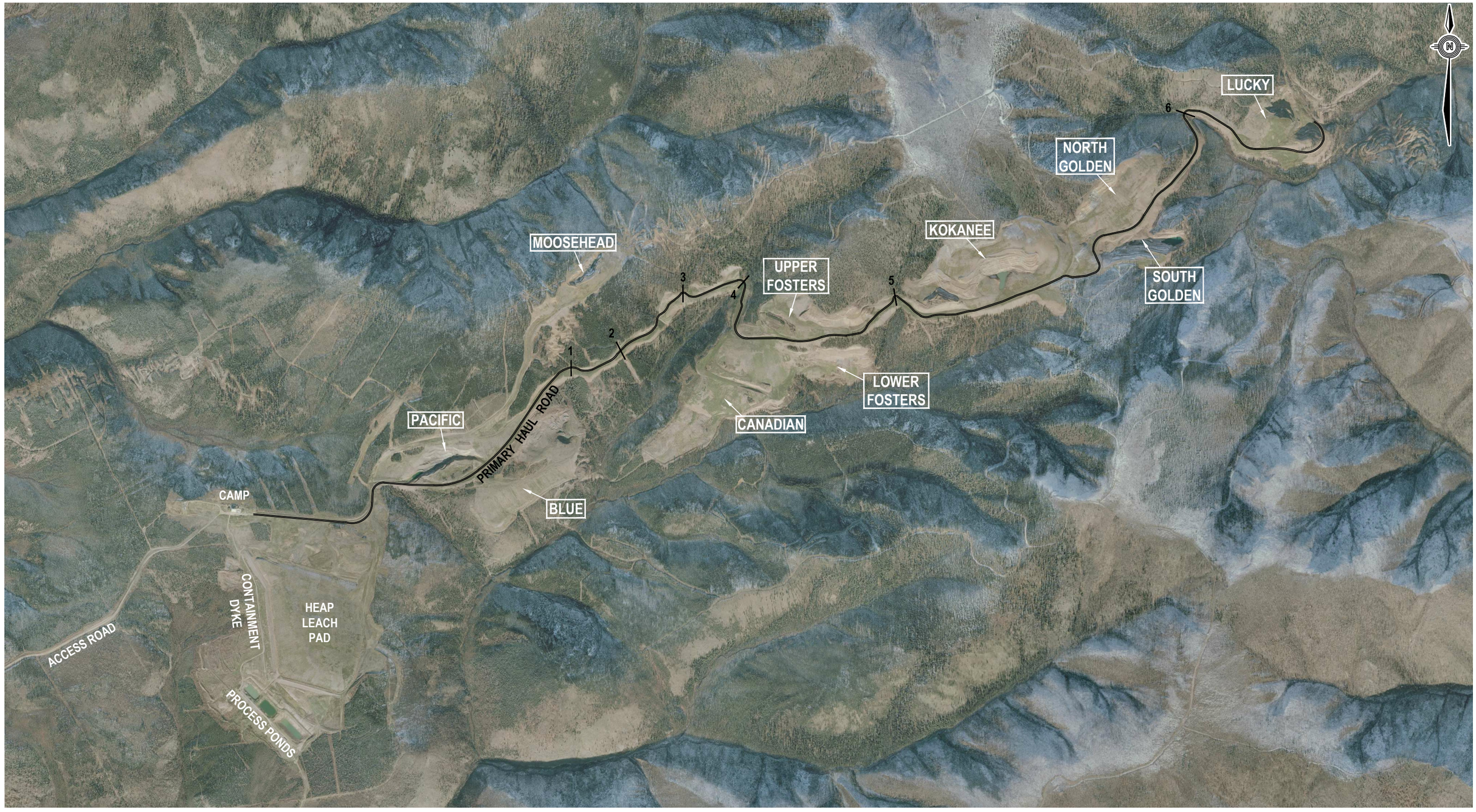
Respectfully submitted,
Tetra Tech EBA Inc.

Prepared by:
Justin Pigage, P.Eng.
Geotechnical Engineer, Arctic Region
Direct Line: 867.668.9213
Justin.Pigage@tetratech.com

Reviewed by:
J. Richard Trimble, P.Eng., FEC
Principal Consultant, Arctic Region
Direct Line: 867.668.9216
Richard.Trimble@tetratech.com



FIGURES



LEGEND

\# - DRAINAGE CROSSING LOCATION

0 1,000m

Scale: 1:20,000 @ 11"x17"

CLIENT

GOLDEN PREDATOR TSX: GPD

TETRA TECH EBA

2016 GEOTECHNICAL INFRASTRUCTURE INSPECTION BREWERY CREEK, YUKON

SITE PLAN

PROJECT NO.	DWN	CKD	REV
ENG.WARC03155-01	CB	JTP	0

OFFICE: EBA-WHSE

DATE: September 16, 2016

Figure 1

PHOTOGRAPHS

Photo 1: **Primary Haul Road**
Surficial erosion near Golden pits
Facing west — August 23, 2016

Photo 2: **Primary Haul Road**
Drainage Crossing #3
Facing northwest — August 23, 2016

Photo 3: **Primary Haul Road**
Armouring downslope of drainage crossing #2
Facing south — August 23, 2016

Photo 4: **Primary Haul Road**
Culvert outlet at Bohemian Trail crossing
Facing east — August 23, 2016

Photo 5: **Primary Haul Road**
Historic instability near Lucky Pit
Facing northeast — August 23, 2016

Photo 6: **Primary Haul Road**
Repaired road surface near Pacific Pit
Facing east — August 23, 2016

Photo 7: **Heap Leach Pad**
Vegetation established on heap leach pad
Facing east — August 23, 2016

Photo 8: **Containment Dyke**
Stable heap leach containment dyke
Facing east — August 23, 2016

Photo 9: **Containment Dyke**
Armoured breach channel above process ponds
Facing southwest — August 23, 2016

Photo 10: **Process Ponds**
Decommissioned Process Ponds
Facing west — August 23, 2016

Photo 11: **Process Ponds**
Decommissioned Pregnant Process Pond
Facing north — August 23, 2016

Photo 12: **Process Ponds**
Pregnant Pond armoured emergency spillway
Facing south — August 23, 2016

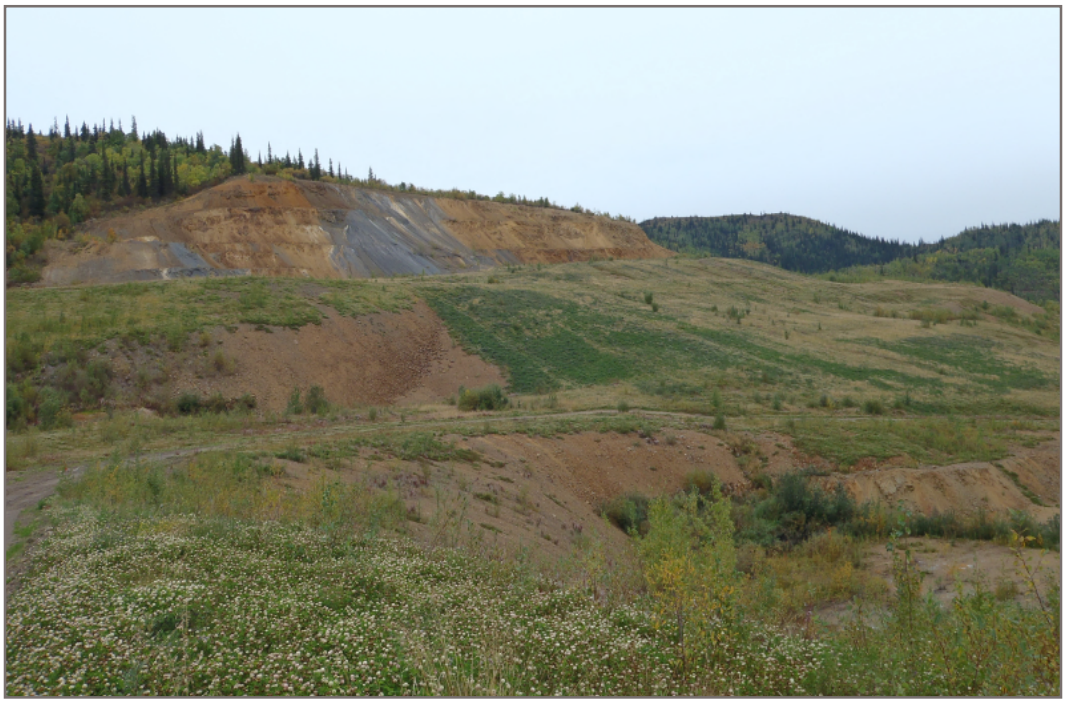


Photo 13: **North Golden**
Vegetation established on structures
Facing north — August 23, 2016

Photo 14: **Kokanee**
Stable pit walls and waste rock dumps
Facing east — August 23, 2016

Photo 15: **Moosehead**
Intact pit overflow structure
Facing northeast — August 23, 2016

APPENDIX A
TETRA TECH EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of Tetra Tech EBA’s Client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA’s Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Tetra Tech EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA’s instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. Tetra Tech EBA’s instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, Tetra Tech EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. Tetra Tech EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. Tetra Tech EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

7.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

8.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

9.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

10.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

11.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

12.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

13.0 SAMPLES

Tetra Tech EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

14.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.