# Environmental Surveillance Plan
# for
# Vic Project

# 2012

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## 1.0 Introduction

Aurchem Exploration holds a Type B Water Use Licence QZ06-073, scheduled to expire December 31, 2012. We are currently applying to renew this licence. The environmental sampling programs required under WUL QZ06-073 are summarized in Section 2.0. In addition to that required sampling, Aurchem will conduct various physical inspections and monitoring of mine site facilities, waste rock dump and open trenches to ensure there are no failures, leaks or maintenance concerns and that the mine operations are working as effectively and efficiently as possible. Details of those monitoring programs are included in this report.

The Aurchem Pilot Mill project is a small mining project, operating at 50t/day production. The company itself is a small family owned/operated business. The mine foot print is very small as the company plans to mine only one mining area, in fact, one trench, on its Aurchem property near Mt. Nansen and across from the Victoria Mountain area (See Figure 1 Location Map below). The milling operation is small as well. It is a portable mill, able to fit on a flat deck truck (see photo below). The operation is seasonal, May-late August, and requires minimal amounts of water (300m3/day). Discharge from the mill into the tailings ponds is also minimal, and will happen once per operating season into tailings pools. As per our current Type B WUL QZ06-073, we have several water quality sampling stations on site to ensure that we meet discharge criteria set out in our WUL. A copy of the WUL QZ06-073 is attached.

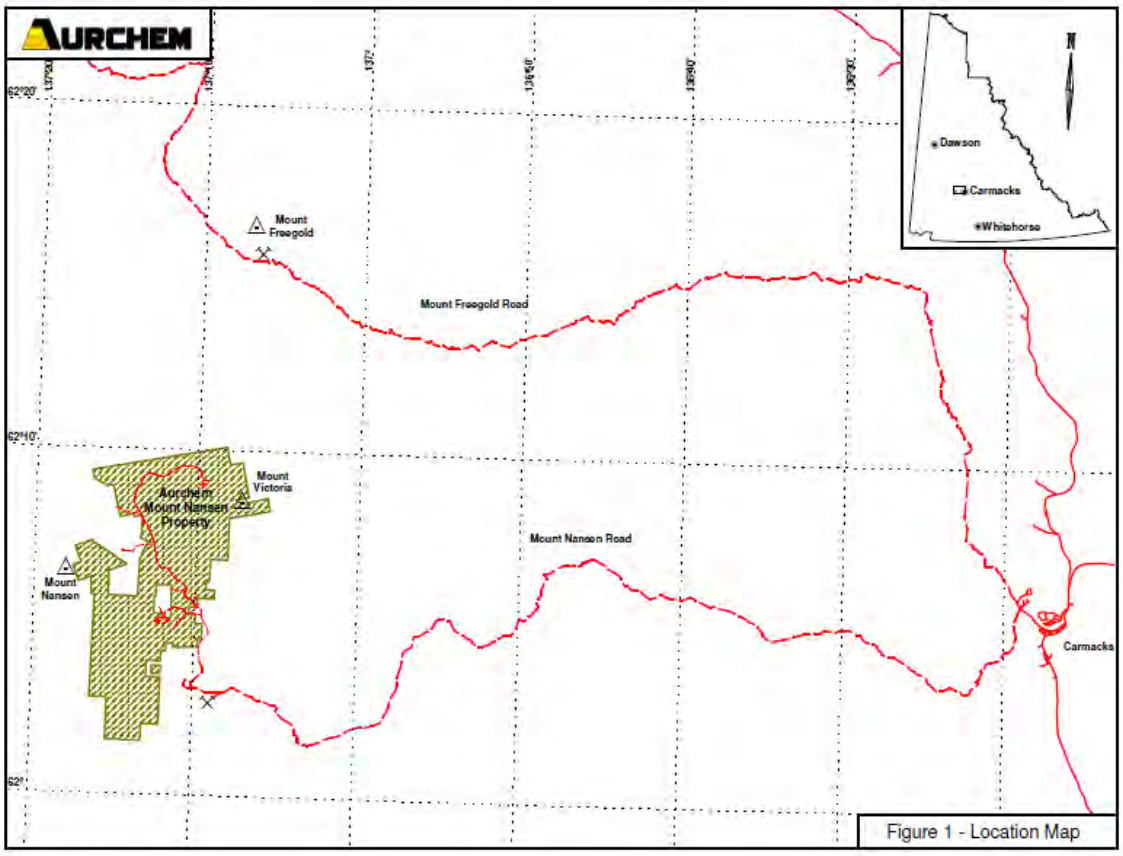



Photo 1 Portable Mill

# 2.0 Type B WUL QZ06-073 Sampling Requirements

## 2.1 Effluent

The points of compliance for effluent quality standards required by condition 32 of this licence shall be:
a) discharge in the form of seepage from the rock storage areas, and
b) from the final settling pools, prior to seasonal discharge to the existing trenches.

No waste discharge shall exceed the following limits:

| Parameter | Maximum Concentration (measured in mg/L) |
|---|---|
| Arsenic (total) | 0.50 mg/L |
| Cadmium (total) | 0.02 mg/L |
| Copper (total) | 0.30 mg/L |
| Lead (total) | 0.20 mg/L |
| Nickel (total) | 0.50 mg/L |
| Ammonia (as total N) | 2.50 mg/L |
| Zinc (total) | 0.50 mg/L |
| Selenium (total) | 0.015 mg/L |
| Total Suspended Solids (TSS) | 15.0 mg/L |

A summary of the environmental monitoring and surveillance programs for the undertaking are as follows:

## 2.2 Rock Monitoring and Testing Plan

No less than 30 days prior to commencement of excavation of an open-pit for the purpose of quartz mining, the Licensee shall submit to the Board, a detailed rock monitoring and testing plan describing the procedures to be used for sampling and testing the geochemical characteristics of rocks encountered during excavation. The plan shall include, but not necessarily be limited to:

a) plans for the sampling of each rock type encountered including size and number of samples,
b) plans for assessing the physical characteristics of each rock type including petrographic and hand specimen descriptions, mineralogical analysis, freeze thaw stability, and grain size characterization,
c) plans for geochemical characterization of each rock type including whole rock and trace element chemistry,
d) protocol for shake flask testing of each rock type,
e) plans for assessing acid rock drainage or metal leaching characteristics of the rock types including static and kinetic test protocols and duration and plans for analysis of the test data,
f) details of any decision making protocol involving segregation of rock materials in the storage area.
g) mitigation methods in the event that acid rock drainage is detected in any discharge.

Upon commencement of excavation, the Licensee shall implement the rock monitoring and testing plan. In the event that the plan requires revision, the Licensee shall submit a revised plan to the Board no less than 10 days after the revision including an explanation of why the revisions are necessary.

## 2.3 Permanent Closure Plan

Within one year of the commencement of operations, the Licensee shall submit a draft plan for permanent closure of the undertaking to the Board. The plan shall be for the reclamation and decommissioning of the appurtenant undertaking and is to include specific measures to be undertaken for the stabilization and restoration of the site including, but is not necessarily limited to:

a) an updated water quality model and an assessment of impact of the closed site,
b) a contingency plan in the event that the wastewater in the final tailings pools or the waste rock storage seepage requires year round water treatment,
c) the physical and chemical stability of all components of the works during permanent closure,
d) a feasibility study for returning all potentially acid generating rock into the environment, including associated cost estimates,
e) cost estimates for permanent closure based on completion by third party contractors,
f) final configuration of the rock storage area, if required and a plan for the return of waste rock to the open-pit,
g) settling pond stability, including any contained tailings, if required,
h) seepage and runoff collection system,
i) provisions for ongoing water collection and treatment to maintain discharge standards,
j) monitoring of discharge, receiving environment and all physical structures remaining on site,
k) maintenance of pools, waste rock storage areas, covers, if necessary,
l) a schedule for completion of the closure measures, including on going monitoring,
m) any reclamation or recontouring of the ground surface, and
n) provisions for temporary closure.

One year prior to the expiry date of this licence, the Licensee shall submit a final plan for permanent closure of the undertaking that includes at a minimum, the information required by this licence for the draft closure plan and a discussion of the updates that have been incorporated into the final plan.

**Aurchem has submitted both the Temporary and Permanent Closure Plans to the Yukon Water Board and EMR for review.**

## 2.4 Schedule of Water Quality Monitoring on Site as per Water Use Licence QZ06-073

As per the Type B WUL QZ06-073, the following sites are to be sampled when in operation:

Station 1: unnamed creek, known locally as Iron Creek, UTM Coordinates 383997E, 6892726N
Station 2: unnamed creek, known locally as Iron Creek, UTM Coordinates 386536E, 6893585N

Station 3: Klaza Creek, UTM Coordinates 384168E, 6890576N
Station 4: Clarifier pond
Station 5: Process ponds
Station 6: Mine Pits and Active Sumps
Station 7: Any discharge from tailings storage
Station 8: Any discharge from waste rock storage
Station 9: Any discharge from mine excavations

The sampling frequency and sampling parameters are included in Table 1.

**Table 1. Sampling frequency and water quality parameters QZ06-073**

| SURVEILLANCE NETWORK PROGRAM STATION NO. | ANALYTICAL SUITE / FREQUENCY |
|---|---|
| 1 | $IS/M_1$, WC/Q |
| 2 | $IS/M_1$, WC/Q |
| 3 | $IS/M_1$, WC/Q |
| 4 | $IS/M_1$, $LV/M_1$, WC/Q |
| 5 | $IS/M_1$, $LV/M_1$, WC/Q |
| 6 | $IS/M_1$, $LV/M_1$, WC/Q |
| 7 | $F/M_2$, $IS/M_2$, $WC/M_2$ |
| 8 | $F/M_2$, $IS/M_2$, $WC/M_2$ |
| 9 | $F/M_2$, $IS/M_2$, $WC/M_2$ |

Legend:

**IS:** In-situ Measurements (Flow, Field pH, Field Temperature, Field Conductivity.
**WC:** Water Chemistry (ICP Total Metals by Low Method Detection Limits, ICP Dissolved Metals by Low Method Detection Limits, Hardness, Total Suspended Solids, Total Dissolved Solids, Total Alkalinity, Total Sulphate, Nitrogen-Nitrate, Nitrogen-Nitrite.
**LV:** Water level and volume.
**F:** Flow rate.
**$M_1$**: Monthly when operating.
**$M_2$**: Monthly when discharging, with the first sample taken within the first week of the beginning of discharge.
**Q:** Quarterly when operating, with the first sample taken during the first month of seasonal operation.

The Map, Aurchem Water Quality Sampling Stations, included in Appendix A shows locations of sampling stations.

Grab samples are collected as per the Licence requirements. Samples are sent to an outside lab for analysis. Flow measurements are collected using a Hanna Flowmate.

When the mill is in operation, and when water is slated to be discharged into the tailings pools, Aurchem proposes to collect weekly from the discharge water entering the tailings pools.

Samples will be analyzed for total and dissolved metals and TSS to ensure compliance with the Water Use Licence conditions.

Aurchem collected baseline water quality samples in July 2012 from three of the sample locations identified in the WUL, Locations 1, 2 and 3. We also sampled 300 m down gradient from our overburden dump. We will continue with this monthly baseline sampling as per our July sampling event, and will resume sampling May 2013.

During operations, care will be taken to avoid disturbing the riparian zone on Iron Creek. Pumps will be placed on spill pans to prevent any potential leaks from the pump entering the water course. No fuel will be stored at the pump site for refueling purposes. Pump will be screened to prevent fish passage.

## 2.5 Baseline sampling

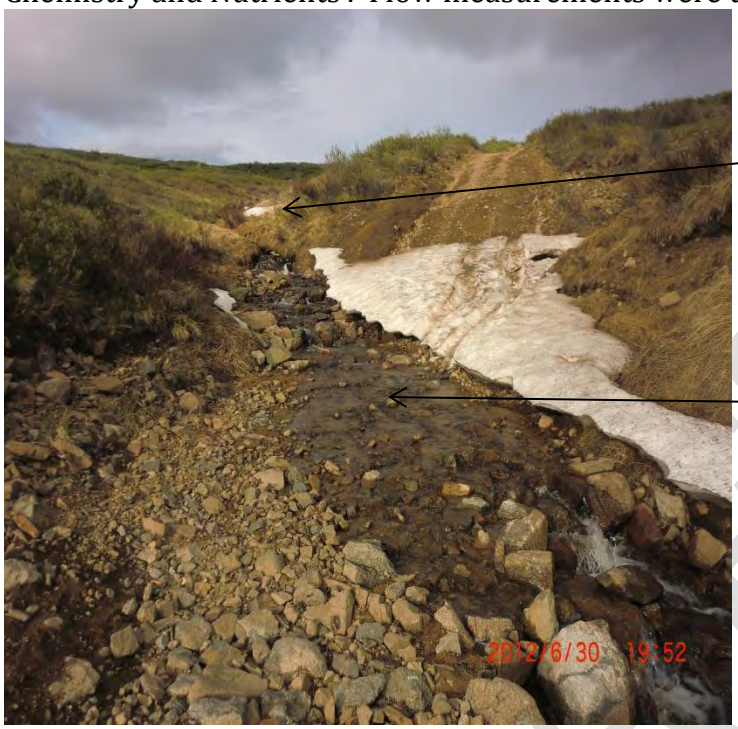
Aurchem complete a baseline water quality and hydrology sampling event in July 2012. Below is a summary of the sampling event:

1. **Sampling Site: Iron Creek up 08 0386414 6893774**


Iron Creek Up is downstream of the project. It is located at the creek crossing approximately 2 km downstream of the site.

| |
|---|
| Temp- 3.7 C |
| TDS- 9 ppm |
| pH- 7.78 |
| Conductivity – 8 uS |
| Flow rate- 0.02 m3/s or 20L/s |

Water Quality samples were collected and were analyzed for Total Metals, Dissolved Metals, WAD Cyanide, Total Suspended Solids, Total Organic Carbon, and General Chemistry and Nutrients . Flow measurements were taken as well.




2. **Iron Creek (a)- this sampling site is located on Iron Creek approximately 300 m downstream of the Overburden Dump. 08 0387332 6893205**

Water Quality samples were collected and were analyzed for Total Metals, Dissolved Metals, WAD Cyanide, Total Suspended Solids, Total Organic Carbon, and General Chemistry and Nutrients . Flow measurements were not taken at this site.

| |
|---|
| Temp- 4.3 C |
| TDS- 13 ppm |
| pH- 7.3 |
| Conductivity – 27 uS |

3. **Iron Creek (b)**- 08 0383927 6892983

This sampling station is approximately 2 km downstream of Iron Creek Up. Wetted banks for this station were at 1.4 m and .14m, making the channel approximately

1.5 metres wide. Creek is very shallow and was difficult to get a cross sectional area of the creek due to the amount of rocks and boulders.

| |
|---|
| Temp- 9.0 C |
| TDS- 3 ppm |
| pH- 7.34 |
| Conductivity – 7 uS |
| Flow- .01 m3/s or 10L/s |

Water Quality samples were collected and were analyzed for Total Metals, Dissolved Metals, WAD Cyanide, Total Suspended Solids, Total Organic Carbon, and General Chemistry and Nutrients . Flow measurements were taken as well.

4. **Klaza- 08 0384095 6890725**


| |
|---|
| Temp- 5.4 C |
| TDS- 20 ppm |
| pH- 7.69 |
| Conductivity – 34 uS |
| Flow- .26m3/s or 260 l/s |

Klaza is located near previous camp site area.
Water Quality samples were collected and analyzed for Total Metals, Dissolved Metals, WAD Cyanide, Total Suspended Solids, Total Organic Carbon, and General Chemistry and Nutrients . Flow measurements were taken as well.

Aurchem plans to continue collecting these samples and flow measurements on a monthly basis from May-October. Year round sampling is not possible due to the inability to access the site during winter conditions.

July flow measurements indicate that both Iron Creek and Klaza Creek are relatively low yielding water bodies. Iron Creek is ephemeral, and later in the summer will run dry, it is fed by snowmelt from the upper elevations surrounding it. Water Quality Results are attached in Appendix B.

## 3.0 Physical Monitoring Program:

Aurchem will conduct inspections of its Waste Rock Dump facility and Tailings Ponds, to ensure each are operating effectively. Below is a summary of our inspection programs to be carried out on site.

### 3.1 Tailings Facility Program

Aurchem will be using 3-5above ground swimming pools to store tailings from its milling process. Each pool has a capacity of approximately 8200 US gal. Tailings will be deposited into these pools. There is enough capacity in these pools to contain tailings for one season of milling. Once the operating season ends, tailings will be tested chemically for disposal back into the open trenches on site, should results indicate they are benign. Tailings will only be disposed of at the end of the operating season. Should water from our tailings ponds not meet discharge standards (after it has settled), tailings water will be sent back through the floatation circuit in an attempt to float any residual heavy metals and solids out of the water. The concentrate will then be collected, sampled and sent to an outside lab for analysis to ensure it meets CSR standards. It will either be disposed of in the trenches on site or, if it does not meet CSR standards, will be hauled off site to a certified contaminated waste disposal facility.

The on-site manager will conduct daily inspections of the mill and all its workings. Settling ponds will be inspected for damage and leaks on a daily basis. The mill will be inspected daily for operational failures, equipment failures and overall O and M integrity. Any operational or equipment issues will be rectified once found in order to prevent operational down time and to ensure effective and efficient working conditions.

### 3.2 Waste Rock and Overburden Monitoring:

**ARD sampling to date has indicated little to no ARD potential.** This pilot project is designed to test a shallow high grade ore body and is not planning to excavate more than 20m depth. Historically, no deep samples were tested as they fall out of

this projects scope. In 2005, ARD samples were sent to the lab for ABA and ARD multi-element analysis. The samples were taken from RC drilling and represent ore, the waste rock interval directly above the ore, and sometimes surface waste rock. The samples were taken in key areas in and above ore. Please see attached detailed sampling map (Appendix A- Aurchem Pilot Mill Project) for exact locations.

Results of the ABA and multi-element analysis are located in Appendix C. Sample locations were as follows:

RC0506-20 (20 feet- waste sample)
RC0506-35 (35 feet-waste sample)

RC0510-10 (10 feet- waste sample)
RC0510-45 (45 feet-ore sample)

RC0519-10 (10 feet-waste sample)
RC0519-20 (20 feet- ore sample)
RC0519-25 (25 feet- ore sample)

RC0520-110 (110 feet- ore sample)
RC0520-115 (115 feet- ore sample)

RC0523-70 (70 feet- waste sample)
RC0523-80 (80 feet- ore sample)

Currently no ARD risk is shown. Our test results were sent to a third part for review. Scott Davidson, M.Sc., P.Geo. (BC), P.Geol. (NT/NU) , Senior Project Manager at Access Consulting reviewed the results and stated in an email, dated November 30th, 2012,

> "*As per our earlier discussion I am currently finalizing the letter on the sample results you provided to me to review. It is my understanding that the samples were collected using rotary core drilling with one sample being collected from the ore zone and one sample being collected from the waste rock just above the ore zone. The samples are all of low sulphur content (all less than 0.02%) with little acid generation potential (maximum of 0.6 kgCaCO3/t) . The neutralization potential of the rocks is also low (ranging from 3 to 11 kg CaCO3/t), however, there is sufficient neutralization potential within the analyzed samples that they are all classified as non-acid generating with neutralization potential ratios ranging from 4.8 to 70.4.*" (email dated November 30, 2012, Scott Davidson). A copy of this email is included in Appendix D.

Additional ARD and ABA testing will occur prior to the commencement of mining activities on site. ARD and ABA samples will be collected from the area of interest, located on the Map included in Appendix A. This area of interest includes our

Maverick vein. We will pull 10 samples from this vein, at three depth intervals, in order to include a waste rock and 2 ore samples. Sample location will be 10 meters apart on centre. Samples will be sent to Maxxam analytical for analysis (ABA and ARD). Samples will be analyzed for ABA and metal leaching. We will send ½ kilo sample bags to Maxxam so that they can perform the ABA testing and metal leaching analysis. If we encounter any rock that has the potential to create ARD, we will set-up kinetic tests on site on that rock. We will follow the Kinetic testing protocol outlined in the MEND Program and the British Columbia ARD Task Force.

## 3.3 Data Evaluation and Monitoring

Surface water quality testing will be carried out according to the schedule included in our Type B WUL, and included in Table 1. When operating, water quality samples from the tailings ponds are taken monthly. When discharging directly from the mill, we propose to collect weekly samples from that discharge. Samples of the tails will be collected and tested at the end of the operating season. Samples from discharge from the tailings ponds are taken monthly as well, with the first sample taken within one week of discharge. All physical monitoring, including the Waste Rock Dump, ABA results, condition of Mill and Tailings Pools, and all water quality monitoring results will be summarized in a monthly report to be submitted to the Yukon Water Board and Energy Mines and Resources. Results from the weekly sampling of the Mill discharge will be submitted as soon as lab results are ready.

## 3.4 Progressive Reclamation Effectiveness Monitoring Program

Aurchem has begun progressive reclamation at its site, and an update with pictures has been provided to EMR and the Yukon Water Board. We have backfilled a few of our open trenches, and re-contoured them to allow for vegetative growth. We will continue monitoring the natural re-vegetative success of our reclamation efforts, and continue to backfill unused open trenches as we progress with our project. Pictures and a narrative of all reclamation efforts will be provided to the Yukon Water Board and EMR once an area has been reclaimed.

### 3.4.1 Progressive Reclamation Efforts

Many of the open trenches that are no longer part of our exploration program have been reclaimed. Below are two pictures that show two of the trenches that have been back-filled and re-contoured. These are just examples of the work that has been done on site. All trenches that are no longer in use have been backfilled. Open trenches have remained so as they are part of our on going exploration work and pre-production activities as we move towards production.

Reclaimed trench

### 3.5 Other Monitoring Programs

As stated earlier, Aurchem has monitoring requirements for its operations that are included in it Type B Water Use Licence, QZ06-073. Those requirements have been summarized in section 2.0 of this report.

## 4.0 Summary

Table 2, below, summarizes the environmental surveillance plan for the Aurchem project. Some of the plan is prescribed by the Water Use Licence QZ06-073 and some has been developed by Aurchem as additional sampling and monitoring for the site.

**Table 2. Summary of Environmental Monitoring**

| SURVEILLANCE NETWORK PROGRAM STATION NO. | ANALYTICAL SUITE / FREQUENCY |
|---|---|
| Station 1: unnamed creek, known locally as Iron Creek, UTM Coordinates 383997E, 6892726N | $IS/M_1$, WC/Q |
| Station 2: unnamed creek, known locally as Iron Creek, UTM Coordinates 386536E, 6893585N | $IS/M_1$, WC/Q |
| Station 3: Klaza Creek, UTM Coordinates 384168E, 6890576N | $IS/M_1$, WC/Q |
| Station 4: Clarifier pond | $IS/M_1$, $LV/M_1$, WC/Q |
| Station 5: Process ponds | $IS/M_1$, $LV/M_1$, WC/Q |
| Station 6: Mine Pits and Active Sumps | $IS/M_1$, $LV/M_1$, WC/Q |
| Station 7: Any discharge from tailings storage | $F/M_2$, $IS/M_2$, $WC/M_2$ |

| | |
|---|---|
| Station 8: Any discharge from waste rock storage | $F/M_2$, $IS/M_2$, $WC/M_2$ |
| Station 9: Any discharge from mine excavations | $F/M_2$, $IS/M_2$, $WC/M_2$ |
| **Physical Monitoring and other Sampling** | **ANALYTICAL SUITE / FREQUENCY** |
| Waste Rock Dump | Weekly Physical Inspection for Stability |
| Acid Base Accounting | No less than 30 days prior to commencement of excavation of an open-pit as per Type B WUL and section 3.2 of this plan |
| Tailing Pools | Weekly Inspection for Stability, leaks, malfunctions |
| Mill | Daily Inspections for malfunctions and leaks; weekly samples when discharging to tailing pools and analyze for IS and WC |

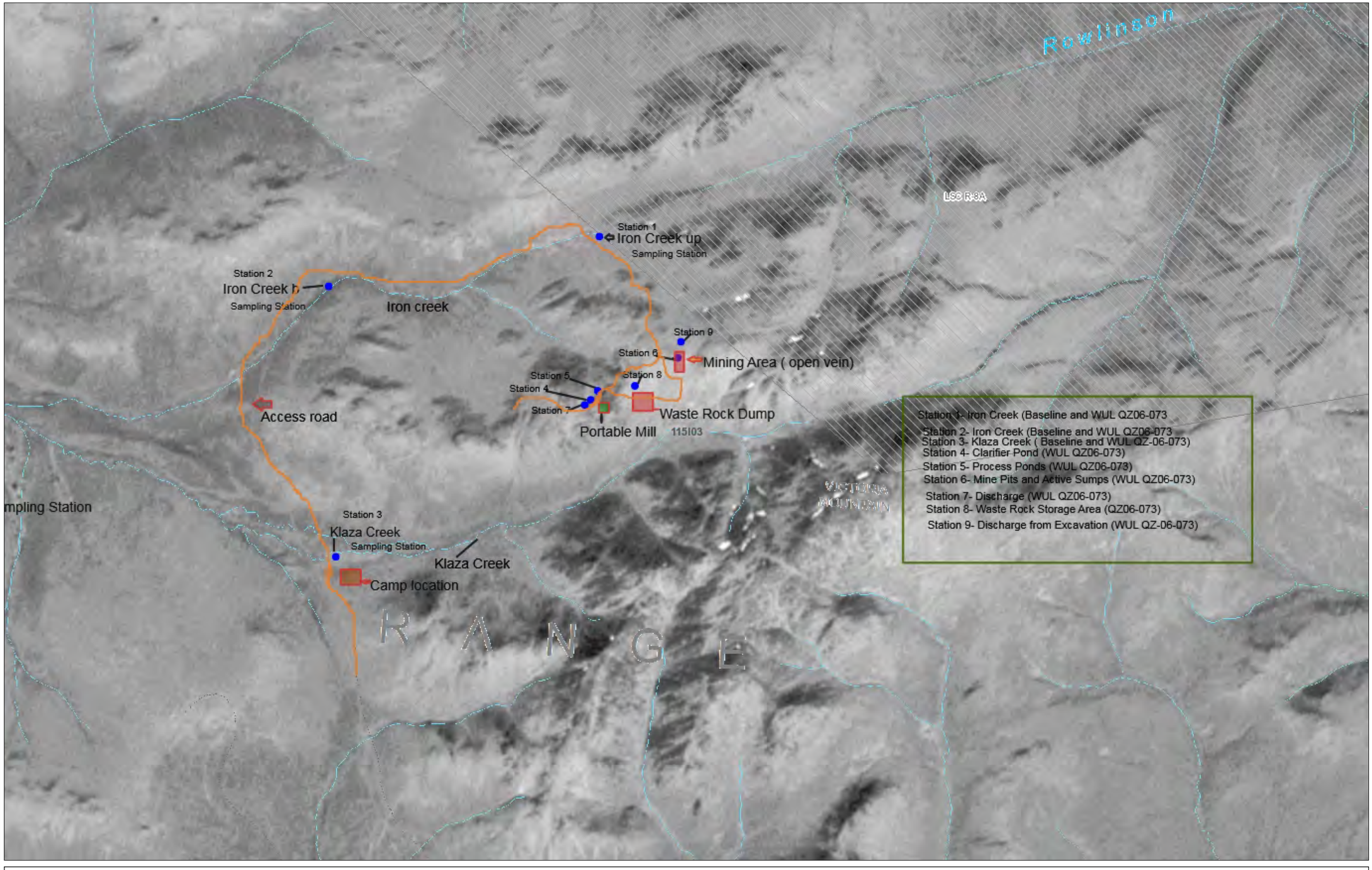
**IS:** In-situ Measurements (Flow, Field pH, Field Temperature, Field Conductivity.
**WC:** Water Chemistry (ICP Total Metals by Low Method Detection Limits, ICP Dissolved Metals by Low Method Detection Limits, Hardness, Total Suspended Solids, Total Dissolved Solids, Total Alkalinity, Total Sulphate, Nitrogen-Nitrate, Nitrogen-Nitrite.
**LV:** Water level and volume.
**F:** Flow rate.
**$M_1$**: Monthly when operating.
**$M_2$**: Monthly when discharging, with the first sample taken within the first week of the beginning of discharge.
**Q:** Quarterly when operating, with the first sample taken during the first month of seasonal operation.

# Appendix A

Map of Water Quality Sampling Stations and ABA sample locations 2005

Yukon
Energy, Mines and Resources

# Aurchem Water Quality Sampling Stations




## Legend

- Surveyed Land Parcels
- Surveyed Easements
- Municipalities and Subdivisions
  - MUNICIPAL BOUNDARY
  - SPATIAL EXTENT
  - SUBDIVISION
- 1:10,000 Mapsheet Index
- 1:50,000 NTS Mapsheet Index
- Settlement Lands (Surveyed)
  - A: Surface and Subsurface Rights
  - B: Surface Rights
  - FS: Fee Simple
- Settlement Lands (Unsurveyed
  - A
  - B
  - FS
- Interim Protected Lands (Unsu
- Areas withdrawn from staking
  - No
  - Yes
- Orthophotos - Whitehorse - 20
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- Orthophotos - Abandoned Min
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- Orthophotos - YG - Transporta
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- WorldView1
  - High : 254
  - Low : 2
- WorldView2
  - Red: Band 1

## Notes

1.7 0 0.87 1.7 Kilometers

Yukon Albers
Produced from: Yukon Mining Viewer

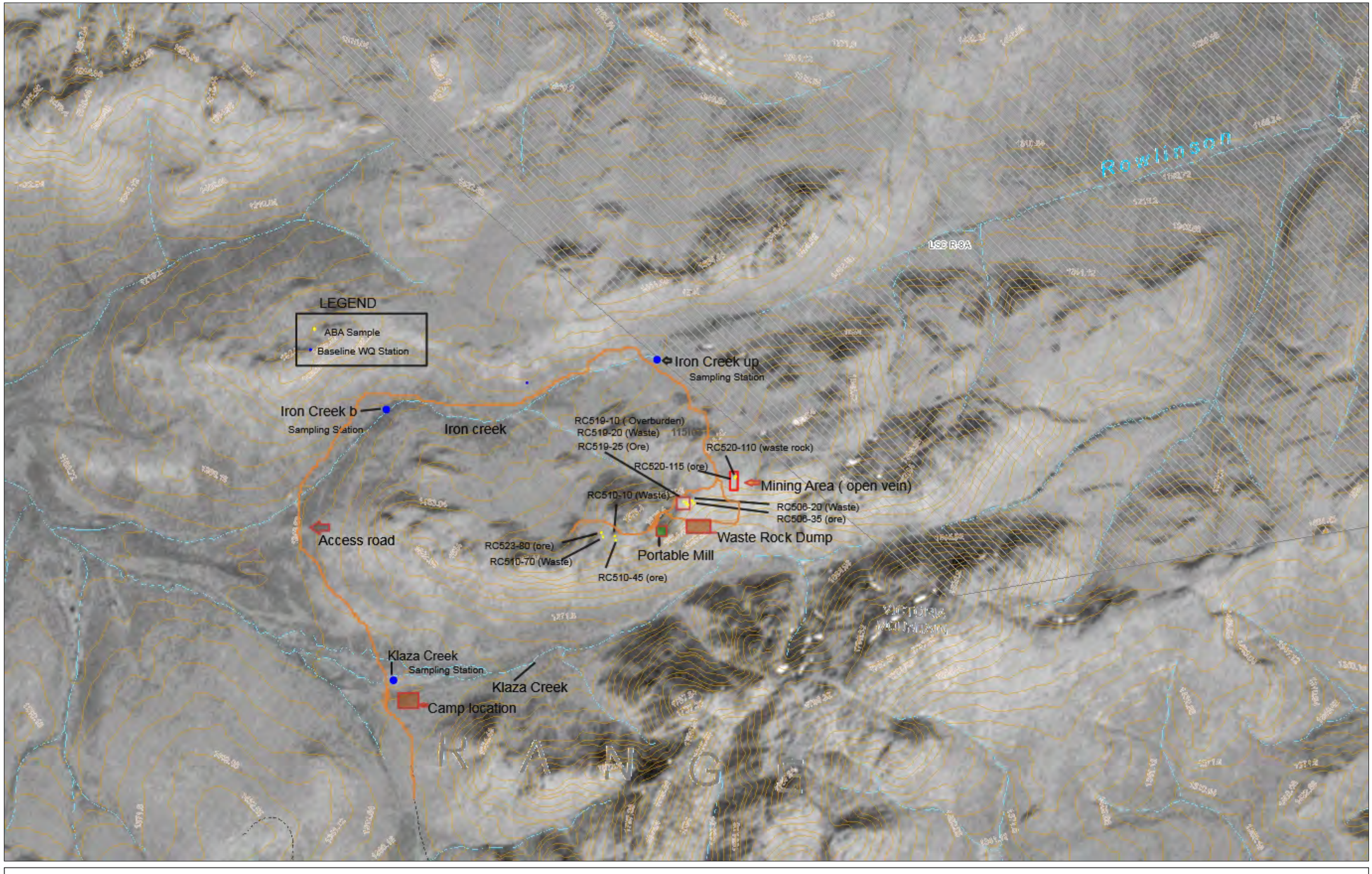
Scale: 1: 34,245



Date Printed: 25-Nov-2012

Yukon
Energy, Mines and Resources

# Aurchem Pilot Mill Project




## Legend

- Surveyed Land Parcels
- Surveyed Easements
- Municipalities and Subdivisions
  - MUNICIPAL BOUNDARY
  - SPATIAL EXTENT
  - SUBDIVISION
- 1:10,000 Mapsheet Index
- 1:50,000 NTS Mapsheet Index
- Settlement Lands (Surveyed)
  - A: Surface and Subsurface Rights
  - B: Surface Rights
  - FS: Fee Simple
- Settlement Lands (Unsurveyed
  - A
  - B
  - FS
- Interim Protected Lands (Unsu
- Areas withdrawn from staking
  - No
  - Yes
- Highway Kilometre Posts
- Gravel Pits
- NTS Trails and Cutlines (50K)
  - Cutline
  - Limited-use road
  - Trail
- Spot Height (50K)
- Contours (50K)
- Orthophotos - Whitehorse - 20
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- Orthophotos - Abandoned Min
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- Orthophotos - YG - Transporta
  - Red: Band 1

## Notes

1.7 0 0.87 1.7 Kilometers

Yukon Albers
Produced from: Yukon Mining Viewer

Scale: 1: 34,245



Date Printed: 23-Nov-2012

# Appendix B

Water Quality Results from July Baseline Sampling Event

Maxxam

Success Through Science®

Your C.O.C. #: 28013401

**Attention: Jillian Chown**
AURCHEM EXPLORATIONS LTD.
15 LOGANBERRY LANE
WHITEHORSE, YT
CANADA Y1A5W4

**Report Date: 2012/08/21**
This report supersedes all previous reports with the same Maxxam job number

# CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B257183**
**Received: 2012/07/04, 11:00**

Sample Matrix: Water
# Samples Received: 4

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| Alkalinity - Water | 3 | 2012/07/05 | 2012/07/05 | BBY6SOP-00026 | SM2320B |
| Alkalinity - Water | 1 | 2012/07/06 | 2012/07/06 | BBY6SOP-00026 | SM2320B |
| Chloride by Automated Colourimetry | 3 | N/A | 2012/07/05 | BBY6SOP-00011 | SM-4500-Cl- |
| Chloride by Automated Colourimetry | 1 | N/A | 2012/07/06 | BBY6SOP-00011 | SM-4500-Cl- |
| Cyanide WAD (weak acid dissociable) | 4 | N/A | 2012/07/10 | BBY6SOP-00005 | SM-4500CN I |
| Conductance - water | 3 | N/A | 2012/07/05 | BBY6SOP-00026 | SM-2510B |
| Conductance - water | 1 | N/A | 2012/07/06 | BBY6SOP-00026 | SM-2510B |
| Fluoride - Mining Clients | 4 | N/A | 2012/07/06 | BBY6SOP-00038 | SM - 4500 F C |
| Hardness Total (calculated as CaCO3) | 4 | N/A | 2012/07/10 | BBY WI-00033 | Calculated Parameter |
| Hardness (calculated as CaCO3) | 4 | N/A | 2012/07/10 | BBY WI-00033 | Calculated Parameter |
| Na, K, Ca, Mg, S by CRC ICPMS (diss.) | 4 | N/A | 2012/07/10 | BBY7SOP-00002 | EPA 6020A |
| Elements by ICPMS Low Level (dissolved) | 4 | N/A | 2012/07/09 | BBY7SOP-00002 | EPA 6020A |
| Na, K, Ca, Mg, S by CRC ICPMS (total) | 4 | N/A | 2012/07/10 | BBY7SOP-00002 | EPA 6020A |
| Elements by ICPMS Low Level (total) | 4 | N/A | 2012/07/09 | BBY7SOP-00002 | EPA 6020A |
| Ammonia-N | 4 | N/A | 2012/07/05 | BBY6SOP-00009 | SM-4500NH3G |
| Nitrate + Nitrite (N) | 3 | N/A | 2012/07/05 | BBY6SOP-00010 | USEPA 353.2 |
| Nitrate + Nitrite (N) | 1 | N/A | 2012/07/06 | BBY6SOP-00010 | USEPA 353.2 |
| Nitrite (N) by CFA | 3 | N/A | 2012/07/05 | BBY6SOP-00010 | EPA 353.2 |
| Nitrite (N) by CFA | 1 | N/A | 2012/07/06 | BBY6SOP-00010 | EPA 353.2 |
| Nitrogen - Nitrate (as N) | 3 | N/A | 2012/07/06 | BBY6SOP-00010 | Based on EPA 353.2 |
| Nitrogen - Nitrate (as N) | 1 | N/A | 2012/07/09 | BBY6SOP-00010 | Based on EPA 353.2 |
| Filter and HNO3 Preserve for Metals | 4 | N/A | 2012/07/04 | BBY6WI-00001 | EPA 200.2 |
| pH Water | 3 | N/A | 2012/07/05 | BBY6SOP-00026 | SM-4500H+B |
| pH Water | 1 | N/A | 2012/07/06 | BBY6SOP-00026 | SM-4500H+B |
| Sulphate by Automated Colourimetry | 3 | N/A | 2012/07/05 | BBY6SOP-00017 | SM4500-SO42 |
| Sulphate by Automated Colourimetry | 1 | N/A | 2012/07/06 | BBY6SOP-00017 | SM4500-SO42 |
| Total Dissolved Solids (Filt. Residue) | 4 | 2012/07/06 | 2012/07/09 | BBY6SOP-00033 | SM 2540C |
| Carbon (Total Organic) | 4 | N/A | 2012/07/06 | BBY6SOP-00003 | SM-5310C |
| Total Suspended Solids-LowLevel | 4 | 2012/07/06 | 2012/07/06 | BBY6SOP-00034 | SM-2540 D |

* Results relate only to the items tested.

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AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21



Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Sheleeza Mohamed, Burnaby Project Manager
Email: SMohamed@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.

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

## RESULTS OF CHEMICAL ANALYSES OF WATER

| Maxxam ID | | DV7216 | DV7217 | | DV7218 | | DV7219 | | |
|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2012/07/01 | 2012/07/01 | | 2012/07/01 | | 2012/07/01 | | |
| | **UNITS** | **KLAZA** | **IRON CREEK (A)** | **QC Batch** | **IRON CREEK (B)** | **QC Batch** | **IRON CREEK UP** | **RDL** | **QC Batch** |
| **Misc. Inorganics** | | | | | | | | | |
| Fluoride (F) | mg/L | 0.027 | 0.037 | 5980823 | 0.024 | 5980823 | 0.023 | 0.010 | 5980823 |
| **ANIONS** | | | | | | | | | |
| Nitrite (N) | mg/L | <0.0050(1) | <0.0050(1) | 5976843 | <0.0050(1) | 5980475 | <0.0050(1) | 0.0050 | 5976843 |
| **Calculated Parameters** | | | | | | | | | |
| Filter and HNO3 Preservation | N/A | FIELD | FIELD | ONSITE | FIELD | ONSITE | FIELD | N/A | ONSITE |
| Nitrate (N) | mg/L | 0.099 | 0.808 | 5970637 | <0.020 | 5970637 | 0.102 | 0.020 | 5970637 |
| **Misc. Inorganics** | | | | | | | | | |
| Weak Acid Dissoc. Cyanide (CN) | mg/L | <0.00050 | 0.00062 | 5991430 | 0.00085 | 5991430 | 0.00100 | 0.00050 | 5991430 |
| Alkalinity (Total as CaCO3) | mg/L | 24.8 | 13.7 | 5976044 | 6.32 | 5980847 | 5.91 | 0.50 | 5976044 |
| Total Organic Carbon (C) | mg/L | 2.60 | 3.96 | 5978787 | 6.01 | 5978787 | 7.26 | 0.50 | 5978787 |
| Alkalinity (PP as CaCO3) | mg/L | <0.50 | <0.50 | 5976044 | <0.50 | 5980847 | <0.50 | 0.50 | 5976044 |
| Bicarbonate (HCO3) | mg/L | 30.3 | 16.7 | 5976044 | 7.71 | 5980847 | 7.21 | 0.50 | 5976044 |
| Carbonate (CO3) | mg/L | <0.50 | <0.50 | 5976044 | <0.50 | 5980847 | <0.50 | 0.50 | 5976044 |
| Hydroxide (OH) | mg/L | <0.50 | <0.50 | 5976044 | <0.50 | 5980847 | <0.50 | 0.50 | 5976044 |
| **Anions** | | | | | | | | | |
| Dissolved Sulphate (SO4) | mg/L | <0.50 | 0.76 | 5974849 | <0.50 | 5978701 | <0.50 | 0.50 | 5974849 |
| Dissolved Chloride (Cl) | mg/L | <0.50 | <0.50 | 5974802 | <0.50 | 5978606 | <0.50 | 0.50 | 5974802 |
| **Nutrients** | | | | | | | | | |
| Ammonia (N) | mg/L | <0.0050 | 0.017 | 5974224 | 0.0063 | 5974224 | 0.034 | 0.0050 | 5974224 |
| Nitrate plus Nitrite (N) | mg/L | 0.099(1) | 0.808(1) | 5976841 | <0.020(1) | 5980464 | 0.102(1) | 0.020 | 5976841 |
| **Physical Properties** | | | | | | | | | |
| Conductivity | uS/cm | 48.8 | 39.1 | 5976049 | 16.3 | 5980851 | 17.8 | 1.0 | 5976049 |
| pH | pH Units | 7.48 | 7.14 | 5976055 | 7.09 | 5980852 | 6.89 | | 5976055 |
| **Physical Properties** | | | | | | | | | |
| Total Suspended Solids | mg/L | <1.0 | 33.3 | 5976681 | <1.0 | 5976681 | <1.0 | 1.0 | 5976681 |
| Total Dissolved Solids | mg/L | 26 | 28 | 5978389 | 12 | 5978389 | <10 | 10 | 5978389 |

N/A = Not Applicable
RDL = Reportable Detection Limit
(1) - Sample analysed past recommended hold time.

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

## LOW LEVEL DISSOLVED METALS IN WATER (WATER)

| Maxxam ID | | DV7216 | DV7217 | | DV7218 | | DV7219 | | |
|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2012/07/01 | 2012/07/01 | | 2012/07/01 | | 2012/07/01 | | |
| | **UNITS** | **KLAZA** | **IRON CREEK (A)** | **QC Batch** | **IRON CREEK (B)** | **QC Batch** | **IRON CREEK UP** | **RDL** | **QC Batch** |
| **Misc. Inorganics** | | | | | | | | | |
| Dissolved Hardness (CaCO3) | mg/L | 22.2 | 15.3 | 5970636 | 6.44 | 5970636 | 7.00 | 0.50 | 5970636 |
| **Dissolved Metals by ICPMS** | | | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | 26.2 | 22.0 | 5982874 | 110 | 5982874 | 82.0 | 0.20 | 5982874 |
| Dissolved Antimony (Sb) | ug/L | 0.081 | 0.141 | 5982874 | 0.044 | 5982874 | 0.034 | 0.020 | 5982874 |
| Dissolved Arsenic (As) | ug/L | 0.088 | 0.217 | 5982874 | 0.130 | 5982874 | 0.118 | 0.020 | 5982874 |
| Dissolved Barium (Ba) | ug/L | 22.7 | 13.7 | 5982874 | 9.90 | 5982874 | 9.75 | 0.020 | 5982874 |
| Dissolved Beryllium (Be) | ug/L | <0.010 | <0.010 | 5982874 | <0.010 | 5982874 | <0.010 | 0.010 | 5982874 |
| Dissolved Bismuth (Bi) | ug/L | <0.0050 | <0.0050 | 5982874 | <0.0050 | 5982874 | <0.0050 | 0.0050 | 5982874 |
| Dissolved Boron (B) | ug/L | <50 | <50 | 5982874 | <50 | 5982874 | <50 | 50 | 5982874 |
| Dissolved Cadmium (Cd) | ug/L | 0.0068 | 0.0125 | 5982874 | 0.0100 | 5982874 | 0.0083 | 0.0050 | 5982874 |
| Dissolved Chromium (Cr) | ug/L | <0.10 | <0.10 | 5982874 | 0.13 | 5982874 | 0.12 | 0.10 | 5982874 |
| Dissolved Cobalt (Co) | ug/L | 0.0117 | 0.162 | 5982874 | 0.0210 | 5982874 | 0.0254 | 0.0050 | 5982874 |
| Dissolved Copper (Cu) | ug/L | 0.449 | 1.17 | 5982874 | 0.170 | 5991969 | 1.00 | 0.050 | 5982874 |
| Dissolved Iron (Fe) | ug/L | 5.9 | 94.9 | 5982874 | 29.2 | 5982874 | 66.3 | 1.0 | 5982874 |
| Dissolved Lead (Pb) | ug/L | 0.0165 | 0.0315 | 5982874 | 0.0339 | 5982874 | 0.0202 | 0.0050 | 5982874 |
| Dissolved Lithium (Li) | ug/L | <0.50 | <0.50 | 5982874 | <0.50 | 5982874 | <0.50 | 0.50 | 5982874 |
| Dissolved Manganese (Mn) | ug/L | 0.112 | 54.5 | 5982874 | 0.613 | 5982874 | 1.16 | 0.050 | 5982874 |
| Dissolved Molybdenum (Mo) | ug/L | 0.065 | 0.064 | 5982874 | <0.050 | 5982874 | <0.050 | 0.050 | 5982874 |
| Dissolved Nickel (Ni) | ug/L | 0.087 | 0.257 | 5982874 | 0.316 | 5982874 | 0.352 | 0.020 | 5982874 |
| Dissolved Selenium (Se) | ug/L | <0.040 | <0.040 | 5982874 | <0.040 | 5982874 | <0.040 | 0.040 | 5982874 |
| Dissolved Silicon (Si) | ug/L | 3870 | 2440 | 5982874 | 3420 | 5982874 | 3320 | 100 | 5982874 |
| Dissolved Silver (Ag) | ug/L | <0.0050 | <0.0050 | 5982874 | <0.0050 | 5982874 | <0.0050 | 0.0050 | 5982874 |
| Dissolved Strontium (Sr) | ug/L | 50.8 | 30.7 | 5982874 | 14.4 | 5982874 | 16.1 | 0.050 | 5982874 |
| Dissolved Thallium (Tl) | ug/L | <0.0020 | <0.0020 | 5982874 | <0.0020 | 5982874 | <0.0020 | 0.0020 | 5982874 |
| Dissolved Tin (Sn) | ug/L | <0.20 | <0.20 | 5982874 | <0.20 | 5982874 | <0.20 | 0.20 | 5982874 |
| Dissolved Titanium (Ti) | ug/L | <0.50 | <0.50 | 5982874 | <0.50 | 5982874 | <0.50 | 0.50 | 5982874 |
| Dissolved Uranium (U) | ug/L | 0.0537 | 0.0182 | 5982874 | 0.0110 | 5982874 | 0.0050 | 0.0020 | 5982874 |
| Dissolved Vanadium (V) | ug/L | <0.20 | <0.20 | 5982874 | <0.20 | 5982874 | <0.20 | 0.20 | 5982874 |
| Dissolved Zinc (Zn) | ug/L | 0.52 | 0.92 | 5982874 | 0.51 | 5991969 | 1.13 | 0.10 | 5991969 |
| Dissolved Zirconium (Zr) | ug/L | <0.10 | 0.12 | 5982874 | 0.14 | 5982874 | 0.11 | 0.10 | 5982874 |
| Dissolved Calcium (Ca) | mg/L | 6.65 | 4.74 | 5973036 | 2.01 | 5973036 | 2.13 | 0.050 | 5973036 |
| Dissolved Magnesium (Mg) | mg/L | 1.35 | 0.832 | 5973036 | 0.346 | 5973036 | 0.410 | 0.050 | 5973036 |
| Dissolved Potassium (K) | mg/L | 0.258 | 0.196 | 5973036 | 0.269 | 5973036 | 0.113 | 0.050 | 5973036 |
| Dissolved Sodium (Na) | mg/L | 0.970 | 1.49 | 5973036 | 0.898 | 5973036 | 0.997 | 0.050 | 5973036 |
| Dissolved Sulphur (S) | mg/L | <10 | <10 | 5973036 | <10 | 5973036 | <10 | 10 | 5973036 |

RDL = Reportable Detection Limit

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

## LOW LEVEL TOTAL METALS IN WATER (WATER)

| Maxxam ID | | DV7216 | DV7217 | DV7218 | DV7219 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2012/07/01 | 2012/07/01 | 2012/07/01 | 2012/07/01 | | |
| | **UNITS** | **KLAZA** | **IRON CREEK (A)** | **IRON CREEK (B)** | **IRON CREEK UP** | **RDL** | **QC Batch** |
| **Calculated Parameters** | | | | | | | |
| Total Hardness (CaCO3) | mg/L | 22.7 | 15.3 | 6.44 | 7.13 | 0.50 | 5970635 |
| **Total Metals by ICPMS** | | | | | | | |
| Total Aluminum (Al) | ug/L | 27.6 | 87.2 | 120 | 94.6 | 0.20 | 5982879 |
| Total Antimony (Sb) | ug/L | 0.062 | 0.142 | 0.040 | 0.030 | 0.020 | 5982879 |
| Total Arsenic (As) | ug/L | 0.107 | 0.257 | 0.117 | 0.167 | 0.020 | 5982879 |
| Total Barium (Ba) | ug/L | 23.4 | 15.9 | 10.4 | 10.3 | 0.020 | 5982879 |
| Total Beryllium (Be) | ug/L | <0.010 | 0.014 | <0.010 | <0.010 | 0.010 | 5982879 |
| Total Bismuth (Bi) | ug/L | <0.0050 | <0.0050 | <0.0050 | <0.0050 | 0.0050 | 5982879 |
| Total Boron (B) | ug/L | <50 | <50 | <50 | <50 | 50 | 5982879 |
| Total Cadmium (Cd) | ug/L | 0.0060 | 0.0127 | 0.0113 | 0.0075 | 0.0050 | 5982879 |
| Total Chromium (Cr) | ug/L | <0.10 | 0.17 | 0.14 | 0.11 | 0.10 | 5982879 |
| Total Cobalt (Co) | ug/L | 0.0138 | 0.204 | 0.0297 | 0.0393 | 0.0050 | 5982879 |
| Total Copper (Cu) | ug/L | 0.391 | 1.21 | 0.929 | 0.830 | 0.050 | 5982879 |
| Total Iron (Fe) | ug/L | 6.6 | 218 | 33.3 | 98.1 | 1.0 | 5982879 |
| Total Lead (Pb) | ug/L | 0.0056 | 0.141 | 0.0345 | 0.0209 | 0.0050 | 5982879 |
| Total Lithium (Li) | ug/L | <0.50 | <0.50 | <0.50 | <0.50 | 0.50 | 5982879 |
| Total Manganese (Mn) | ug/L | 0.173 | 57.8 | 0.966 | 3.87 | 0.050 | 5982879 |
| Total Molybdenum (Mo) | ug/L | 0.062 | 0.059 | <0.050 | <0.050 | 0.050 | 5982879 |
| Total Nickel (Ni) | ug/L | 0.069 | 0.305 | 0.411 | 0.334 | 0.020 | 5982879 |
| Total Selenium (Se) | ug/L | <0.040 | <0.040 | <0.040 | <0.040 | 0.040 | 5982879 |
| Total Silicon (Si) | ug/L | 3890 | 2590 | 3360 | 3380 | 100 | 5982879 |
| Total Silver (Ag) | ug/L | <0.0050 | 0.0067 | <0.0050 | <0.0050 | 0.0050 | 5982879 |
| Total Strontium (Sr) | ug/L | 52.8 | 31.5 | 14.8 | 16.5 | 0.050 | 5982879 |
| Total Thallium (Tl) | ug/L | <0.0020 | <0.0020 | <0.0020 | <0.0020 | 0.0020 | 5982879 |
| Total Tin (Sn) | ug/L | <0.20 | <0.20 | <0.20 | <0.20 | 0.20 | 5982879 |
| Total Titanium (Ti) | ug/L | <0.50 | 1.74 | <0.50 | 0.60 | 0.50 | 5982879 |
| Total Uranium (U) | ug/L | 0.0622 | 0.0294 | 0.0122 | 0.0071 | 0.0020 | 5982879 |
| Total Vanadium (V) | ug/L | <0.20 | 0.38 | <0.20 | <0.20 | 0.20 | 5982879 |
| Total Zinc (Zn) | ug/L | 0.47 | 0.80 | 1.48 | 1.09 | 0.10 | 5982879 |
| Total Zirconium (Zr) | ug/L | <0.10 | 0.14 | 0.14 | 0.12 | 0.10 | 5982879 |
| Total Calcium (Ca) | mg/L | 6.74 | 4.77 | 2.00 | 2.17 | 0.050 | 5973037 |
| Total Magnesium (Mg) | mg/L | 1.43 | 0.833 | 0.353 | 0.414 | 0.050 | 5973037 |
| Total Potassium (K) | mg/L | 0.264 | 0.183 | 0.223 | 0.100 | 0.050 | 5973037 |
| Total Sodium (Na) | mg/L | 1.01 | 1.48 | 0.857 | 0.988 | 0.050 | 5973037 |
| Total Sulphur (S) | mg/L | <10 | <10 | <10 | <10 | 10 | 5973037 |

RDL = Reportable Detection Limit

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

| | |
|---|---|
| Package 1 | 8.0°C |

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

**General Comments**

Sample DV7216-01: 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.

Sample DV7217-01: 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.

Sample DV7218-01: 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.

Sample DV7219-01: 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.

Sample DV7218, Elements by ICPMS Low Level (dissolved): Test repeated.
Sample DV7219, Elements by ICPMS Low Level (dissolved): Test repeated.

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

## QUALITY ASSURANCE REPORT

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5974224 | Ammonia (N) | 2012/07/05 | 83 | 80 - 120 | 101 | 80 - 120 | 0.0054, RDL=0.0050 | mg/L | NC | 20 |
| 5974802 | Dissolved Chloride (Cl) | 2012/07/05 | 94 | 80 - 120 | 101 | 80 - 120 | <0.50 | mg/L | NC | 20 |
| 5974849 | Dissolved Sulphate (SO4) | 2012/07/05 | NC | 80 - 120 | 99 | 80 - 120 | <0.50 | mg/L | NC | 20 |
| 5976044 | Alkalinity (Total as CaCO3) | 2012/07/05 | NC | 80 - 120 | 95 | 80 - 120 | <0.50 | mg/L | 1.8 | 20 |
| 5976044 | Alkalinity (PP as CaCO3) | 2012/07/05 | | | | | <0.50 | mg/L | NC | 20 |
| 5976044 | Bicarbonate (HCO3) | 2012/07/05 | | | | | <0.50 | mg/L | 1.8 | 20 |
| 5976044 | Carbonate (CO3) | 2012/07/05 | | | | | <0.50 | mg/L | NC | 20 |
| 5976044 | Hydroxide (OH) | 2012/07/05 | | | | | <0.50 | mg/L | NC | 20 |
| 5976049 | Conductivity | 2012/07/05 | | | 99 | 80 - 120 | <1.0 | uS/cm | 0 | 20 |
| 5976681 | Total Suspended Solids | 2012/07/06 | | | 103 | 80 - 120 | <1.0 | mg/L | | |
| 5976841 | Nitrate plus Nitrite (N) | 2012/07/05 | NC | 80 - 120 | 106 | 80 - 120 | <0.020 | mg/L | NC | 25 |
| 5976843 | Nitrite (N) | 2012/07/05 | 96 | 80 - 120 | 100 | 80 - 120 | <0.0050 | mg/L | NC | 20 |
| 5978389 | Total Dissolved Solids | 2012/07/09 | NC | 80 - 120 | 94 | 80 - 120 | <10 | mg/L | 5.9 | 20 |
| 5978606 | Dissolved Chloride (Cl) | 2012/07/06 | 95 | 80 - 120 | 104 | 80 - 120 | <0.50 | mg/L | NC | 20 |
| 5978701 | Dissolved Sulphate (SO4) | 2012/07/06 | NC | 80 - 120 | 100 | 80 - 120 | <0.50 | mg/L | 0.6 | 20 |
| 5978787 | Total Organic Carbon (C) | 2012/07/06 | 108 | 80 - 120 | 109 | 80 - 120 | <0.50 | mg/L | NC | 20 |
| 5980464 | Nitrate plus Nitrite (N) | 2012/07/06 | NC | 80 - 120 | 106 | 80 - 120 | <0.020 | mg/L | NC | 25 |
| 5980475 | Nitrite (N) | 2012/07/06 | 100 | 80 - 120 | 103 | 80 - 120 | <0.0050 | mg/L | NC | 20 |
| 5980823 | Fluoride (F) | 2012/07/06 | NC | 80 - 120 | 100 | 80 - 120 | 0.010, RDL=0.010 | mg/L | NC | 20 |
| 5980847 | Alkalinity (Total as CaCO3) | 2012/07/06 | NC | 80 - 120 | 97 | 80 - 120 | <0.50 | mg/L | 1.9 | 20 |
| 5980847 | Alkalinity (PP as CaCO3) | 2012/07/06 | | | | | <0.50 | mg/L | NC | 20 |
| 5980847 | Bicarbonate (HCO3) | 2012/07/06 | | | | | <0.50 | mg/L | 1.9 | 20 |
| 5980847 | Carbonate (CO3) | 2012/07/06 | | | | | <0.50 | mg/L | NC | 20 |
| 5980847 | Hydroxide (OH) | 2012/07/06 | | | | | <0.50 | mg/L | NC | 20 |
| 5980851 | Conductivity | 2012/07/06 | | | 100 | 80 - 120 | <1.0 | uS/cm | 0.3 | 20 |
| 5982874 | Dissolved Aluminum (Al) | 2012/07/09 | 104 | 80 - 120 | 99 | 80 - 120 | 0.21, RDL=0.20 | ug/L | | |
| 5982874 | Dissolved Antimony (Sb) | 2012/07/09 | 105 | 80 - 120 | 100 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982874 | Dissolved Arsenic (As) | 2012/07/09 | 103 | 80 - 120 | 105 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982874 | Dissolved Barium (Ba) | 2012/07/09 | 101 | 80 - 120 | 100 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982874 | Dissolved Beryllium (Be) | 2012/07/09 | 93 | 80 - 120 | 91 | 80 - 120 | <0.010 | ug/L | NC | 20 |
| 5982874 | Dissolved Bismuth (Bi) | 2012/07/09 | 103 | 80 - 120 | 95 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982874 | Dissolved Cadmium (Cd) | 2012/07/09 | 100 | 80 - 120 | 99 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982874 | Dissolved Chromium (Cr) | 2012/07/09 | 98 | 80 - 120 | 100 | 80 - 120 | <0.10 | ug/L | NC | 20 |
| 5982874 | Dissolved Cobalt (Co) | 2012/07/09 | 95 | 80 - 120 | 96 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982874 | Dissolved Copper (Cu) | 2012/07/09 | 93 | 80 - 120 | 92 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982874 | Dissolved Iron (Fe) | 2012/07/09 | 107 | 80 - 120 | 108 | 80 - 120 | <1.0 | ug/L | NC | 20 |
| 5982874 | Dissolved Lead (Pb) | 2012/07/09 | 100 | 80 - 120 | 98 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982874 | Dissolved Lithium (Li) | 2012/07/09 | 99 | 80 - 120 | 98 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 5982874 | Dissolved Manganese (Mn) | 2012/07/09 | 105 | 80 - 120 | 103 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982874 | Dissolved Molybdenum (Mo) | 2012/07/09 | 103 | 80 - 120 | 97 | 80 - 120 | <0.050 | ug/L | NC | 20 |

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

## QUALITY ASSURANCE REPORT

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5982874 | Dissolved Nickel (Ni) | 2012/07/09 | 97 | 80 - 120 | 96 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982874 | Dissolved Selenium (Se) | 2012/07/09 | 106 | 80 - 120 | 105 | 80 - 120 | <0.040 | ug/L | NC | 20 |
| 5982874 | Dissolved Silver (Ag) | 2012/07/09 | 103 | 80 - 120 | 101 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982874 | Dissolved Strontium (Sr) | 2012/07/09 | 100 | 80 - 120 | 97 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982874 | Dissolved Thallium (Tl) | 2012/07/09 | 103 | 80 - 120 | 101 | 80 - 120 | <0.0020 | ug/L | NC | 20 |
| 5982874 | Dissolved Tin (Sn) | 2012/07/09 | 104 | 80 - 120 | 97 | 80 - 120 | <0.20 | ug/L | NC | 20 |
| 5982874 | Dissolved Titanium (Ti) | 2012/07/09 | 110 | 80 - 120 | 104 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 5982874 | Dissolved Uranium (U) | 2012/07/09 | 89 | 80 - 120 | 86 | 80 - 120 | <0.0020 | ug/L | NC | 20 |
| 5982874 | Dissolved Vanadium (V) | 2012/07/09 | 97 | 80 - 120 | 99 | 80 - 120 | <0.20 | ug/L | NC | 20 |
| 5982874 | Dissolved Zinc (Zn) | 2012/07/09 | 109 | 80 - 120 | 119 | 80 - 120 | <0.10 | ug/L | NC | 20 |
| 5982874 | Dissolved Boron (B) | 2012/07/09 | | | | | <50 | ug/L | NC | 20 |
| 5982874 | Dissolved Silicon (Si) | 2012/07/09 | | | | | <100 | ug/L | NC | 20 |
| 5982874 | Dissolved Zirconium (Zr) | 2012/07/09 | | | | | <0.10 | ug/L | NC | 20 |
| 5982879 | Total Aluminum (Al) | 2012/07/09 | 99 | 80 - 120 | 101 | 80 - 120 | 0.29, RDL=0.20 | ug/L | NC | 20 |
| 5982879 | Total Antimony (Sb) | 2012/07/09 | 99 | 80 - 120 | 103 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982879 | Total Arsenic (As) | 2012/07/09 | 97 | 80 - 120 | 105 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982879 | Total Barium (Ba) | 2012/07/09 | 98 | 80 - 120 | 102 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982879 | Total Beryllium (Be) | 2012/07/09 | 90 | 80 - 120 | 93 | 80 - 120 | <0.010 | ug/L | NC | 20 |
| 5982879 | Total Bismuth (Bi) | 2012/07/09 | 96 | 80 - 120 | 97 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982879 | Total Cadmium (Cd) | 2012/07/09 | 96 | 80 - 120 | 98 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982879 | Total Chromium (Cr) | 2012/07/09 | 93 | 80 - 120 | 99 | 80 - 120 | <0.10 | ug/L | NC | 20 |
| 5982879 | Total Cobalt (Co) | 2012/07/09 | 91 | 80 - 120 | 98 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982879 | Total Copper (Cu) | 2012/07/09 | 90 | 80 - 120 | 95 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982879 | Total Iron (Fe) | 2012/07/09 | 102 | 80 - 120 | 106 | 80 - 120 | <1.0 | ug/L | NC | 20 |
| 5982879 | Total Lead (Pb) | 2012/07/09 | 97 | 80 - 120 | 99 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982879 | Total Lithium (Li) | 2012/07/09 | 96 | 80 - 120 | 100 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 5982879 | Total Manganese (Mn) | 2012/07/09 | 99 | 80 - 120 | 105 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982879 | Total Molybdenum (Mo) | 2012/07/09 | 97 | 80 - 120 | 100 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982879 | Total Nickel (Ni) | 2012/07/09 | 92 | 80 - 120 | 101 | 80 - 120 | <0.020 | ug/L | NC | 20 |
| 5982879 | Total Selenium (Se) | 2012/07/09 | 104 | 80 - 120 | 104 | 80 - 120 | <0.040 | ug/L | NC | 20 |
| 5982879 | Total Silver (Ag) | 2012/07/09 | 99 | 80 - 120 | 103 | 80 - 120 | <0.0050 | ug/L | NC | 20 |
| 5982879 | Total Strontium (Sr) | 2012/07/09 | 97 | 80 - 120 | 102 | 80 - 120 | <0.050 | ug/L | NC | 20 |
| 5982879 | Total Thallium (Tl) | 2012/07/09 | 101 | 80 - 120 | 106 | 80 - 120 | <0.0020 | ug/L | NC | 20 |
| 5982879 | Total Tin (Sn) | 2012/07/09 | 96 | 80 - 120 | 101 | 80 - 120 | <0.20 | ug/L | NC | 20 |
| 5982879 | Total Titanium (Ti) | 2012/07/09 | 104 | 80 - 120 | 108 | 80 - 120 | <0.50 | ug/L | NC | 20 |
| 5982879 | Total Uranium (U) | 2012/07/09 | 84 | 80 - 120 | 86 | 80 - 120 | <0.0020 | ug/L | NC | 20 |
| 5982879 | Total Vanadium (V) | 2012/07/09 | 93 | 80 - 120 | 99 | 80 - 120 | <0.20 | ug/L | NC | 20 |
| 5982879 | Total Zinc (Zn) | 2012/07/09 | 108 | 80 - 120 | 113 | 80 - 120 | <0.10 | ug/L | NC | 20 |
| 5982879 | Total Boron (B) | 2012/07/09 | | | | | <50 | ug/L | NC | 20 |
| 5982879 | Total Silicon (Si) | 2012/07/09 | | | | | <100 | ug/L | NC | 20 |

AURCHEM EXPLORATIONS LTD.

Maxxam Job #: B257183
Report Date: 2012/08/21

## QUALITY ASSURANCE REPORT

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 5982879 | Total Zirconium (Zr) | 2012/07/09 | | | | | <0.10 | ug/L | NC | 20 |
| 5991430 | Weak Acid Dissoc. Cyanide (CN) | 2012/07/10 | 101 | 80 - 120 | 99 | 80 - 120 | <0.00050 | mg/L | NC | 20 |
| 5991969 | Dissolved Copper (Cu) | 2012/07/11 | | | 92 | 80 - 120 | <0.050 | ug/L | | |
| 5991969 | Dissolved Zinc (Zn) | 2012/07/11 | | | 107 | 80 - 120 | <0.10 | ug/L | | |

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
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 to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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 not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Aurchem Explorations Ltd.
15 Loganberry Lane
Whitehorse, Yukon Y1A 5W4

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

# CHAIN OF CUSTODY RECORD

Page 1 of 1

| INVOICE INFORMATION: | | REPORT INFORMATION (if differs from invoice): | | PROJECT INFORMATION: | | Laboratory Use Only: | |
|---|---|---|---|---|---|---|---|
| Company Name: | [redacted] | Company Name: | Aurchem Explorations Ltd. | Quotation #: | B20563 | MAXXAM JOB #: B257183 | BOTTLE ORDER #: 280134 |
| Contact Name: | Jillian Chown | Contact Name: | Jillian Chown | P.O. #: | | | |
| Address: | [redacted] LINDEMAN ROAD<br>WHITEHORSE YT Y1A [redacted] 5W4 | Address: | 15 Loganberry Lane<br>Whitehorse YT | Project #: | | | |
| Phone: | [redacted] Fax: [redacted] | Phone: | 867-456-4167 Fax: | Project Name: | | CHAIN OF CUSTODY #: C#280134-01-01 | PROJECT MANAGER: Shaleesa Mohamed |
| Email: | [redacted] chownjpc@gmail.com | Email: | chownjpc@gmail.com | Site #: | | | |
| | | | | Sampled By: | | | |

REGULATORY CRITERIA: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other _____

SPECIAL INSTRUCTIONS

ANALYSIS REQUESTED (Please be specific):

TURNAROUND TIME (TAT) REQUIRED:

Regular (Standard) TAT: ☐
(will be applied if Rush TAT is not specified):
Standard TAT = 5 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) ☐
Day ☐ 2 Day ☐ 3 Day ☐ Date Required: _____
Rush Confirmation Number: _____ (call lab for #)

| | Sample Barcode Label | Sample (Location) Identification | Date Sampled | Time Sampled | Matrix | Metals Field Filtered ? (Y / N) | Alkalinity, Conductivity, pH | Cl, F, SO4, NO2, NO3 | LL TSS, TDS | Cyanide WAD | Ammonia, TOC | Low Level Total Metals | Low Level Dissolved Metals | DOC | # of Bottles | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DV7216 | Klaza | July 1/12 | | Surface Water | | J | J | J | J | J | J | J | | 6 | |
| 2 | 217 | Iron Creek (a) | July 1/12 | | " | | J | J | J | J | J | J | J | | 6 | |
| 3 | 218 | Iron Creek (b) | July 1/12 | | " | | J | J | J | J | J | J | J | | 6 | |
| 4 | 219 | Iron Creek UP | July 1/12 | | " | | J | J | J | J | J | J | J | | 6 | |
| 5 | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |

B257183

| *RELINQUISHED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | RECEIVED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | # Jars Used and Not Submitted | Laboratory Use Only: Time Sensitive | Temperature (°C) on Receipt | Custody Seal Intact on Cooler? |
|---|---|---|---|---|---|---|---|---|---|
| Jillian Chown | 12/07/03 | | [redacted] LOUISE LAU | 2012/07/04 | 11:05 | | ☐ | 8, 8, 8 | ☐ Yes ☐ No N/A |

* 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

# Appendix C

2005 ABA Lab results

# Appendix D

Email from Scott Davidson, Senior Project Manager, Access Consulting.

From: Scott Davidson <sdavidson@accessconsulting.ca>
Sent: Friday, November 30, 2012 9:03 AM
To: Jillian Chown
Subject: Aurchem Geochemical Results

Hi Jillian,

As per our earlier discussion I am currently finalizing the letter on the sample results you provided to me to review.

It is my understanding that the samples were collected using rotary core drilling with one sample being collected from the ore zone and one sample being collected from the waste rock just above the ore zone. The samples are all of low sulphur content (all less than 0.02%) with little acid generation potential (maximum of 0.6 kgCaCO3/t) . The neutralization potential of the rocks is also low (ranging from 3 to 11 kg CaCO3/t), however, there is sufficient neutralization potential within the analyzed samples that they are all classified as non-acid generating with neutralization potential ratios ranging from 4.8 to 70.4.

If you have any questions than please do not hesitate to contact me.

Regards,

Scott

Scott Davidson, M.Sc., P.Geo. (BC), P.Geol. (NT/NU)
Senior Project Manager

P 867 668-6463 x239
F 867 667-6680
C 867 334-6002

Access Consulting Group
#3 Calcite Business Centre
151 Industrial Road
Whitehorse, Yukon
Y1A 2V3