



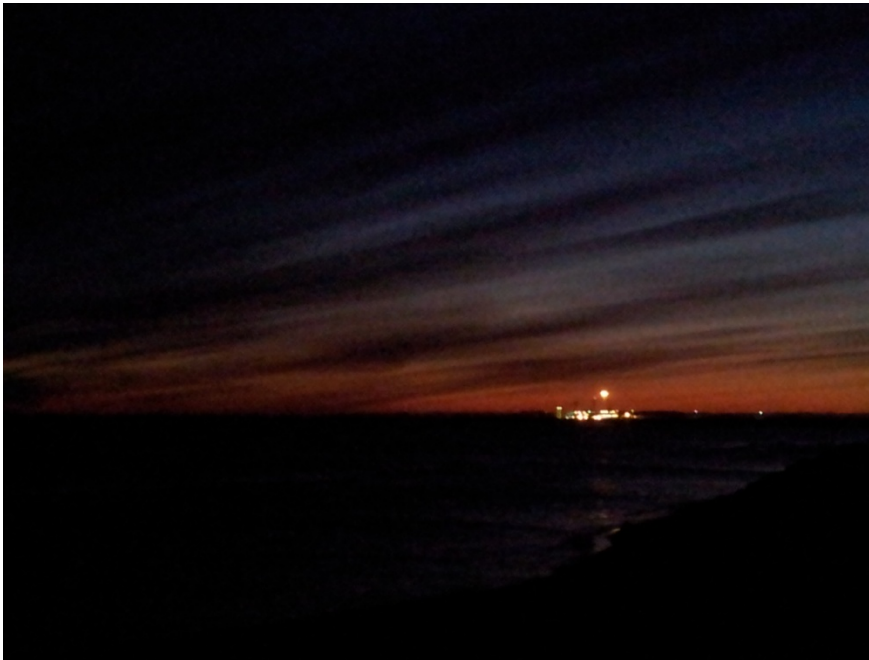
Alaska Gold Company LLC  
A BSNC Company

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## NANUUQ GOLD PROJECT

### Annual Monitoring Report

2016



**Submitted to:**

Alaska  
Department of  
Environmental  
Conservation

and

Alaska  
Department of  
Natural  
Resources

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**Appendix**

Electronic file      Water Chemistry Excel Spreadsheet

# 1 Introduction

This annual report has been prepared by Alaska Gold Company, LLC (AGC) in accordance with Alaska Department of Natural Resources (ADNR) Reclamation Plan Approval (RPA) F20159578. It covers monitoring activities at the Nanuuq Gold Project located near Nome, Alaska (Figure 1) for the time period of January 1, 2016 through the August 2016 annual well sampling. The Nanuuq Gold Project is comprised of the Rock Creek Mine and Mill and the Big Hurrah site.

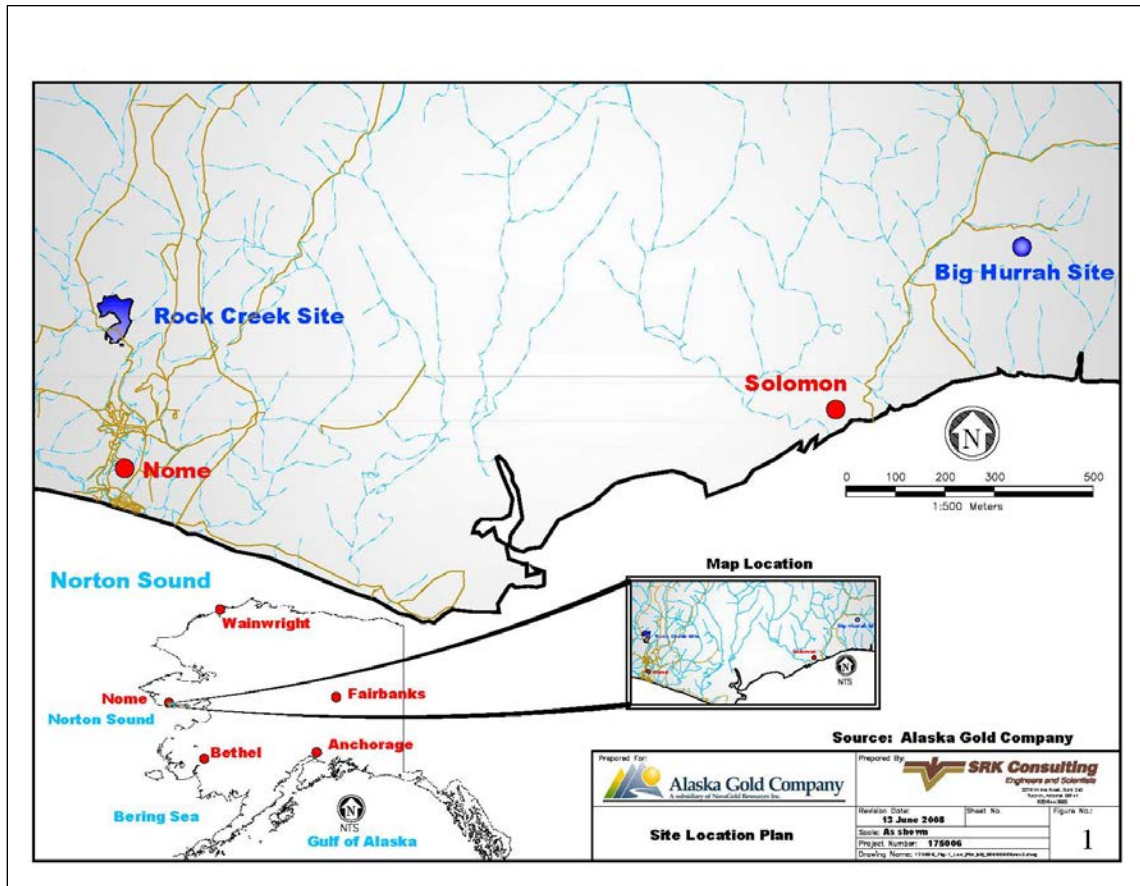


Figure 1. Nanuuq Gold Project locations.

# 2 Summary

Reclamation of the Rock Creek mine was completed in 2015 in accordance with reclamation plan F20159578. Big Hurrah is in compliance with the reclamation rules. As such, no further reclamation is contemplated at Rock Creek or Big Hurrah.

Other industrial, commercial, cultural, or miscellaneous uses of the properties are independent of State of Alaska mining reclamation rules. A purchase contract remains in effect on milling equipment, which is currently scheduled to execute in mid-2018.

Field observations of Rock Creek reclamation revealed minor rill erosion in the area of the Main Pit, which were recontoured and – in some cases – rocked. Vegetation growth has been as good as or better than anticipated. Wildlife including bear, moose, ptarmigan, rabbit, waterfowl, fox, and muskox has been observed onsite.

### **3 Nanuuq Activities**

Site activities involved monitoring and minor erosion repair.

### **4 Disturbance and Reclamation**

No additional land was disturbed during the quarter.

### **5 Stormwater Management**

The site has been reclaimed. Only the facility area remains subject to the 2015 MSGP. Visual inspections of all diversion structures, outfalls, and BMPs are conducted as described in the updated Rock Creek Storm Water Pollution Prevention Plan (SWPPP).

BMP inspections were conducted weekly and additional measures were implemented as needed according to the updated SWPPP maps.

### **6 Reportable Spills**

There were no reportable spills during the quarter.

### **7 Monitoring (Water Quality)**

Environmental monitoring of water quality is conducted by AGC as specified by reclamation plan requirements contained in the October 7, 2015 Nanuuq Project (Rock Creek Mine) Inspection Report (ADNR).

The analytical monitoring program includes water chemistry sampling of groundwater in two wells. Water samples for water chemistry analysis were submitted to SGS labs in Anchorage. Table 1 shows the parameters that are analyzed for the various water samples.

Table 1. Water chemistry sampling parameters.

Parameter	Ground Water TCP	Surface Water TCP	Surface Water APDES Permit	Contained Water TCP	Treated Water UIC Permit	Treated Water APDES Permit
Aluminum*	X	X	X	X	X	X
Antimony*	X	X	X	X	X	X
Arsenic*	X	X	X	X	X	X
Barium*	X	X	X	X	X	X
Beryllium*	X	X	X	X	X	X
Cadmium*	X	X	X	X	X	X
Calcium*	X	X	X	X	X	X
Chromium*	X	X	X	X	X	X
Cobalt*	X	X	X	X	X	X
Copper*	X	X	X	X	X	X
Iron*	X	X	X	X	X	X
Lead*	X	X	X	X	X	X
Magnesium*	X	X	X	X	X	X
Manganese*	X	X	X	X	X	X
Molybdenum*	X	X	X	X	X	X
Nickel*	X	X	X	X	X	X
Phosphorus*	X	X	X	X	X	X
Potassium*	X	X	X	X	X	X
Selenium*	X	X	X	X	X	X
Silicon*	X	X	X	X	X	X
Silver*	X	X	X	X	X	X
Sodium*	X	X	X	X	X	X
Strontium*	X	X	X	X	X	X
Thallium*	X	X	X	X	X	X
Tin*	X	X	X	X	X	X
Vanadium*	X	X	X	X	X	X
Zinc*	X	X	X	X	X	X
pH**	X	X	X	X	X	X
Conductivity	X	X	X	X	X	X
Total Dissolved Solids	X	X	X	X	X	X
Alkalinity	X	X	X	X	X	X
Acidity	X	X				
Ammonia-N	X	X		X		
Chloride	X	X	X	X	X	X
Fluoride	X	X	X	X	X	X
Sulfate	X	X	X	X	X	X
Cyanide (WAD)	X	X	X	X	X	X
Mercury	X	X	X	X		X
Total Suspended Solids	X	X	X	X		X
Nitrate/Nitrite-N	X	X		X	X	

\*Metals analyzed for total and dissolved concentrations, \*\*pH is measured in the field and laboratory

## 7.1 Contained Water

During the quarter, there was no contained water at the Nanuuq site.

## 7.2 Surface Water

Surface water sampling is not required by the current monitoring program and none was conducted.

### 7.2.1 Big Hurrah

There is no requirement or need for surface or groundwater monitoring at Big Hurrah at this time and none was conducted during the year.

## 7.3 Groundwater

The ongoing AGC groundwater monitoring program was developed to help identify potential effects – if any – on groundwater down gradient of the reclaimed Tailings Storage Facility (TSF) and Recycle Water Pond (RWP). Conditions down gradient of the TSF and RWP are monitored at wells MW03-05 and MW08-14B, respectively.

Groundwater samples are collected annually in August. Well MW03-05 is purged by dedicated submersible pump and Well MW08-14B is purged with a surface peristaltic pump. Past sample purging of the latter well was conducted by bailer, which agitated undeveloped slimes resulting in turbid samples. Roughly 5 gallons of water have been purged by bailer prior to excess drawdown and inability to obtain a sample. Use of the peristaltic pump allowed 7 gallons to be purged over a two and one half hour period. The sample was only slightly cloudy indicating far less suspension of undeveloped well sediment.

An Excel spreadsheet of the water chemistry data for 2016 is provided in the electronic appendix to this report.

## 7.4 Dissolved Groundwater Chemistry

### 7.4.1 TSF

Dissolved arsenic concentration in groundwater down gradient of the TSF (MW03-05) has been consistent since second quarter 2013. At this location – as well as at Rock Creek in general – arsenic concentrations have been characteristically above AWQS (Figure 2).

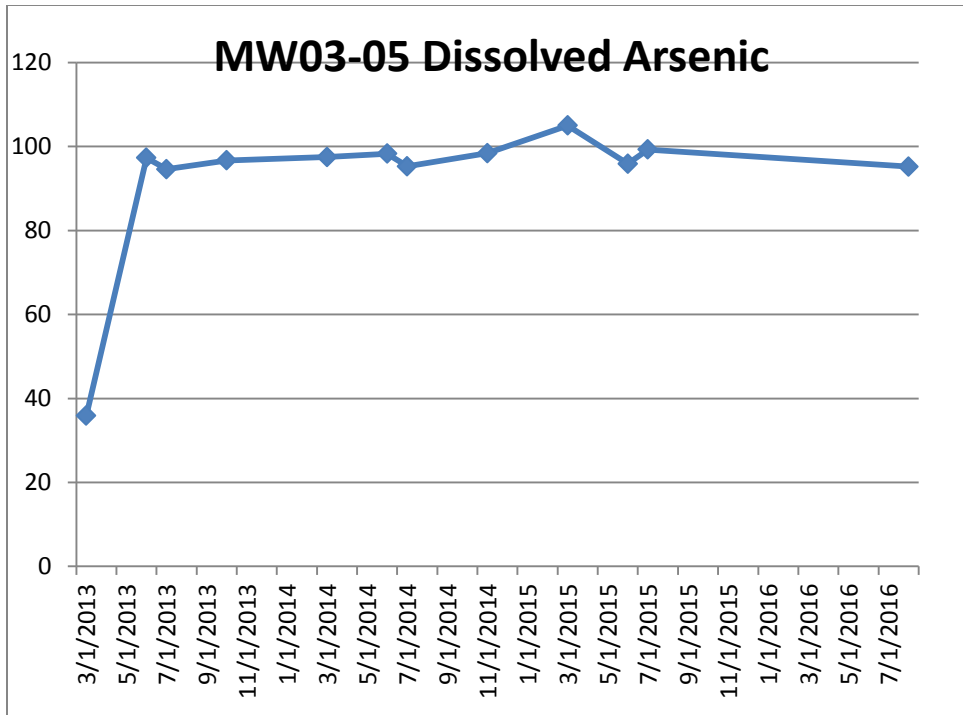


Figure 2. MW03-05 dissolved arsenic (TSF) in ug/L.

Zinc concentration remained consistent with the past two years of data (Figure 3).

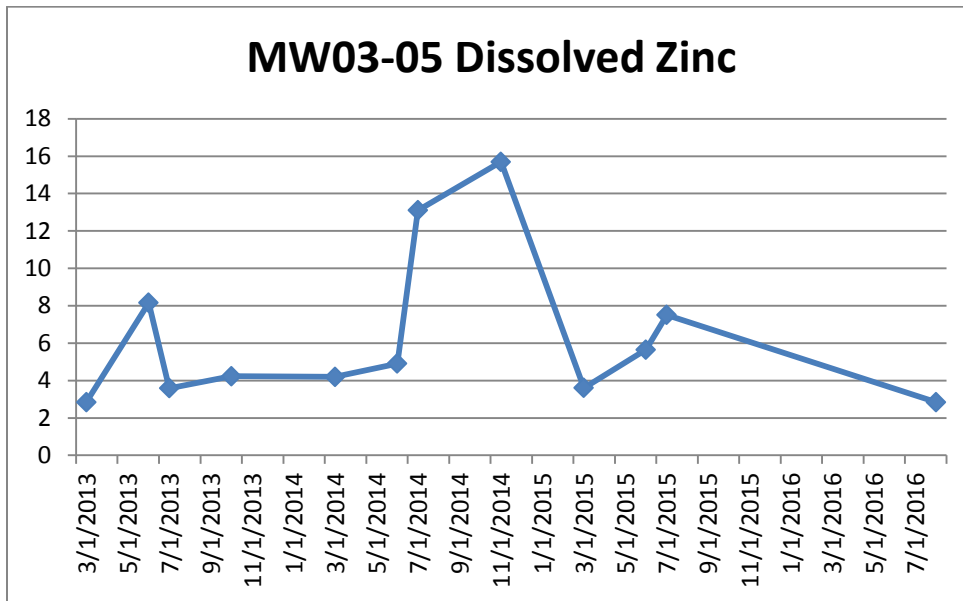


Figure 3. MW03-05 dissolved zinc (TSF) in ug/L.

Antimony in well MW03-05 remained at the level seen over the past two years following an anomalous sample in the first quarter of 2015 (Figure 4).



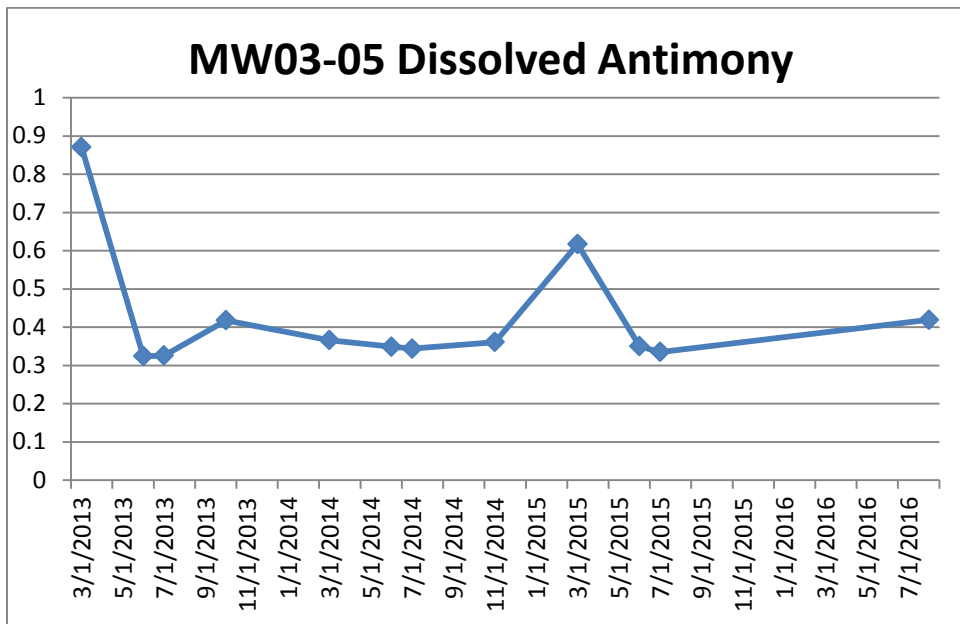


Figure 4. MW03-05 dissolved antimony (TSF) in ug/L.

Dissolved iron remained at the level measured in the past two summer samplings at roughly 850 ug/l (Figure 5).

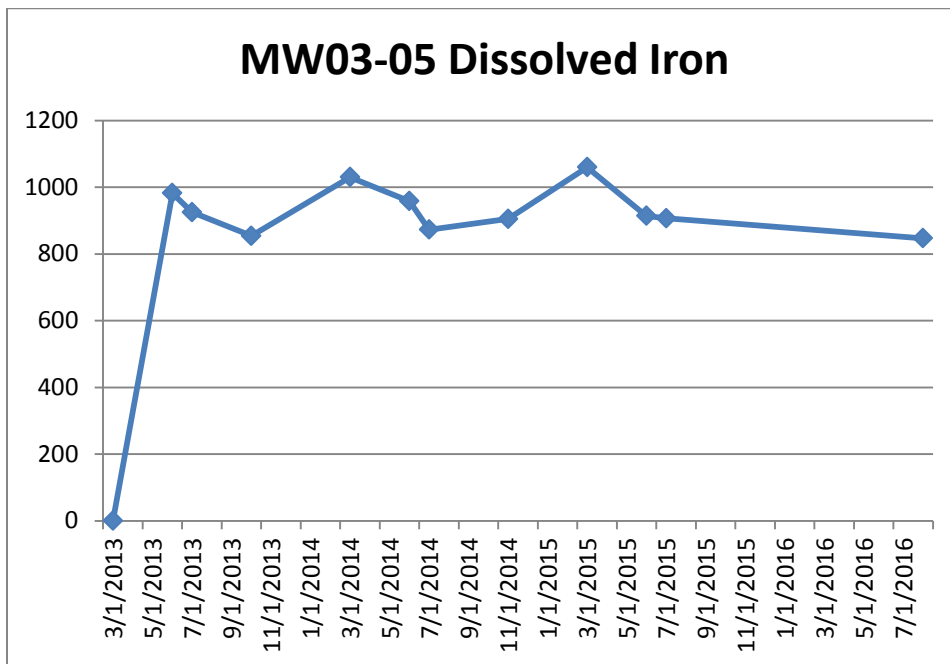


Figure 5. MW03-05 dissolved iron (TSF) in ug/L.

### 7.4.2 RWP

Past quarterly monitoring reports have provided data for well MW08-14A, which has now been deleted from the sampling program. Well MW08-14B is the only well below the RWP still sampled and results for that well are presented below.

Other than one sample in summer 2015, arsenic has been non-detect in MW08-14B. (Figure 6).

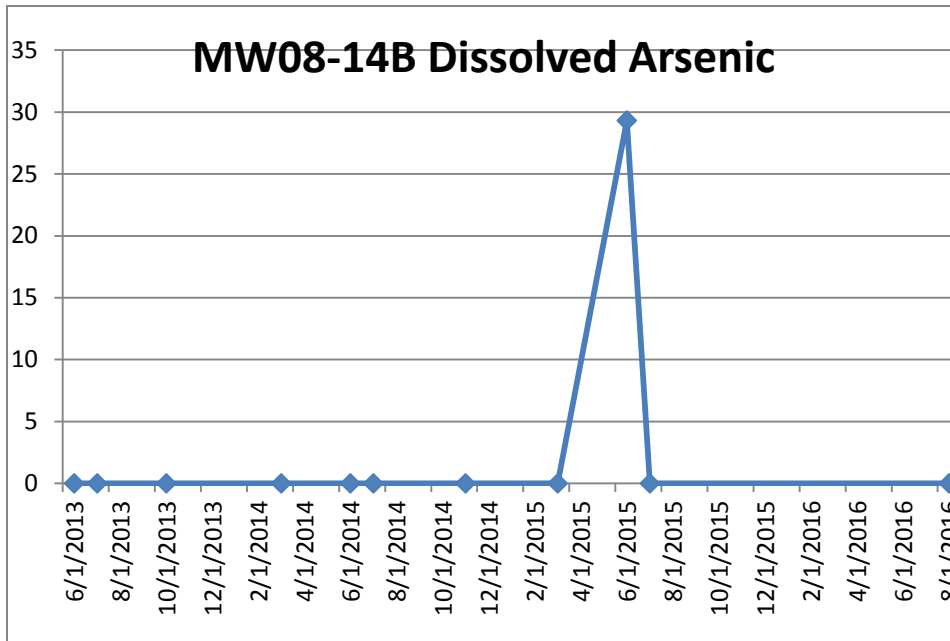


Figure 6. MW08-14B dissolved arsenic (RWP) in ug/L.

Consistent with past data shown for well MW08-14A, dissolved antimony has also been non-detect in this well with the exception of an anomalous spike in summer 2015 (Figure 7).

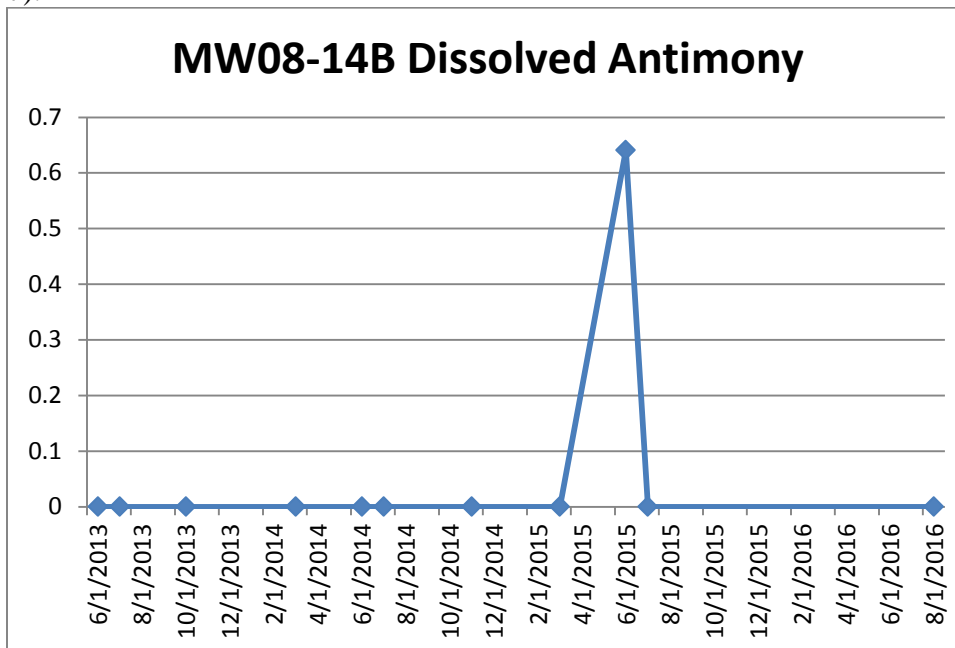


Figure 7. MW08-14B dissolved antimony (RWP) in ug/L.

Dissolved zinc in MW08-14B has shown a slight downward trend throughout the period of record (Figure 8). Spikes are observed in spring of each year in 2014 and 2015, but the single sample of 2016 is on the downward trend.

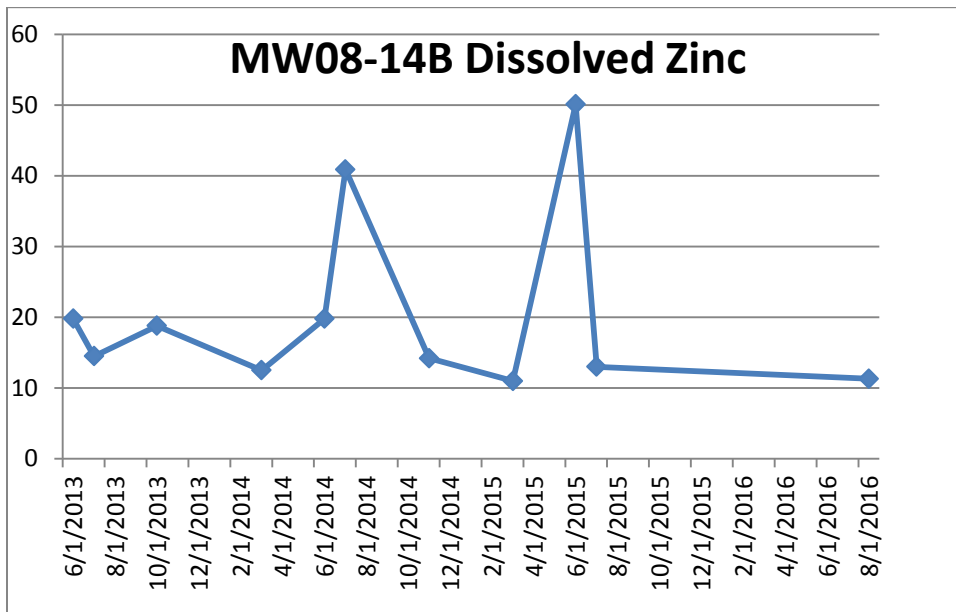


Figure 8. MW08-14B dissolved zinc (RWP) in ug/L.

Dissolved iron below the RWP (MW08-14B) is consistent with data previously shown for well MW08-14A (Figure 9). There is a spike in the spring 2015 sample – consistent with other constituents for this sample – but otherwise below 2000 ppb on a consistent basis.

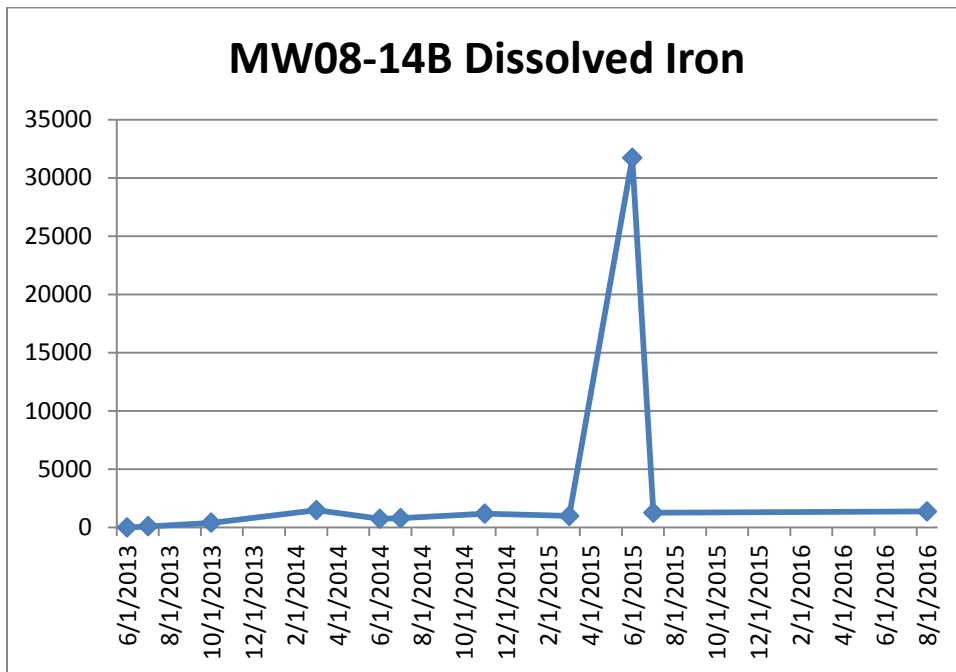


Figure 9. MW08-14B dissolved iron (RWP) in ug/L.

### 7.4.3 Total Dissolved Solids

Continuing past trends, the AWQS for TDS in drinking water (500 ppm) was met below the TSF, but exceeded below the reclaimed RWP (Figure 10). Variability in TDS remained low throughout the past two years.

Both MW03-05 and MW08-14B are calcium sulfate type waters. MW08-14B exhibits higher major ion concentrations – largely as calcium and sulfate – but generally lower trace metal concentrations.

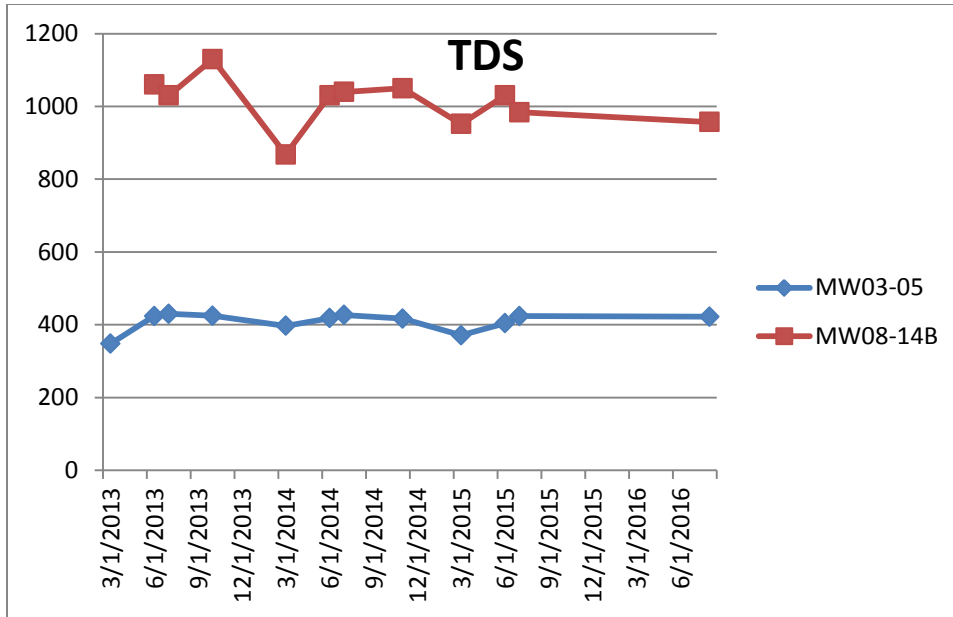


Figure 10. TDS in wells down gradient of the TSF (MW03-05) and RWP (MW08-14B) in ug/L.

### 7.5 Cyanide Monitoring of Tailings

WAD cyanide is measured in the two well samples. There have been three results above detection limits over the past three years (Table 2). All other samples are non-detect.

Table 2. WAD cyanide reported above detection limits over past three years. All are reported as laboratory ‘estimates’.

Well	Date	CN WAD
MW03-05	10/16/2013	0.0028 mg/L
MW03-05	6/5/2014	0.0025 mg/L
MW08-14B	6/5/2014	0.0022 mg/L

## 8 Monitoring (Visual)

### 8.1 Groundwater Elevations

Static water levels were measured in the two monitoring wells during 2016. Wells were not frozen at the time of measurement.

Water level in the TSF down gradient well (MW03-05) showed no change from August 2015 (Figure 11).

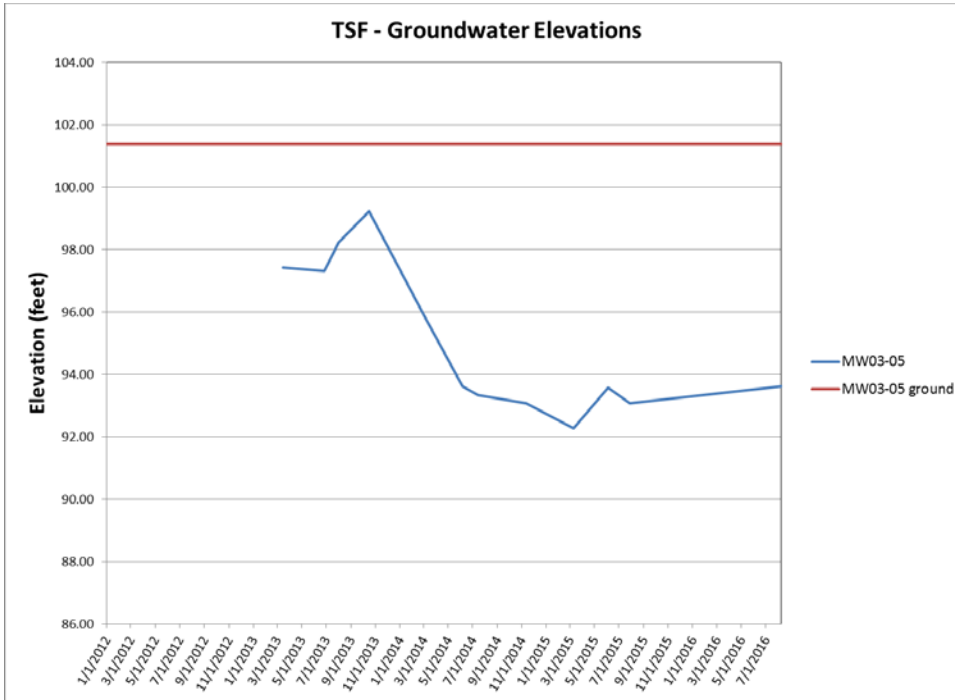


Figure 11. Water levels in MW03-05 down gradient of reclaimed TSF.

Water levels in the RWP down gradient well (MW08-14B) showed recovery consistent with late summer during the past three years (Figure 12).

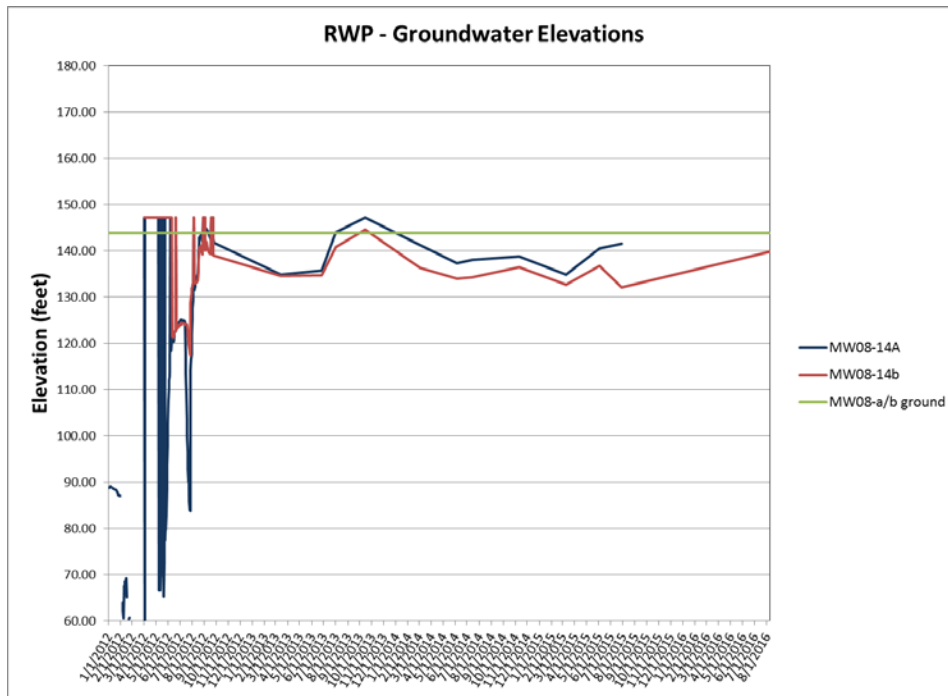


Figure 12. Water level in wells MW08-14A and B down gradient of RWP.

## 8.2 Monitoring Well Visual Inspections

As part of the groundwater monitoring program all sampled monitoring wells are visually inspected at the time of groundwater sampling. No damage or unusual conditions were observed during these inspections.

## 8.3 SPCC – Containment

Visual checks of fuel containments were conducted during the quarter. No physical damage was observed in containment structures. All fuel tanks at the mine and mill site have been pumped dry or drained.

## 8.4 SWPPP Structures

BMPs were operational during the year. No anomalies were observed. During the runoff season – generally mid-May through early October – AGC staff conducts regular site inspections of all stormwater BMPs in accordance with the Rock Creek Mine SWPPP.

## 8.5 Wildlife Monitoring

Wildlife sightings included musk oxen, fox, ptarmigan, brown bear, moose, and waterfowl.

## APPENDIX A

Water Chemistry Data 2016 (Excel spreadsheet transmitted separately)