

## MEMORANDUM

VIA EMAIL

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FROM: DAVE HINRICHS, NEWFIELDS  
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SUBJECT: SURFACE WATER AND GROUNDWATER MONITORING IN 2014  
EAGLE RIVER MINE SITE

DATE: JANUARY 27, 2014

CC: JEFF GROU, CBS OPERATIONS INC.  
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This Memorandum describes the monitoring program that CBS Operations Inc. (CBS) proposes for 2014.

In the spring, typically described as March and April prior to snowmelt that generates flows greater than 150 cubic feet per second, copper, cadmium, and zinc concentrations within Segment 5 of the Eagle River may at times exceed the Water Quality Standards, effective January 1, 2009. Numerous studies and zinc loading estimates have identified a seasonal zinc load that enters Segment 5a between Eagle River stations E-3 and E-10, the Belden area. The primary zinc load is believed to be a short-term pulse of mineralized groundwater from the Belden area of the mine.

### Monitoring Objectives

The objectives of 2014 monitoring are to assess the timing and duration, of spring metals loading to the river, to provide data for monitoring long-term water quality trends, and to assess the on-going functionality of the remedy. While data will be compared to the water quality standards, true compliance monitoring will not commence at the Site until additional remedial activities have been completed.

### Monitoring Program

The proposed monitoring program focuses on Segment 5 of the Eagle River.

### Surface Water Monitoring Locations

The Eagle River will be monitored at:

- E-3, Eagle River above Belden, Segment 2 – *when ice/snow conditions allow*
- E-10, Eagle River above Rock Creek, Segment 5a
- E-12A, Eagle River below Old Tailings Pile and Rex Flats, Segment 5a
- E-15, Eagle River below Cross Creek, Segment 5b
- E-22, Eagle River below Minturn, Segment 5c



Eagle River tributaries will be monitored at:

- T-10, Rock Creek at mouth
- T-18, Cross Creek at culvert near mouth.

### **Surface Water Monitoring Frequency**

Water quality samples will be collected at each of the above-listed Surface Water Monitoring locations every other week in March and April, terminating when river flow exceeds approximately 150 cfs. An additional round of water quality samples will also be collected from all listed locations in September or October.

### **Surface Water Analyte List**

The following field parameters and analyses will be measured in surface water samples:

- Specific Conductance, field
- Temperature, field
- Arsenic, total recoverable
- Cadmium, dissolved
- Calcium, dissolved
- Copper, dissolved
- Magnesium, dissolved
- Zinc, dissolved.

### **Flow Measurements**

Flow estimates for the river will be made using the USGS gage at station E-12A and the correlation curves for other main stem stations established in the 2007 Eagle Mine Site Annual Report. Flow for Rock Creek station T-10 will be estimated using an equation for flow in a 72-inch diameter pipe. The estimate requires two measurements, the depth of water at the invert and the velocity of flow in feet/second (the culvert length of 95 feet divided by the time in seconds). Flow for Cross Creek station T-18 will be made using the USGS gage at Cross Creek near Minturn (USGS 09056100).

### **Underground Mill Water Level Monitoring**

The water that accumulates in the underground Mill was found to be elevated and was pumped down in November 2013. The shallow pool in the Mill will be visually inspected twice a year and pumped out as necessary to maintain a low pool level.

### **East Trench Groundwater Level Monitoring**

A Hobo water level logger was installed in the ET-1 monitoring well at the East Trench in the January 2013. The HOBO U20 loggers automatically record water levels at 18-hour intervals. Data from the data logger will be downloaded periodically and used to monitor the effect of 2013 maintenance activities on the East Trench groundwater collection system.