

# STATE OF COLORADO

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## DIVISION OF RECLAMATION, MINING & SAFETY

Department of Natural Resources

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February 15, 2013

Mr. Nick Cotts  
Newmont Mining Corporation  
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Mr. Larry Fiske, Site Manager  
Idarado Mining Company  
Newmont Mining Corporation  
6363 S. Fiddlers Green Circle  
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Ms. Denise W. Kennedy  
Holland & Hart, LLP  
555 17<sup>th</sup> Street, Suite 3200  
Denver, Colorado 80202

RE: Idarado Red Mountain Creek Evaluation of Zinc Loading

Dear Messrs. Cotts, Fiske and Ms. Kennedy,

Thank you for submitting the *Red Mountain Creek Evaluation of Zinc Loading* (the *Evaluation Report*), dated December 31, 2012, which presents the results of the September, 2012 water quality sampling investigation and evaluation to identify remaining sources of significant zinc loading to Red Mountain Creek. The report also described additional sampling and investigations to be conducted in 2013 to confirm report findings and develop information necessary to evaluate potential remedial measures.

Upon review of the *Evaluation Report*, the State offers the following recommendations to enhance data evaluation and development of additional remedial measures:

### **Section 3.2 Sampling Execution**

- 1) Please provide a smaller scale map than that presented in Figure 2 such that sampling locations can be more clearly depicted.

John W. Hickenlooper  
Governor

Mike King  
Executive Director

Loretta E. Pineda  
Division Director

### **Section 3.2.2 Surface Water Quality Sampling**

- 1) The *Evaluation Report* noted that “sampling teams began near the headwaters of the drainage basin area and progressed downstream in Red Mountain Creek over the course of the three day period.” The *RMC Investigation Work Plan*, Standard Operating Procedures, Section 4.1 (4), indicated that sample sites would be approached from downstream toward upstream locations to avoid disturbing sediments. This protocol should be followed in all subsequent sampling efforts.

### **Section 4.1.7 Segment 7**

- 1) Idarado’s *2012 Third Quarter Report* noted that the Treasury Tunnel pump back system was not in operation from June 6 through the end of the quarter, i.e., September 30, 2012. It is noted that the flow of the Treasury Tunnel at the portal (A-7) was 17.7 gallons per minute (gpm). In 1997, Idarado proposed to the State an interim plan to pump approximately 60 – 80 gallons per minute of Treasury Tunnel water to the Meldrum Tunnel, which discharges into the San Miguel River Watershed. Idarado indicated that they will submit plans for the expansion of the Treasury infiltration system as soon as these plans are finalized. Please ensure that the pump back of Treasury Tunnel water is not operating during all future sampling efforts.

### **Section 4.1.8 Segment 8**

- 1) Utilizing the flow data and mass balance calculations provided in Table 3, the nonpoint source contribution of dissolved zinc loading in Segment 8, within which RMT-2 is located, increased by 6.73 pounds per day, constituting approximately 21% of the zinc load measured at RMC1. Utilizing the “normalizing” flow rates measured by the United States Geological Survey (USGS) in 2002, the nonpoint source contribution of dissolved zinc loading in Segment 8 increased by 2.73 pounds per day, constituting approximately 5% of the zinc load measured at RMC1.
- 2) The combined zinc loading from the three seeps observed flowing from the toe of Red Mountain Tailings Pile number 2 (RMT-2) totals 1.76 pounds per day, constituting approximately 5% of the dissolved load at RMC-1.
- 3) The Colorado Department of Public Health and Environment’s (CDPHE’s) Hazardous Materials and Waste Management Division will work with CDPHE’s Water Quality Control Division regarding point sources identified as seeps located at the Buried Tailings, RMT-2, Barstow T. Infiltration, Treasury T. Infiltration system, Genessee T. Infiltration, etc.

#### **Section 4.1.10 Segment 10**

- 1) Pursuant to RAP figure 47.10, there are two draining adits at the Guston: the “primary portal” is the lower elevation adit, and the “secondary portal” is the higher elevation. It is understood that the “primary portal” was not flowing during the September 2012 sampling event. Please include sampling of both portals in future sampling efforts.
- 2) According to Figure 1 of the *Evaluation Report*, Governor Gulch appears to drain into Red Mountain Creek from the west side of the basin within Segment 10. This flow and corresponding metal loading was not accounted for, which may explain some of the flow and loading discrepancies noted in Segments 10 and 11.
- 3) Please include flows and a metals analysis from Governor Gulch if a new mass balance sampling effort is conducted.

#### **Section 4.1.11 Segment 11**

- 1) According to Figure 1 of the *Evaluation Report*, Galena Lion Gulch appears to drain into Red Mountain Creek from the west side of the basin within Segment 11. This flow and corresponding metal loading was not accounted for, which may explain some of the flow and loading discrepancies noted in Segment 11.
- 2) Please include flows and a metals analysis from Galena Lion Gulch if a new mass balance sampling effort is conducted.

#### **Section 4.1.16 Segment 16**

- 1) According to Figure 1 of the *Evaluation Report*, McIntyre Gulch appears to drain into Red Mountain Creek from the west side of the basin within Segment 16. This flow and corresponding metal loading was not accounted for, which may explain some of the flow and loading discrepancies noted in Segment 16.
- 2) Please include flows and a metals analysis from McIntyre Gulch if a new mass balance sampling effort is conducted.

#### **Section 4.1.17 Segment 17**

- 1) According to Figure 1 of the *Evaluation Report*, Monument Gulch appears to drain into Red Mountain Creek from the west side of the basin within Segment 17. This flow and corresponding metal loading was not accounted for, which may explain some of the flow and loading discrepancies noted in Segment 17.
- 2) Review of the Ironton Park Topographic map, the Beaver and Belfast mines, and the Larson Brothers mines are located on the west side of the valley in Segment 17.
- 3) Please include flows and metals analyses from Monument Gulch, and all draining mines if a new mass balance sampling effort is conducted.

#### **Section 5.0 Analysis of Existing Data**

##### **Section 5.1 Idaho RAP Monitoring**

- 1) Red Mountain Creek Performance Objective Water Quality sampling results taken from 2005-2011 indicate that pre-remediation zinc concentrations have been reduced by approximately 25% during the sampling period. Please compare pre-remediation high- and low-flow water quality data with 2005 - 2012 biannual water quality data in an effort to identify the remedial elements that have been most effective in reducing zinc loads to Red Mountain Creek.
- 2) Please provide data from historic RMT2 peizometer sampling.

##### **Section 5.2 United States Geological Survey (USGS) Investigation**

- 1) The *Evaluation Report* states that “Because the tracer-dilution method is less variable than using hand-held instrumentation to measure stream flow, and since the flow rates calculated during the USGS sampling event were similar to flow rates observed during this study, the USGS flow rates were incorporated into the mass balance as a way of “normalizing” flow data measured during this study to verify if a few of the large non-point source gains in calculated zinc loading may be explained by errors in flow measurement as previously stated in Section 4.”
- 2) To avoid flow measurement variations and/or errors in the future, please consider using the tracer-dilution method of measuring flow if a new mass balance sampling effort is conducted.

## Section 6.0 Summary of Findings and Further Investigation

- 1) The *Evaluation Report* listed the eight major point sources in order of decreasing zinc loading contributions. The State would interject the combined three RMT-2 seeps as number 8, moving the buried tailings seep to position number 9 as follows:

i.)	Genessee Adit (14.44 lbs/day)	67.0% of zinc loading at RMC-1
ii.)	Rouville Portal (5.02 lbs/day)	11.4% of zinc loading at RMC-1
iii.)	Joker Tunnel (4.68 lbs/day)	10.6% of zinc loading at RMC-1
iv.)	Treasury Tunnel (4.45 lbs/day)	12.4% of zinc loading at RMC-1
v.)	Red Mountain Adit (4.19 lbs/day)	11.9% of zinc loading at RMC-1
vi.)	National Bell Portal (2.62 lbs/day)	04.4% of zinc loading at RMC-1
vii.)	Guston Portal (2.49 lbs/day)	05.6% of zinc loading at RMC-1
viii.)	3 Seeps @ RMT-2 (1.76 lbs/day)	05.0% of zinc loading at RMC-1
ix.)	Buried Tailings Seep (1.6 lbs/day)	03.6% of zinc loading at RMC-1
- 2) As a result of the State interjecting the three combined seeps at RMT-2 as the eighth major point source contributing zinc to the system, please revise the Idarado proposed 2013 field investigations to include monitoring the three combined seeps and piezometers at RMT-2 with the other eight sources identified.
- 3) As the non-point-source zinc contribution from RMT-2 is not clear, please revise the Idarado proposed 2013 field investigations to include monitoring to bracket RMT2 with the (now) nine point sources identified.
- 4) As mentioned in earlier Sections of the State's review, please include sampling and evaluation of Governor Gulch, Galena Lion Gulch, McIntyre Gulch, Monument Gulch and any draining mines located on the west side of the valley if a new mass balance sampling effort is conducted.
- 5) Implementation of the Weepline at the Treasury Tunnel has proven to be ineffective in part due to a limited wetland area in which the mine drainage infiltrates. The saturation of the ground has caused portions of the flow to emerge from the wetland in preferential pathways that flow overland into Red Mountain Creek. In 1997, Idarado proposed to the State an interim plan to pump approximately 60 – 80 gallons per minute of Treasury Tunnel water to the Meldrum Tunnel, which discharges into the San Miguel River Watershed. Idarado indicated that they will submit plans for the expansion of the Treasury infiltration system as soon as these plans are finalized. Please include treatment of the full flow from the Treasury Tunnel when evaluating remedial measures.
- 6) The State will need to consider the effect on San Miguel River water quality without contribution of Treasury Tunnel Pump back flows.

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- 7) Implementation of the Weepline at the Genessee Mine has also proven to be ineffective in part due to precipitation of iron and resultant occlusion of the perforations in the pipe and interstitial spaces in the down-gradient soils. The occlusion of the pipe and ground has caused the portions of the flow to emerge from the pipe in preferential pathways that flow overland into Red Mountain Creek.

The *Evaluation Report* proposes that Idarado will “perform a reconnaissance survey to identify if an area is more favorable for infiltrating the water from the Genessee Adit drainage into natural ground, conduct infiltration testing and obtain necessary design information.” Considering the ineffectiveness of the existing design, please consider designs to minimize iron precipitation in the pipe and down-gradient soils.

- 8) The *Evaluation Report* indicates that the Genessee Mine drainage contributes approximately 67% of the zinc loading at RMC-1. At the limited flow rate of 17 gpm, the Treasury Tunnel mine drainage contributes approximately 12.4% of the zinc loading at RMC-1. The buried tailings seep contributes 3.6%, and the Barstow and RMT2 seeps combined, contribute approximately 6.8% of the zinc loading to RMC-1.

In addition to the remedial measures proposed in the *Evaluation Report*, the State requests that Idarado consider the active treatment of mine drainage at the Guston and the Idarado-owned properties, i.e., (consolidation of) the Treasury Tunnel Drainage, and seeps located at the Buried tailings, Barstow and RMT -2.

Please contact me if you have any questions or need for clarification. I can be reached at: (970) 708-7188 or at P.O. Box 2927, Telluride, Colorado 81435, or at [Camille.price@state.co.us](mailto:Camille.price@state.co.us).

Sincerely,



Camille Price  
Project Manager

cc: Doug Jamison, CDPHE-HMWMD  
Jason King, Attorney General's Office  
Julio Madrid, Battle Mountain Resources, Inc.  
Sherm Worthington, Worthington Miller Environmental, LLC

Idarado File: 10.2.3 Volume 8 - Compliance Monitoring- Red Mountain Water Quality