



**COLORADO**  
Division of Reclamation,  
Mining and Safety  
Department of Natural Resources

June 18, 2021

Brian Briggs  
Ouray Silver Mines, Inc.  
PO Box 564  
Ouray, CO 81427

**RE: Revenue Mine, Permit No. M-2012-032, Technical Revision (TR-14), Adequacy Review-3**

Dear Mr. Briggs:

The Division of Reclamation, Mining and Safety (Division) is in the process of reviewing the above referenced Technical Revision in order to ensure that it adequately satisfies the requirements of the Colorado Mined Land Reclamation Act (Act) and the associated Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations (Rules). During the review of the material submitted, the Division determined that the following issue(s) of concern need to be adequately addressed before the Technical Revision can be considered for approval. Please address the following:

1. The Division is amenable to allowing alternative chemicals so long as they are comparable. The Division will allow up to two alternatives (three total chemicals to be used interchangeably). If in the future, a different chemical type or comparable alternative is needed, a Technical Revision shall first be submitted and approved prior to switching.
2. Attached is the Division's table 1 summarizing the chemicals proposed to date. If the manufacturer name is in red, the MSDS has not been provided to the Division, please see question XXXX. In the case where more than 3 alternatives have been provided please indicate which manufacturer will be your second and third choices. Similarly other manufacturers were proposed in early submissions but not mentioned in Adequacy Response #2 Table 4. Update/complete this table.
3. Several new chemicals have been proposed within Adequacy Response #2. MSDS' need to be provided for any and all chemicals in which OSMI proposes to house within the reagent room.
  - a. Update tables accordingly. Include new/alternatives throughout all documents.
  - b. Once MSDS for primary and alternatives are received, the Division will verify that the proposed alternatives are comparable and have similar environmental and health risks.
4. Nax 31 by Prospec Chemicals appears to be an alternative Sodium Isopropyl Xanthate. Please confirm if this is an alternative requesting to be used.



5. Danafloat 067 by Quadra Chemicals Inc. appears to be a new chemical rather than an alternative based on the provided MSDS section 3. Composition/information of ingredients. Please clarify;
  - a. What this chemical is used is for/purpose;
  - b. Where it will be stored within the reagent room;
  - c. Indicate if it will be replacing another chemical or if additional tanks are needed,
  - d. The maximum volume to be stored on site at any given time;
  - e. Its known potential to affect human health, property or the environment, pursuant to Rule 6.4.21(5)(a);
  - f. The expected concentrations, process solution volumes and fate of designated chemicals, in accordance with Rule 6.4.21(5)(b).
6. Polyfroth W20 by Quadra Chemicals Inc. appears to be a new chemical rather than an alternative based on the provided MSDS section 3. Composition/information of ingredients. Please clarify;
  - a. What this chemical is used is for/purpose;
  - b. Where it will be stored within the reagent room;
  - c. Indicate if it will be replacing another chemical or if additional tanks are needed,
  - d. The maximum volume to be stored on site at any given time;
  - e. Its known potential to affect human health, property or the environment, in accordance with Rule 6.4.21(5)(a);
  - f. The expected concentrations, process solution volumes and fate of designated chemicals, pursuant to Rule 6.4.21(5)(b).
7. Based on response to question XXX if new chemicals are being proposed, update the Emergency Response Plan and Materials Containment Plan to include these chemicals. The Material Containment Plan and Emergency Response Plan should include all primary and alternative chemicals to be used. Include the manufacturer name, physical state, storage location(s) and maximum volume to be stored on site within both plans.
8. In the case of an emergency are tanks available on site to collect liquid materials and store them on site until characterization comes back to determine disposal methods?
9. With regards to table 6 and reagent dosing. Please provide a more detailed explanation of Table 6. What are the estimated dosing units (volume) of reagent(s) to be added per short ton (st/ton) of ore to be processed?
10. Regarding chemical tracking. While this information is understood to be available at the Mine Office as part of normal business, the requested information should be submitted to the Division as a quarterly Milling Report to verify the amounts of Designated Chemicals used, and stored on site. This information is used to verify the sufficiency of containment volumes, volumes of chemicals used and accurate representation of what chemicals are on site from an Emergency Response standpoint.

- a. Please commit to submitting a Quarterly Milling Report that includes tons of ore processed, volumes of chemicals used to process the ore and a balance sheet describing what chemicals have been shipped to the site, consumed during milling operations and containers or chemicals disposed of. Said report will be due within 30 days of the end of the previous quarter.
    - i. Q1 (January 1 to March 31) is due by April 30;
    - ii. Q2 (April 1 to June 30) is due by July 30;
    - iii. Q3 (July 1 to September 30) is due by October 30;
    - iv. Q4 (October 1 to December 31) is due by January 30.
11. At this time the Division is not certifying the mill for storage of additional reagent chemicals. Chemicals to be located within the mill shall be for short-term temporary storage during times of maintenance or housekeeping within the reagent room.
  - a. No more than two different reagents shall be stored within the mill at any given time;
  - b. The total volume of reagents stored in the mill building shall go towards the site total maximums to be stored on site.
12. Is the common area sump temporary/portable? Will piping to take material sumped be temporary or permanent? In addition, where will the sump used in the common area report to?
13. What method would be employed to drain the piping if the proper mill shut down was not conducted and mixed reagents remained?
14. Two different Sherwin Williams epoxy product information sheets were provided within Adequacy Response 2. Both of which are different from the Sherwin Williams epoxy that was submitted in adequacy response #1. Which epoxy will be used?
  - a. FastStop SL-23: No wait time for concrete to cure between applying this epoxy specified, provide information. No details regarding repairs were provided. The repair detail included in the response was specific to Dura-plate 8200. What are the details specific to this product?
  - b. Dura-plate 8200: This product requires concrete to cure 28 days @ 75F prior to application. What's the anticipated wait time given the specific site conditions? No rating against chemicals was provided, please include more information.
15. Is there any way to evaluate when the barrier (epoxy) needs replaced other than apparent spots of damage? Provide any sort of maintenance schedule or inspections to ensure it remains impermeable?
16. It is understood that all piping will be pressure tested after assembly, however a portion of that piping leaves the reagent room and enters the Mill, please clarify if the reagent piping will be pressure tested separately or if the pressure test will be performed when the piping is connected to the applicable pipes in the Mill and the greater Mill Reagent piping system will be tested as one unit.

17. The QA/QC table is somewhat abbreviated, but sufficient. The Division does not have access to the ASME database so the benchmarks need to be explicitly stated. This along with the supporting documentation of the tests performed will make tracking of the tests easier. Provide the Division with the referenced ASME standard.
  - a. In response 3(a)(i) of Adequacy Response #2 ASME Standard B31 and AWS D1.1 were referenced. Please explicitly state those standards.
18. During the submittal of the as-built certifications of the reagent room, in the final overall drawings of the building please identify the location of the septic tank leach field.
19. Commit to storing containers in secondary containment for those where containers containing spilled chemicals that are to be returned to the manufacturer or awaiting results of hazardous waste determination testing be stored while waiting for off-site transport pursuant to Rule 6.4.21(6)(b)(i).
20. With regards to disposal of empty chemical containers. The Division has contacted CDPHE to verify OSMI's interpretation of Colorado Hazardous Waste Regulations (6 CCR 1007-3, Section 261.7). CDPHE has confirmed that with regards to chemicals used for the purposes of beneficiation for mining that a container is considered 'empty' if it contains less than 10% by volume and it may be disposed of as solid waste. It is noted that the solid waste disposal facility may still choose to reject the waste which would then require the containers to be taken to another permitted facility. In reviewing the proposed reagent list provided thus far with CDPHE, they did state that extreme precaution should be taken to ensure that containers are as empty as possible since several of the chemicals are either flammable or reactive.

Further guidance from CDPHE included:

- a. All chemicals (pure or mixed), process water, sludges (tailings) or other solid waste generated from the milling process will require a hazardous waste determination prior to disposal. TCLP testing should be conducted on all wastes.
- b. Any materials that fail TCLP testing will be required to be disposed of as hazardous waste.
- c. Material with a pH less than 2 or greater than 12.5 that pass TCLP testing is eligible to have its pH adjusted to allow for non-hazardous waste disposal (subject to facility acceptance).
- d. Although it is non-jurisdictional for the Division, please ensure compliance, where necessary, with SARA Title III Program with the Colorado Department of Health and Environment for reagents stored within the DRMS Permit Boundary and at the offsite storage location at OSMI's warehouse.

Please note that many of the waste streams cannot be accurately determined until completion of mill commissioning and wet testing. That being said concerns regarding disposal of chemicals (pure or mixed), process water, sludges (tailings) or other solid

waste generated from the milling process will be addressed under TR-15 (Mill Certification).

21. For the list of independent reviewers proposed, the Division approves the possible use of the provided independent reviewers. If an independent reviewer is to be used in lieu of a Division inspection, please provide notice to the Division prior to the inspection identifying which company is to be used, and what items will be inspected. Documentation of the inspection and QA/QC verifications performed by the independent reviewer shall be submitted to the Division after the inspection is complete.

The current Decision Date is set for Wednesday June 23, 2021. Please submit your responses to the above listed issues by Monday, June 21, 2021 in order to allow the Division sufficient time for review. If you cannot address the above issues by June 21, 2021 please request an extension to the decision due date to ensure adequate time for the Division to review materials. If any adequacy issues remain by the decision due date the Division may deny the Technical Revision.

The Division will continue to review your Technical Revision and will contact you if additional information is needed. If you require additional information, or have questions or concerns, please feel free to contact me.

Sincerely,



**Lucas West**

Environmental Protection Specialist  
Division of Reclamation, Mining and Safety

Enclosures: Divisions Table 1

Cc: Travis Marshall, Senior EPS, DRMS  
Amy Yeldell, DRMS

Ec: Brian Briggs, OSMI  
Brianna Greer, OSMI  
Todd Jesse, OSMI

Division’s Table 1

| Chemical Name<br>(Synonyms/ Trade name)                           | Use                                          | Manufacturer 1 & MSDS | Manufacturer 2 & MSDS          | Manufacture 3 & MSDS | Other                                                                                                                                                                                                     |
|-------------------------------------------------------------------|----------------------------------------------|-----------------------|--------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aerofloat 242 Promoter                                            | Promoter-AG                                  | Cytec Industries      | Solvay                         | -                    | -                                                                                                                                                                                                         |
| Aerophine 3418 Promoter                                           | Flotation-Cu & Pb                            | Cytec Industries      | Solvay                         | -                    | -                                                                                                                                                                                                         |
| Copper Sulfate<br>Pentahydrate<br>(CuSO4)<br>(Cupric Sulphate B)  | Floatation-Zn                                | Quadra                | Milopore Sigma (Sigma-Aldrich) | Lab Chem             | Old Bridge Chemicals MSDS provided under initial request and Adequacy response #1                                                                                                                         |
| Hyperfloc AF 309                                                  | Settling                                     | SNF, Inc.             | Hychem, Inc.                   | -                    | -                                                                                                                                                                                                         |
| Hydrated Lime                                                     | PH Adjuster                                  | Lhoist North America  | Chemical Lime Co.              | Graymont Inc.        | Bentag Pacific MSDS provided under initial request                                                                                                                                                        |
| Oreprep F-549 Frother                                             | Frother                                      | Cytec Industries      | Solvay                         | -                    | -                                                                                                                                                                                                         |
| Sodium Isopropyl Xanthate<br>(NAX 31)<br>(Flottec SIPX Collector) | Flotation                                    | Prospect Chemicals    | -                              | -                    | Charles Tennant & Company MSDS provided under Adequacy Response 1<br><br>Additional chemical manufacturers proposed in Adequacy response 2.<br>-Quadra Chemicals,<br>-Flomin, Inc., and<br>-Sigma-Aldrich |
| Sodium Metabisulfite<br>(MBS)                                     | PH Control,<br>Flotation<br>prevention of Cu | Quadra Chemicals      | -                              | -                    | Additional chemical manufacturers proposed in Adequacy response 2.<br>-Prospect Chemicals<br>-Fisher Scientific<br>-INEOS Calabrina<br>-ESSECO USA                                                        |
| ZnSO4                                                             | Floatation- Cu,<br>Zn, Pb                    | Zinc Nacional         | -                              | -                    | -Columbus Chemical Industries<br>-Jost Chemical Co.<br>-AquaPhoenix Scientific                                                                                                                            |
| Danafloat                                                         | Floatation ?                                 | Quadra                | Cheminova                      | -                    | -                                                                                                                                                                                                         |