

December 20, 2023

Patrick Lennberg
Colorado Division of Reclamation, Mining, and Safety
1313 Sherman St, Rm 215
Denver, CO 80203

**RE: Gold Hill Mill 110D Conversion Application (M-1994-117, CN-1)
Adequacy Response 3**

Mr. Lennberg

Colorado Milling Company submits the attached response to the CDRMS adequacy questions posed in your October 17, 2023 letter. Each comment or questions is addressed directly, with revised documents referred to as needed. A set of revised exhibits is included to replace the exhibits from the original application in order to maintain a complete single document for reference.

Upon confirmation of receipt from CDRMS, the Boulder County clerk copy of the DMO conversion application will be updated and a receipt letter will be provided to CDRMS.

Please contact my office with any further questions or comments on this application.

Sincerely,



Ben Langenfeld
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EXHIBIT C –Mining Plan (Rule 6.3.3):

DRMS Follow-up

12b. According to the Water Court Decree 85CW117 the 20 shares of water that can be diverted and used for mining requires the lands historically irrigated by said 20 shares will no longer be irrigated by said shares (Findings of Fact item no. 18 and Adjudged and Decreed item no. 35).

The protection of water rights during a mining operation and during reclamation are within the jurisdiction of the DRMS pursuant to Rule 3.1.6(1)(a) which states “Disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quantity or quality of water in surface and groundwater systems both during and after the mining operation and during reclamation shall be minimized by measures, including, but not limited to:

- (a) compliance with applicable Colorado water laws and regulations governing injury to existing water rights.

The Division is seeking a demonstration that the lands historically irrigated are not being irrigated by the 20 shares of water when the Operator is removing water from Left Hand Creek for mining. This demonstration is required to show that downstream water users and water rights holders are not being injured by the Operator removing water for mining and irrigating.

The operator controls the decreed water right from Left Hand Creek. The operator has no control on the historically irrigated lands in question; any irrigation taking place on that land from Left Hand Creek is either using a different water right or is illegal.

18b. The Sampling Plan still lacks sufficient detail and needs to be revised. There still is no discussion in the sampling plan regarding Quality Assurance and Quality Control (QA/QC) sampling (e.g., rate of collection of duplicate samples, rinsate blanks, and field blanks). Please update the sampling plan to address how QA/QC sampling will be conducted at the site for surface water, groundwater, and soil/sediment sampling. Additionally, the plan needs more detail to ensure that sampling can be completed in an accurate and repeatable manner throughout the life of the permit. Details such what field parameters will be recorded during well purging, purge rate and total volume removed, field filtering of samples, recording of groundwater levels prior to purging, and use of field sheets to record field sampling data on, to be submitted along with sample results, on quarterly basis. As an example please see TR-5 for the Cash & Who Do Mines Comprehensive Water Monitoring Plan.

The sampling plan from the Cash & Who Do Mines has been adopted for use at Gold Hill Mill. See the revised sections of Exhibit C. The standard operating procedures for the Cash Mine sampling plan have replaced the sampling plan components at Gold Hill Mill where appropriate.

Table 1 needs to be updated to clearly state which location is the point-of-compliance well for the site.

MW-1 is marked as the point-of-compliance well in Table 1.

Table 3 needs to be separated into two separate tables, one for groundwater and the other for surface water. Again the regulatory limit the sample result will be compared to needs to be included into each table.

Table 3 has been separated into two tables. The groundwater table lists the applicable regulatory limits. The new Table 4 now contains only the Left Hand Creek parameters for sampling. As Left Hand Creek sampling is for collection of natural creek water quality, there is no water quality standard to compare it to for compliance purposes.

Please note that in addressing this adequacy item, table numbering in Appendix C-2 has been updated.

Will the surface water samples collected from Left Hand Creek be compared to the WQCC Regulation No. 38 – Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin, Stream Segment COSPSV04A Mainstem of Left Hand Creek, including all tributaries and wetlands, from the source to a point immediately below the confluence with James Creek? If not, please clearly list the limit to which the sample results will be compared along with an explanation for the limit.

Left Hand Creek sampling and monitoring is conducted to provide ambient surface water data. This water has not interacted with Gold Hill Mill in anyway, and as such there is no limit to compare it to for compliance purposes. It is baseline data.

Table 4 needs to have the limits for groundwater added for comparison purposes.

Table 3 has been updated to show the applicable groundwater limits from CDPHE in relationship to the wells being monitored.

Please provide a discussion comparing the water levels and water quality results between the monitoring wells and the mine pool (where measurements and results occur at the same time) that provides a demonstration the mine pool is not influencing the groundwater.

Please see the discussion added to Exhibit B, Section 3.3.

The Wynona Shaft will need to be sampled for an expanded suite of analytes. Please propose an expanded analyte list for this location.

An additional table has been added regarding the Wynona Shaft and applicable sampling and includes the expanded suite of parameters.

Objections and Comments:

- 36.** *The Division received a timely objections and comments, in accordance with Rule 1.7.1(2)(b), from The Watershed Center, Stephen Strand, Left Hand Canyon Residences, Town of Gold Hill, Boulder Watershed Collective, Gold Hill Fire Protection District, Boulder Flycasters and St. Vrain chapters of Trout Unlimited, Norman Skarstad, Amy Fotunato, Left Hand Ditch Company, John Daspit, and Pine Brook Water District. Please respond to the objections and comments. Please inform the Division if the Applicant does not have a copy of the comments or objections from the parties listed and they will be resent. Additionally the Division received an untimely letter of objection from the Four Mile Fire Protection District and a letter of support from Rene Murphy.*

Noted.

New Items:

- 48.** *Tables B2-1 and B2-2, the sample results are being compared to the Agricultural Standards from Regulation 41. The tables need to be revised to compare the results to the most restrictive standards found in Regulation 41 Tables 1-4. The histograms need to be updated as needed.*

Table B2-1 and B2-2 and the associated histograms have been updated as requested.

- 49.** *Exhibit C, Section 1.7, Water Consumption, needs to be updated to the dates and rates at which water can be removed from Left Hand Creek as is mentioned in Section 2 Water Rights.*

The requested information has been added to Section 1.7.

- 50.** *Exhibit C, Section 1.8, first paragraph needs to be updated to address the comment made by DWR regarding impounding stormwater.*

Language has been added to Section 1.8 to address DWR comments.

- 51.** *Exhibit C, Section 3, it is stated that ore brought to the Site will be tested only for ABA. However, in Section 4 it is stated that any ore coming onsite will be tested for SPLP and ABA. These two sections need to be revised for consistency. Additionally, in Section 3 it appears to state that ore material may be received by the site regardless of ABA testing but in Section 4 it seems to state that only material meeting a certain criteria (non-toxic and low to non-acid generating) will be accepted. Please clarify. Exhibit U, Section 9, needs to be updated as needed to reflect edits made in this section for consistency.*

The reference in Section 3 has been revised for clarity. Exhibit U, Section 9 has also been revised to be consistent.

- 52.** *Exhibit C, Section 4, the Applicant states that the Division will be notified prior to accepting material from a mine for processing. A description of what will be provided in the notification needs to be clearly stated. At a minimum the Division expects the notification to come in letter form that identifies the mine location, permit number, permittee providing the material, the*

results of the SPLP and ABA testing, quantity of material, and time frame for importing the material. Exhibit U, Section 9, needs to be updated as needed to reflect edits made in this section for consistency.

The list of notification information has been added to Exhibit C, Section 4.

53. Exhibit C, Section 4.3, the second paragraph needs to be updated to include “storage”.

Storage has been added to the requested paragraph.

54. How was the estimate for the remaining TSF capacity performed in January 2022? A review aerial imagery from 2023 indicates the TSF may be at capacity.

TSF capacity was estimated from a site survey conducted in the 2010s. As part of the TSF recertification as an EPF, the capacity of the TSF will be confirmed with a topography survey.

55. Exhibit C, Section 4.3.1, needs to be updated with monitoring well MW-1.

MW-1 has been added to the list in Exhibit C, Section 4.3.1.

56. Exhibit D, Section 1.3.5, why will the uphill diversion ditches be reclaimed?

The uphill diversion ditch will remain following reclamation. Section 1.3.5 has been revised as needed.

57. Appendix C-7, the mine pool elevation graph needs to be updated to include the water level measured in 2022 prior to the brief pump test.

The mine pool elevation measurement from the 2022 pump test has been added to the graph on Appendix C-7. The graph has been revised to more appropriately reflect data gaps.

58. Exhibit D, Section 1.7, this section states that the adit will be left in a condition to allow for drainage. While the Applicant has stated that there will be no acid-mine drainage or need for water treatment the drainage will have to be sampled to demonstrate this is the case. Develop a plan for sampling any mine drainage during reclamation to demonstrate there is no acid-mine drainage or need for water treatment at the site.

Section 1.7.1 has been added to Exhibit D to address natural groundwater discharge sampling at the Times/Wynona Mine adit in reclamation.

59. Exhibit D, Section 1.9, a statement needs to be added to this section clearly indicating the monitoring wells will be plugged and abandoned according to Department of Water Resources 2 CCR 402-2 Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction. The Applicant will have to submit a summary report describing the monitoring well abandonment process along with any relevant DWR documentation.

Requested language has been added to the requisite section.

60. On page U-11 Section 2.3 Froth Floatation, Table U-3 is referenced as containing a list of reagents to be used. However, Table U-3, page U-13, lists tank capacities and Table U-4 on page U-14 lists Chemicals Stored On-Site.

The correct table is now referenced.

61. On page U-12 Section 2.7 Processing Containment Table U-3 is referenced correctly but it appears this table should be re-labeled as Table U-4.

Table labelling has been updated and confirmed for Exhibit U.

62. In 2010 during an inspection the Division noted tailings materials had been deposited outside the TSF through either wind or water erosion. In the Board Order dated April 2012 for MV-2011-033 the Operator at the time was directed to submit a Technical Revision to address reclamation of historic prospecting pits and the transport of tailings from the pond. In January of 2013 TR-8 was submitted and approved to address the historic pits but it did not address transport of tailings from the pond. Please provide a management plan to address the wind and water erosion of the tailings pond beach material away from the pond and potentially contaminating the environment.

See the off-site tailings recovery plan in Exhibit U, Section 2.5.

63. Exhibit U, Section 5, please clarify why a process water discharge permit is required from WQCD.

The SPCC Plan and MCP Plan have different primary points of contact, please clarify who is going to be the primary point of contact and if there are differing contacts please explain why. The documents should be updated as needed.

Exhibit U, Section 5 has been updated to remove the reference to Process Water. It is not anticipated that a process water discharge permit will be needed, only a Stormwater Discharge Permit for the Storage Yard area. Such a permit is secured out of an abundance of caution for the Storage Yard area in case stormwater releases are necessary. The MCP has been corrected to have the same primary contact as the SPCC Plan.

Additional Comments from Lucas West

Please see the responses below regarding Mr. West's comments.

- 1. In your responses to the Division's Additional Adequacy Review- 2 dated July 5, 2023 the commitment was made to address each Environmental Protection Facility (EPF) in separate Technical Revisions for each. The Division is accepting of this commitment, and for clarity will outline the requirements for each Technical Revision (TR) below. Please note that each TR will be subject review and must meet the applicable requirements of Rule 6.4.21, 7.3 and 7.4. All TR's should include maps, schematics and issued for construction drawings were appropriate. The EPF's will not be considered certified for operations until all applicable QA/QC documentation and certified as built have been submitted and accepted by the Division. The requirements include but are not limited to;*

EPF certification minimum requirements have been added to Exhibit U, Section 1.4.1.

Exhibit U- Environmental Protection Plan (EPP) - Rule 6.4.21

Gold Hill Mill will provide technical revisions with the requirements outlined by the Division for each of the identified EPFs prior to any work being performed on them. As outlined in the revised Exhibit U, Section 1.4.1, the TSF will be recertified as part of the of this process. This recertification will include a comprehensive evaluation of the integrity of the liner, the embankment, and confirmation of the capacity of the TSF for both tailings and necessary water storage. To that end, the applicant proposes to address all adequacy items related to these TSF topics in the TSF recertification process. Please Exhibit U, Section 1.4.1 for more information.

- 2. Section 7, Pg. U-16 states that temporary shutdown of the mill will include removal of any Designated Chemicals from the mill. Fore stored bulk chemicals this is considered adequate, however for chemicals already in solution, please provide an estimated volume and concentration of the process water. Additionally please identify the detoxification procedures and water management measures, including disposal of process and wash water in the event of a hard stop or Temporary Cessation pursuant to Rule 6.4.21(6)(a).*

Exhibit U, Section 7 has been revised to include the process water disposal during temporary shutdown, including a volume estimate. This volume estimate will be revised during the EPF certification of the Mill Facility when final equipment for operations is approved.

- 3. In conjunction with Item 1, b, Section 3.1 on Pg. 9 of the Materials Containment Plan suggest reagent unloading will take place outside of a secondary containment structure. Please note that all handling of designated chemicals including unloading should be conducted within a secondary containment facility. As designs have not been completed or submitted, and the commitment to addressing the Chemical Storage EPF through the TR process, please additionally commit to including the design and construction of a secondary containment area specific for the purposes of unloading bulk chemicals in the TR for the Reagent Storage Area.*

A design for the chemical unloading area will be included in the Technical Revision for the Reagent Storage Area EPF design.

Additional Comments from Tim Cazier

Please see the responses below regarding Mr. Cazier's Oct. 17, 2023 comments.

- 1. Stability Model Comparison: As outlined in Appendix C-5, McCulley, Frick & Gilman (MCG) used Xstabl to analyze embankment stability in 1998. Lewicki & Associates (Lewicki) elected to use Galena to re-evaluate slope stability in 2023. There appears to be additional differences in the modeling approach. MCG employed the Janbu method which analyzes block failures, whereas Lewicki used the Bishop method which only looks at circular failures. It's not clear why MCG only investigated block failures. Perhaps the potential failure planes related to the placement of a geogrid, 60-mil HDPE liner, and a GCL layer may have prompted that approach. Regardless, because the GCL and the HDPE liner could both act as slip planes, the internal slope should be evaluated for non-circular failure surfaces, as well as circular failures, given the nature of the embankment materials.*

Both the liner and the GCL were installed at 1.5H:1V slopes and could act as slip planes. The geogrid appears to have been only installed horizontally or on a terraced surface (Drawing No 5461-C-5, Rev. 2, June 1998) and is unlikely to have any negative impact on stability. In fact, MCG states in the "Background" section of the October 9, 1998, technical revision report: "The geogrid was not specifically designed as a reinforcing member in the embankment raise, although some reinforcement benefit is realized." It also appears MCG did not analyze the stability of the external or outslope of the new embankment in 1998, but only the internal slope failures that might impact the liner system. The Lewicki portion of App. C-5 reports they arrived at a Factor of Safety (FoS) of 1.3 using the same strength parameters as MCG's analysis that yielded a FoS of 1.2. This is an eight percent difference. The DRMS does not necessarily concur with Lewicki's assertion that the difference is not significant, especially considering that different failure surface methods were implemented in the two different models. It should be noted that Galena can also be used to employ the Spencer-Wright method, which allows both circular and non-circular methods to be used in the analyses of slope stability. As a re-evaluation exercise, the DRMS requests similar methodology be used for comparison.

Additional slope stability analysis have been conducted as requested.

- a. Please consider using the Spencer-Wright method for non-circular failures in the Galena re-evaluation; or use another model/method that utilizes block failures.*

A Spencer-Wright analysis for non-circular failures was conducted as requested. Its results have been added to Appendix 5.

- b. Both circular and non-circular failure surfaces should be evaluated for internal slope failures.*

With the addition of the Spencer-Wright analysis, both circular and non-circular failure surfaces have been evaluated for the internal slope.

- c. The DRMS concurs only circular failure surfaces need be considered for external slope failures.*

Noted.

2. *Factor of Safety: Section 3, Conclusion indirectly cites the Mined Land Reclamation Board Policy No. 30 (Policy 30) for establishing an acceptable FoS, inferring the static $FoS \geq 1.3$ (pseudo-static $FoS \geq 1.15$) for “critical structures with site specific materials properties” is appropriate. The 1998 McCulley report states “The soil parameters used in the computer model analyses were based, in part, on results of laboratory analyses of representative soil and tailings samples collected from the site and, in part, on conservative estimates from published literature and previous experience with similar materials.” The Lewicki report states these same values were used in the updated analyses. Therefore, as not all parameters are based on site specific material testing, the more conservative Policy 30 criteria are appropriate: $FoS \geq 1.5$ and pseudo-static $FoS \geq 1.3$. It should also be noted that as the tailings impoundment is considered an environmental protection facility (EPF) where a slope failure could lead to offsite impacts, the impoundment itself is considered a critical structure. Before any more material is added to the tailings impoundment, the FoS needs to meet the most conservative criteria of Policy 30, or site-specific material testing data needs to be provided to the DRMS for all seven materials.*

Gold Hill Mill will provide CDRMS with site specific data for the embankment and tailings materials at the TSF as part of the EPF certification process for the TSF.

3. *Pseudo-Static Factor: It appears a pseudo-static earthquake coefficient of 0.05 was used in the Galena models for pseudo-static loading. Please provide rationale for using this value.*

Seismic conditions are modelled using the implementation of a seismic coefficient in the GALENA models. Gold Hill Mill is located within the Zone 1 of the seismic zone map of the United States. On the modified Mercalli scale, this is a V and VI area with a typical seismic coefficient of between 0.03 and 0.07. For the purpose of analysis, the median of 0.05 is used in all pseudo-static analysis.

4. *Decant Pond: On p. 3 of the McCulley report, the second to last sentence states “The impoundment will be maintained such that the decant pond is toward the back of the impoundment.” Based on photos from our August 9, 2018 inspection, it appears water was within 15 feet of the line in the south corner (**Photo 1**). Furthermore, reviewing Google Earth historical imagery suggests water within two feet of the liner in the same area in October of 2013 (**Photo 2**). Please address the following:*
 - a. *Establish a minimum beach width where the normal operating pool level in the tailings impoundment must remain offset from the embankment, and provide rationale for this distance.*
 - b. *Describe how the facility will be brought into compliance with the beach width criteria proposed in Comment 3.a above.*

Gold Hill Mill will provide CDRMS with tailings distribution guidelines, including minimum beach width, as part of the EPF certification process for the TSF.

5. *Water Balance: Water management is critical to the operation of an EPF. DRMS records indicate the tailings impoundment is designed to function with two feet of freeboard (embankment crest height above the normal operating pool). The water level in Photo 1 appears to be very close to two feet from the embankment crest. Assuming no tailings have been placed since the October 2013 Google Earth image (Photo 2), it seems likely there was less than two feet of freeboard at the time. The water balance in Section 5.1 of the conversion submittal is a very simplified calculation based on*

average annual evaporation, sublimation, and precipitation (snow and rain). It is not uncommon for typical monthly evaporation and precipitation values to complicate, or even invalidate a water balance based on average annual values. Furthermore, as the tailings impoundment is an EPF, Rule 7.3.1(3) requires the facility be designed to sufficiently handle the design storm, which for this EFP has been determined to be the 100-year, 24-hour storm. Please address the following:

- a. *Provide the DRMS with a more detailed water balance with a time step of no less than one month. That is to include monthly precipitation, evaporation and other inputs and losses as necessary, including snowmelt (the annual water balance provided indicates the average annual snowfall water equivalent is 38.5 inches, which if it realistically melts in a single month could consume all the 24 inches of freeboard). If the water stored in the impoundment after 12 months is greater than it was under the initial water balance conditions (i.e., if there is a net gain in water storage over 12 months) then a deterministic water balance is insufficient, and a probabilistic approach needs to be implemented. The water balance also needs to demonstrate that the tailings impoundment can also accommodate the aforementioned design storm while maintaining freeboard.*

A detailed water balance will be conducted on the TSF as part of its recertification process. This will take into account the level of tailings and water currently in the TSF, the exact embankment elevation to account for any settling that has occurred and document the applicable maintenance activity that will maintain appropriate freeboard.

An estimated monthly water balance has been added to Exhibit B for the time being.

- b. *How is the available freeboard monitored?*

Available freeboard will be monitored via monthly inspection of the TSF. Operations inspectors will manually measure the distance between the top of fines and the lowest portion of the TSF embankment and record it in the TSF inspection log.

- c. *If the freeboard in the impoundment is observed to be insufficient, what actions are taken to restore the required freeboard?*

In the event that insufficient freeboard is identified in the TSF during operations the discharge of additional tailings will cease, and the TSF will cease operation. As part of the TSF certification as an EPF, available storage below the required freeboard will be documented via survey.

- d. *If water is pumped out of the impoundment, is it treated prior to releasing it? If not, where is the pumped-out water stored?*

Water is not pumped out of the TSF as part of normal operations. The Gold Hill Mill does not discharge process water from the TSF or the mill itself. Any water pumped that may be pumped out of the TSF either will be stored in an approved facility (ex. Frac tanks) or used in the milling process.

There is no discharge of water from the TSF.

6. *Diversion of Unimpacted Runoff: The McCulley report drawing 5461-C5 (As-Built drawing) references a V-notch drainage ditch with 1.5H:1V side slopes. No other pertinent information was found. Pursuant to Rule 7.3.1(3) unimpacted runoff from the design storm needs to be diverted from the tailings impoundment. This diversion channel*

will need to convey the peak flow from the 100-year, 24-hour design storm with sufficient freeboard (the lesser of one foot or half the velocity head $[v^2/2g]$, but an absolute minimum of six inches) and include armoring protection as necessary. The DRMS acknowledges hydraulic analyses provided in Appendix C-1. However, these analyses are for a V-ditch with 1H:1V side slopes and the alignment shown on E-5 Tailings Storage Facility shows the V-ditch all inside what appears to be the Tailings Storage Facility (TSF), whereas 5461-C5 shows the diversion outside the TSF. Please address the following:

- a. Provide a hydrologic analysis estimating the peak flow in the diversion channel resulting from the design storm.*

The hydrologic analysis including the peak flow can be found in Appendix C-1.

- b. Provide a hydraulic analysis of the diversion channel demonstrating it has sufficient capacity (including freeboard) and the necessary scour protection for both the flattest and steepest reaches of the channel. This should address both the steepest and shallowest reaches of the channel.*
- c. If either of the hydraulic criteria in Comment 6.a cannot be achieved by the existing diversion channel, please provide an updated design.*

Appendix C-1 has been revised to include channel analysis for the diversion channel that evaluates depth of flow, velocity of flow, and shows the available freeboard for both the steepest and the shallowest sections of the diversion channel. Velocity in the channel is below 3 ft/sec, which is below the commonly accepted 5 ft/sec for earthen channels to prevent erosion.