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

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Nick Michael
Union Milling Company, LLC
P.O. Box 620490
Littleton, CO 80162-0490

***RE: Leadville Mill, File No. M-1990-057 , 112d-1 Conversion Application Adequacy Review***

Dear Mr. Michael:

The Division of Reclamation, Mining and Safety (Division) is in the process of reviewing the above referenced application 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 review of the material submitted, the Division determined that the following issue(s) of concern shall be adequately addressed before a decision can be rendered.

**Exhibit C- Pre-mining and Mining Plan Map(s) of Affected Lands- Rule 6.4.3**

1. Figure 3-1 was submitted showing all immediately adjoining surface owners of record. The map however does not include all map requirements outlined in Rule 6.2.1. Please revise this map to include all elements pursuant to Rule 6.2.1(2) (a-e). Additionally, please include the proposed Permit Boundary on the revised map.
2. Figure 3-2 indicates the Affected Land but does not clarify if the Affected Lands Boundary is the same as the proposed Permit Boundary of 34 total Acres. Using the narrative and a revised figure 3-2 please clarify if the Affected Lands Boundary is the same as the proposed Permit Boundary. Also in the revised figure, please include all elements required by Rule 6.2.1(2) (a-e).
3. Figure 3-3 accurately displays the topography of the site, however is missing elements required in Rule 6.2.1 as well as the proposed Permit Boundary. Please revise figure 3-2 to include the proposed Permit/Affected Lands Boundary as well as all elements required under Rule 6.2.1(2) (a-e).
4. Figure 3-4, the General Arrangement drawing is not signed by who prepared the figure. Please submit a signed version pursuant to Rule 6.2.1(2) (b).
5. Figure 3-5, Soils and Vegetation does depict soil type bet satellite imagery is not sufficient to show vegetation type as required by Rule 6.4.3(e). Also the map is of insufficient scale and does not contain the required elements. Please submit a revised soils and vegetation map, of larger

scale, showing the soil type, vegetation type, proposed Permit/Affected Lands Boundary and all elements required by Rule 6.2.1(2) (a-e).

*Please ensure any changes made to these figures as required by this review, are carried through all exhibits where the same figure is duplicated. Many of the duplicated figures are missing the same items listed above.

**Exhibit D- Mine Plan (Mill Plan) - Rule 6.4.4**

6. Section 4.1.2, Pg. 4-3 references that chemicals and reagents will be contained within the Mill Building in over pack drums, with Sodium Cyanide being stored in a shipping container adjacent. All designated chemicals used in the extractive metallurgical process will need to be stored in an Environmental Protection Facility (EPF) that possesses adequate secondary containment to contain 110% of the total volume of all materials stored in the area, as well as have separation units for incompatible materials. Please provide a narrative discussing the storage of all chemicals and reagents proposed to be used on site. This facility will adhere to all requirements of Rule 6.4.21 and Rule 7 with engineered designs, incremental inspections during construction and engineering certifications submitted with the as-built package after construction is complete. This information should be submitted in the revised Exhibit U, which is addressed later in this review. Please note that shipping containers are not adequate for any designated chemical storage and sodium cyanide will need to have its own separate storage EPF with all the same requirements.
7. The list of proposed upgrades on pg. 4-2 appears to be missing several items including but not limited to the tailings delivery line from the mill to the Filtered Tailings Deposit (FTD), thickener system, containment conveyances, ore storage structure, new secondary containment structures, etc. Please revise this list to include all proposed upgrades or additions that are not yet constructed and be sure each item on the list is thoroughly discussed in the applicable narrative section.
8. On Pg. 4-5, Section 4.3.2 the process flow sheets are referenced. Within these drawings, several features are indicated that are not discussed in the narrative. For example the ore stockpile structure, secondary containment structure for the lime storage, secondary containment for the leach circuit and several sumps within the system. Please provide a more detailed narrative discussing every portion of the process, supported by drawings where necessary. This narrative should include all sumps, lines, containment structures, equipment and should be supported by a General Arrangement Drawing or Drawings to show the details as they exist within the mill building pursuant to Rule 6.3.3(2)(a). Please note that the mill building, ore storage structure and leach circuit containment structure will be considered EPF's and must be included in the revised Exhibit U.
9. In general the discussion on each stage of processing needs more detail. Please provide and in depth narrative discussing the details of **each** stage of processing including the refinery and cyanide detoxification processes. The tables containing performance criteria or equipment are irrelevant and should be omitted. The narrative shall provide a detailed description of all tanks, equipment, and sizing at each stage of crushing and grinding, much more information regarding

the leach circuit, reagent dosing, storage, mixing, as well as process water recycle flows, tailings generation and slurry management.

10. The crushing circuit section on Pg. 4-6, as well as maps and figures throughout the application indicate the construction of new crusher building with equipment and conveyors, however this is not addressed in the narrative. Please provide a detailed narrative, supported by drawings, showing the details of the new crusher building. Please also clarify if the crusher circuit is a dry circuit, if water is introduced in the crusher building to generate a slurry, EPF requirements including containment structures will apply.
11. Table 4-5 on Pg. 4-9 depicts the process material balance. Please add a row to this table depicting the total volume, in gallons, of material ensuring all mixing, storage and day tanks as well as lines are accounted for within the system at any given time. Please also provide the containment capacity to demonstrate adequate secondary containment of the process.
12. Section 4.3.4 briefly discusses laboratory operations within the mill building. Please provide a more detailed narrative discussing the laboratory function, equipment, any chemical storage and usage. Please also ensure the laboratory is depicted in the mill drawings requested in tem 7 of this review.
13. Section 4.3.5 contains various information about reagents. Please provide a detailed narrative discussing the use and purpose of each reagent including details of storage, mixing, dosing and delivery into the mill system. This narrative should also reflect the updated secondary containment information as required by this review pursuant to Rule 6.3.3(2) (a). Additionally, please provide a summary table showing all reagents by chemical name, trade or other names, use, type (I.e. dry or liquid), CAS number, human health hazards, environmental impacts, PPE required, NFPA Classifications, corrosiveness, pH and incompatible materials. This table will be cross referenced with the provided SDS sheets. Please note that the table and SDS sheets need to be specific to the chemical used, not generic.
14. On Pg. 4-12, Section 4.3.6 spill containment for the mill building and other features via the mill sump and Emergency Containment Structure (ECS) are discussed. However the conveyance system going from the mill to the ECS is not mentioned nor are volumetric demonstrations provided for the mill sump. Please provide a detailed narrative supported by drawings and volumetric demonstrations of containment for all containment systems within the mill building, the conveyance system between the mill and the ECS. The narrative should demonstrate adequate drainage within the mill directed to the sump, please also indicate if and now the floor of the mill building will be coated and or sealed for chemical protection. The designs of the conveyance will need to take winter conditions into consideration. All elements of this system will be considered EPF's and addressed in the revised Exhibit U.
15. The leach tank subsection of solution management suggests a spill containment structure for the leach tanks being outside of the mill building and open air. Please provide a more detailed narrative, supported by drawings, on the secondary containment structure, including volumetric demonstrations mentioned in item 14 of this review and conveyance to the ECS. Please note this structure will be considered an EPF and must be addressed in the revised Exhibit U. Also, if

the containment structure is to be open air, designs and management plan will need to accommodate direct fall precipitation as well as winter conditions.

16. In recent discussion a connection to domestic water for use in the mill has been mentioned, however makeup water storage in the ECS is still mentioned in Section 4.4.2. Please clarify if the ECS is still being proposed for makeup water storage for use in the mill. If so please provide a narrative discussing how water will be delivered to the site for use. Please note that the ECS is considered an EPF including an engineer certified as-built package and will need to be addressed in the revised Exhibits G and U.
17. Section 4.4.2, Pg. 4-15 also states that in the event of failure causing cyanide solution to report to the ECS, dilution is the first mitigation step, then the affected water/slurry will be pumped into the cyanide detox circuit. Please provide a more detailed narrative describing this process, including sampling and handling precautions that will be employed. Please also include information on how the contaminated water will be pumped to the detox circuit and what secondary containment and or precautions will be used to accomplish this pursuant to Rule 6.3.3(2) (a).
18. In addition to item 11 requesting a revised Table 4-5, please provide a revised Table 4-12 to show the maximum volume, in gallons, of material within the system compared to each level of containment including all containment structures, sumps and conveyances as well as the ECS.
19. Section 4.5 on Pg. 4-17 references the FTD however contains mostly references to appendix 4-2 and very little information. Pursuant to Rule 6.3.3 (2) (b) please provide a detailed narrative that will be supported by Appendix 4-2 discussing **all** details of the FTD including delivery, dewatering, holding and placement, etc. The narrative should address **all** portions of Rule 6.3.3(2)(b) as well as discuss tailings delivery from the mill to the FTD, secondary containment of that system, sampling of the tails to ensure the cyanide has been detoxified in great detail.

**Appendix 4-1 – Process Flow Diagrams**

20. Drawing F-3 of Appendix 4-1 shows a holding tank in the leach circuit with an agitator existing outside of the containment pad. Please note that all tanks, pipes or other devices used to hold or transport slurry containing cyanide solution must have adequate secondary containment. Please be sure to address this in the revised narrative section as well as update this drawing.
21. Drawing F-7 of appendix 4-1 depicts the use of various mixing and day tanks. Please ensure the narrative requested above in this review discusses these tanks, and ensures proper secondary containment.

**Appendix 4-2 - Filtered Tailings Deposit Management Plan**

22. In conjunction with item 19 of this review, please revise section 2.0 of Appendix 4-2 to address how the tailings slurry is delivered from the mill to the FTD as well as sampling protocols for cyanide levels in the tailings. As noted before, the FTD including filter building, catchment pond, internal drainage ditches and upland diversion ditches will be considered EPFs and must be addressed in the revised Exhibit U.

23. Additionally, the Toxicity Characteristic Leaching Procedure (TCLP) and Resource Conservation and Recovery Act (RCRA) results for the tails is included in Appendix 4-2. Please provide the actual analytical results from the lab to verify these tables. Also, no Synthetic Precipitate Leachate Procedure (SPLP) and Acid Base Accounting (ABA) results were included in the information, please provide the results of those tests for review. If the SPLP and ABA tests have not been conducted, please conduct those tests and provide those results to the Division.
24. Section 2.1, Pg. 2-2 states that tailings can only be accepted by the surface crew in charge of removing and placing the tails in the embankment when the tails are between 13.0 and 18.5% moisture content. However, Section 2.0 on Pg. 2-1 cites a 20-25% moisture content being acceptable. Please clarify the moisture content of the tails and correct the discrepancy. Additionally please make sure the accurate number is carried through to all applicable narratives in all other exhibits as well as any applicable appendices.
25. Additionally, table 2-2 nor the narrative specifies where the samples were taken from. Section 5, Pg. 5-1 of Exhibit E states that the historic tailings pile located on site and three Run of Mine (RoM) stockpiles will be processed first, within 60 days of startup, however the main feed for the mill will be the Penn Mine, Permit No. M-2021-032. Also, Pg. 5-1 states material will be analyzed, suggesting that table 2-2 of Appendix 4-2 does not represent the various materials stored on site. Please demonstrate where the samples depicted in Table 2-2 were taken from, and for all material proposed to be run through the mill, please sample, bench test the milling process, perform at a minimum SPLP and ABA, and report the results to the Division to ensure tailings chemistry and physical properties will not drastically change with differing material.
26. Recent discussions indicate that tailings may be proposed to be disposed of offsite. The Division infers this to mean the FTD will not be constructed. If so please provide details of the proposed off-site disposal including all locations, agreements and documentation of regulatory authority. Please also update all applicable sections to reflect this change as well details of tailings management for offsite disposal. If this is not the case, please clarify that the FTD will be the primary method to tailings disposal, and the technical review of Annex 4 of Appendix 4-2 will proceed.

**Exhibit E- Reclamation Plan – Rule 6.4.4**

27. Section 5.4.5 references that the ECS and FTD will be graded to design criteria and design specifications. While some of those details are included in other appendices, please provide a detailed narrative in this Exhibit discussing the details of the reclamation of these features. Details should include volumes of material to be graded to achieve the post reclamation grade, Top soil storage location, haul distance, placement thickness and revegetation information. For the FTD, please also provide the final slope configuration and a summary of the geotechnical findings.
28. Details on Pg. 5-6 of Section 5.4.5 discuss the inert fill material. Please note that the inert fill section of Rule 3.1.5(a) and the affidavit required is for structural fill material generated outside the DRMS Permit Area. Please clarify if importing inter fill material for the purposes of backfilling is proposed.

29. Pg. 5-7 discusses the general reclamation of the ECS however not sufficiently detailed. Please provide a more detailed narrative, in conjunction with item 27 of this review, discussing the ECS and engineered ditch reclamation including how the liner will be deconstructed, what equipment will be needed, will concrete and other fill material be placed prior to liner deconstruction. Also include details in the event that the three RoM stockpiles and historic tailings material are to be placed in the ECS prior to backfill, volume of material to be moved in Cubic Yards, push distance, equipment size, etc.

30. Section 5.5. on Pg. 5-9 states that 1,775 Cubic Yards of topsoil is stockpiled on site for placement on the EXS, and 4,750-7,200 Cubic Yards will be required for placement on the FTD. Please provide a demonstration that the topsoil stockpile and stockpile to be reserved during construction will be sufficient to achieve reclamation as specified. In the event of a deficit please identify an alternative source and price to obtain the material if necessary.

31. In general, the reclamation task descriptions of Section 5.6 on Pgs. 5-10 through 5-12 are not of sufficient detail regardless of support by appendices. Please provide a detailed narrative for each reclamation task, the narrative should include but is not limited to;

    a. **Task 10-** What is the cumulative volume of the RoM material and historic tailings located on site proposed to be placed in the ECS if not processed; all items previously identified in this review; by placing other fill material into the ECS an excess of backfill material will be created, please identify the volume, final destination and reclamation of that excess; what is the approximate volume of the liner when deconstructed, silt fence, straw wattles and other items that will be disposed of?

    b. **Task 40 –** Please outline the equipment to be removed from the buildings; specify and special equipment needed or task operations required to complete this task; discuss decontamination of equipment, lines tanks, etc. including process/wash water management; in the event of off-site disposal please identify the disposal site; give details of leach pad demolition including volume of material, equipment used, haul/push distance to its disposal location; this task discusses scales not identified in any other maps or exhibits, please give dimensions and final destination of the scales upon reclamation as well as update all applicable maps and exhibits of this application in regards to scales; give linear feet of water/slurry lines to be removed and their final destination; give more information regarding hard stop procedures and reclamation changes associated with that possibility.

    c. **Task 50 –** The narrative states testing and pumping of fresh water and table 5-5 states pump and treat of up to 300,000 gallons to be disposed of into the sewer however maps suggest that the site utilizes a septic system. Please clarify details of sampling, treatment if necessary and demonstration of the septic tanks ability to handle the possible 300,000 gallons of water. The event of contamination of alternative disposal plan, please provide details regarding offsite disposal of the water; also include topsoil replacement and revegetation details.

d. **Task 60 –** Please provide much more details regarding the FTD, catchment pond and both internal drainage and upland diversion ditch reclamation

e. **Task 70 –** Unless identified as a post reclamation feature, simple capping of the monitoring wells is insufficient. The wells will need to be properly plugged and abandoned, please provide details including well diameter, depth, chosen plugging material and surface reclamation measures. Alternatively please clarify if the monitoring wells are to remain post reclamation.

f. **Task 80 –** details regarding chemical disposal is severely deficient. Please provide an estimated quantity of each chemical that will need to disposed of, identify the hazardous material disposal site, decontamination of equipment and wash water handling, testing and disposal, etc. Please note that the Division does not bond for returning chemicals to the manufacturer, bonding will be based on the assumption of proper disposal in a hazardous waste disposal facility for a chemicals on hand.

**Exhibit F - Reclamation Plan Maps – Rule 6.4.6**

32. While Map 6-1 Reclamation Cost Key Map is useful, please provide a final reclamation plan map showing the final reclamation contours **only** the structures proposed to remain post reclamation, pursuant to Rule 6.4.6 (a) and (b).

33. All maps and figures included in Exhibit F are not signed. Please provide signed maps pursuant to Rule 6.2.1 (2) (b).

34. Based on the items of this review, and changes made in response to, if a change to the reclamation plan map(s) is warranted, please revise the maps accordingly.

**Exhibit G – Water Information – Rule 6.4.7**

35. Section 7 as well as its appendices do not adequately address all requirements of Rule 6.4.7, specifically 6.4.7(1) and the sufficient demonstration that the operation is not expected to directly affect surface or groundwater systems. Also, mitigation measures are not adequately addressed in this section. Please revise the exhibit, containing all necessary information to address all requirements of Rule 6.4.7. The information in the exhibit may be supplemented by appendices, but should not contain just references to such.

**Exhibit H – Wildlife Information – Rule 6.4.8**

36. Section 8 references consultation with Colorado Parks and Wildlife (CPW), however the included correspondence is dated July 1, 2011. Additionally, CPW submitted timely comments during the Public Comment Period and provided additional recommendations. Please revise section 8 to address the updated recommendations made by CPW. The division also recommends further consultation with the author of the comments to provide more details. If CPW is consulted in revising this exhibit please provide documentation of such.

**Exhibit J – Vegetation Information – Rule 6.4.10**

37. Section 10 of the application does not adequately address the requirements of Rule 6.4.10, specifically, it does not include quantitative estimates of cover and height of the principal species nor does it address the relationship between soil and vegetation type. Please revise this section to address the requirements of Rule 6.4.10. Additionally, figure 3-5 is referenced, however figure 3-5 contains soil information and no information regarding vegetation. In conjunction with Item 5 of this review, please revise figure 3-5 to show the required information.

**Exhibit K – Climate – Rule 6.4.11**

38. Section 11 provides the annual climate information of the site, however pursuant to Rule 6.4.21(13) (b), 5 years of data is required. Please revise section 11 to address the requirements of Rule 6.4.11 and Rule 6.4.21(13) (b). Please note that much of the same information will need to be included in Exhibit U in addition to the other requirements of Rule 6.4.21(13).

**Exhibit L – Reclamation Costs – Rule 6.4.11**

39. Based on the details requested in this review, specifically item 31 as well as others, please revise the reclamation cost estimate to include all information need to perform an accurate Reclamation Cost Estimate.

**Exhibit M- Other Permits and Licenses**

40. For all permits listed that have not been approved and copies provided to the Division, please provide copies of the approved permits when they are received. Please note that the Division can recommend a decision on this application prior to other agency permit approvals however activity at the site cannot commence until all necessary permits are approved.

**Exhibit Q – Proof of Mailing Notices to Board of County Commissioners and Conservation District – Rule 6.4.17**

41. For the notices included in Appendix 17-1 and 17-2 please provide the Certified Mail Receipts confirming delivery of the notices.

**Exhibit S- Permanent Man-made Structures- Rule 6.4.19**

42. Section 19 references Figure 19-1 to show all permanent man-made structures within 200 feet of the Affected Lands. Please also provide a list of structures that fall within the 200 foot buffer shown on Figure 19-1. Please note that structures includes utilities, roads, fences, etc.

43. Appendix 19-3 contains blank copies of the structure agreements that were presumable sent to each structure owner however no proof of mailing was provided. Please provide documentation of mailing such as Certified Mailing cards. Once proof of mailing has been provided, if no agreement was returned, an engineering report pursuant to Rule 6.4.19(6) will suffice. Please provide engineering reports where executed agreements cannot be reached.

**Exhibit U – Environmental Protection Plan- Rule 6.4.21**

44. Section 21 of the application and its appendecies fail to address all requirements of Rule 6.4.21, specifically details regarding ground and surface water protection, evaluation, design,

construction and certification of **all** Environmental Protection Facilities. In conjunction with all items in this review please revise and resubmit section 21 and its appendices. Please note that details required by Rule should be in the exhibit, not referenced to an appendix. Also for all EPF's please also address the requirements of Rule 7.3 and 7.4.

**Other**

45. For the Emergency Response Plan and Cyanide Emergency Response Plan please revise these sections as requested information in this review will require updating of these plans. The Division also recommends the submittal of a Materials Containment Plan detailing handling, cleanup and responses to various types of spills, etc.

Please submit your response(s) to the above listed issue(s) by Monday, July 24, 2023 in order to allow the Division sufficient time for review. The Division will continue to review your application and will contact you if additional information is needed. Please note that the current Decision Date for your application is set at Monday July 31, 2023. If more time is required to respond to the above listed issues, please submit a Decision Date Extension Request, in writing to the Division's Denver Office. If an Extension Request or responses are not received by the Division by July 31, 2023 your application may be denied.

If you require additional information, or have questions or concerns, please contact me. Direct contact can be made at the Division's Grand Junction Field Office, by phone at 303-866-3567 ext. 8187 or by email at lucas.west@state.co.us.

Sincerely,

**Lucas West**
Environmental Protection Specialist
Division of Reclamation, Mining and Safety

Cc: Travis Marshall, DRMS

Ec: Nick Michael, Union Milling Company, LLC
Gary Knippa, Union Milling Company, LLC
Steve Craig, Union Milling Company, LLC
All interested parties