

March 25, 2022

Daniel Takami
Grand Island Resources, LLC
12567 West Cedar Dr
Lakewood, CO 80228

RE: Cross Gold Mine, Permit No. M-1977-410, Technical Revision No. 10 (TR-10), Preliminary Adequacy Review

Mr. Takami:

On February 28, 2022, the Division of Reclamation, Mining and Safety (Division) received your Technical Revision application (TR-10) to address corrective action #1 of the Mined Land Reclamation Board (Board) Order that was issued on February 18, 2022 for Violation No. MV-2021-017.

After reviewing the materials submitted, the Division has identified the following adequacy item(s) that must be addressed before an approval of TR-10 can be issued:

- 1) Per the Board Order, the purpose of this revision shall be to modify the water management and treatment program for the site to sufficiently address all water quality issues, and to provide a surface water and groundwater monitoring program that meets all applicable requirements of Rules 3.1.6, 3.1.7, 6.3.3, and 6.3.4. The description of this revision provided on the cover sheet does not clearly state this purpose. To make it clear that this revision was submitted to address corrective action #1 of the Board Order, please modify the description provided on the cover sheet to match the language from the Board Order.
- 2) On page 2, under section 1, the operator describes the purpose of this revision as being a “response to a Service of Notice of Violation/Cease and Desist Order (Number IO-211130-1) from Colorado Department of Public Health and Environment (CDPHE) dated November 30, 2021 in conjunction with Permit No. M-1977-410”. This description does not refer to the Order issued by the Mined Land Reclamation Board (Board) on February 18, 2022 for Violation No. MV-2021-017, in which, submittal of this revision is a required corrective action. Please modify the language in this section to clarify that TR-10 is being submitted to address corrective action #1 of the Board Order issued for Violation MV-2021-017.
- 3) The Division has the following comments pertaining to Figure 1 – Water Management System:
 - a. Please add the approved permit boundary (at least the portions visible in the view shown).
 - b. Please show the location of the permitted outfall on Coon Track Creek.



- c. Please include arrows on the pipelines indicating the flow direction.
 - d. Please differentiate the pipelines recently installed to support the new water treatment system.
 - e. Please clarify whether discharge from the Cross Mine receives any pre-treatment (e.g., lime) prior to entering the new treatment system.
 - f. Please clarify whether discharge from the Caribou Mine (Idaho Tunnel) receives any pre-treatment (e.g., lime) prior to entering the new treatment system. What treatment, if any, occurs via the existing “Caribou Water Treatment Shed”?
 - g. Please clarify whether untreated water from Pond 1 can still flow directly to Pond 2, and if so, under what conditions.
 - h. Please clarify whether untreated water from Pond 3c can still flow directly to Pond 2, and if so, under what conditions.
 - i. Please clarify if untreated water from Pond 2 can still flow directly to Coon Track Creek via each of the two existing discharge lines, and if so, under what conditions.
- 4) The Division has the following comments pertaining to Table 1 – Effluent Discharge Limitations for Outfall 001A:
- a. Please reference this table in the text to provide context for the information presented in the table.
 - b. The only parameters included in this table are Lead and Whole Effluent Toxicity. However, it is the Division’s understanding the operator’s discharge permit requires monitoring for additional parameters. Please modify this table to include all monitoring parameters and associated limitations required by the discharge permit.
- 5) Figure 2 – May 2021 Filtration Study that Compared the Effectiveness of Different Screen Size, May 31, 2021 is low resolution, making it difficult to read the data provided in this table. Please submit a higher resolution version of this table that is easier to read.
- 6) On page 8, under section 4, the operator states “This GIR initiative for alternative treatment commenced well before the cease and desist order was issued by CDPHE later in November 2011”. The Division is not aware of a cease and desist order issued by CDPHE in 2011. Did the operator mean to state “November 2021”? If so, please correct this date accordingly.
- 7) On page 10, under section 6, the operator states that overflow from Pond 1 would go to Pond 2 via overflow pipe, where it would be contained. If Pond 1 were to overflow into Pond 2, please describe what would happen to this untreated water. Does the operator have a way of treating water from Pond 2, if needed?

- 8) On pages 10 and 11, under section 6, the operator describes the new water treatment system operating at the site, which includes a combination of filtration and polishing components. The Division has the following comments pertaining to this system:
- a. Please describe the current frequency of filter bag changes. Does the operator expect this frequency to change throughout the year?
 - b. Please describe how the spent filter bags are disposed of. Are the spent filter bags considered hazardous waste?
 - c. Please describe the current expected lifespan of the polishing vessel (using the Graver MetSorb© HMRG media).
 - d. Please describe how the spent polishing vessel will be disposed of. Would this vessel be considered hazardous waste?
 - e. While the operator refers to only one polishing vessel in use by the current treatment operation, the Division is aware of a 2nd vessel present in the new treatment shed (as shown on Figure 13 in Appendix A). Please clarify the use of the 2nd polishing vessel, if any. Is it considered a backup only, at this time?
 - f. Please provide a discussion regarding the mine discharge rates throughout different seasons of the year, and whether the current water treatment system is designed to handle maximum flows.
 - g. On page 11, last paragraph, first sentence, the operator states “The pilot system described above is fully operational and since the installation of continuous 24/7 treatment (January 2021)...”. The date given is inconsistent with the timelines provided in the application. Please correct the date accordingly.
- 9) Tables 2 and 3 provide a summary of analytical results from sampling that occurred on January 17 and 18, 2022, to show the new water treatment system is producing results that are compliant with the discharge permit. Please add a column to these tables which includes the discharge permit limitations. Additionally, please explain why Zinc was detected in the Blank samples. Lastly, please provide any additional water quality data that has been collected since January 2022.
- 10) In Appendix A – Site Pictures, the Figure 9 caption reads “Cross Winze Valve Upgrade and XXX(Future Picture)”. Additionally, below this caption, a statement reads “Insert picture of Cross Winze or pump or piping”. Please add the intended photo or remove the confusing language which implies another photo was intended.
- 11) In Appendix A – Site Pictures, Figure 14 shows a photo of the “backwash tank” located inside the new water treatment shed. Please provide some additional information on the purpose of this tank, the nature of the water present inside the tank, whether the tank must be emptied regularly, and if so, where the water is poured.
- 12) Please provide a bond estimate that includes costs for operating and maintaining the entire water treatment system on a monthly basis.

- 13) The bond estimate calculated for Amendment No. 2 (AM-2; approved on February 8, 2022) includes costs for removing and disposing of a total of 777 feet of 6 inch diameter pipeline. According to Figure 1 – Water Management System, a total of 1,585.68 feet of pipeline is installed at the site, including a combination of 6 inch diameter and 8 inch diameter PVC and HDPE pipeline. Please provide a bond estimate that includes costs for removing and disposing of the additional 808.68 feet of pipeline.
- 14) The application includes a cover sheet for Appendix G – Standard Operating Procedures (SOP's) and Operation & Maintenance (O&M) Manuals. However, the Division could find no information submitted with this appendix. Please submit the information intended for Appendix G.
- 15) A groundwater monitoring plan is included in Appendix H. However, the Division could not find a surface water monitoring plan as required by corrective action #1 of the Board Order issued for Violation No. MV-2021-017. Please modify the monitoring plan provided to include both a groundwater and surface water monitoring plan. The surface water monitoring plan must include at a minimum, sampling locations along Coon Track Creek at a point upgradient of the mine site, at the discharge point, and at a point downgradient of the mine site. The list of surface water sampling parameters must include, at a minimum, the parameters required under the CDPHE discharge permit.
- 16) On page 10 of the groundwater monitoring plan, under section 5.3, the operator is proposing to use one of the three existing wells, the Cabin Well, as the point of compliance. The operator states the Cross Well is not a preferred choice for monitoring because it is influenced by mine dewatering and is located near the center of surface activity rather than downgradient of all activities that could potentially affect groundwater quality. The operator states the Caribou Well is installed upgradient of the permitted mine workings and lies across a probable groundwater divide (Coon Track Creek) from the Cross Mine. Based on the information provided thus far, the Division agrees that, of the three existing wells, the Cabin Well may be better suited as a point of compliance. However, monitoring from the other two existing wells could provide valuable data for understanding groundwater at the site (including characterizing any potentially impacted groundwater quality). Therefore, please include all three existing wells in the groundwater monitoring plan.
- 17) Please add the following two sampling locations to the groundwater monitoring plan: water from the Cross Mine prior to entering the treatment system and water from the Caribou Mine prior to entering the treatment system. Additionally, please be sure these monitoring locations are included on all applicable maps showing the proposed monitoring locations.
- 18) Please describe the “probable groundwater divide” and how it may affect using water level data from the Caribou Well to generate the potentiometric map.
- 19) On page 11 of the groundwater monitoring plan, under section 5.5, the operator states the analytical parameters for sampling (presented in Table 4) will consist of the most stringent of the criteria contained in Tables 1-4 of the Water Control Commission (WQCC) Regulation No. 41. However, the operator goes on to state that Regulation No. 41 (at 5 CCR 1002-41 2) exempts the Cross Gold Mine groundwater from complying with Agricultural use standards when “...other information demonstrates that agricultural use is not being made of the groundwater and is not likely to be made...”. The operator states the sub-alpine to alpine climate of the mine area is unsuitable for agriculture, and accordingly, the list of proposed sampling parameters presented in Table 4 does not

include the Agricultural specific standards listed in the Interim Narrative Standard Table 3 of WQCC's Regulation No. 41 - The Basic Standards for Ground Water.

Please be advised, the "exemption" referred to by the operator [and detailed in section 41.4(B)(2) of Regulation No. 41] applies only to classified groundwater areas. Because the Cross Gold Mine is located in an unclassified groundwater area, and the operator has not provided groundwater data demonstrating existing ambient quality as of January 31, 1994, the site must comply with the Interim Narrative Standard set by the WQCC in Regulation No. 41 – The Basic Standards for Ground Water. The Interim Narrative Standard requires that groundwater quality be maintained for each parameter at that quality which meets the most stringent criteria set forth in Tables 1 through 4 of The Basic Standards for Ground Water.

Therefore, please revise the sampling parameter list provided in Table 4 to include the following parameters and associated standards:

Aluminum, dissolved	5 mg/l
Boron, dissolved	0.75 mg/l
Cobalt, dissolved	0.05 mg/l
Copper, dissolved	0.2 mg/l
Fluoride, dissolved	2 mg/l
Lithium, dissolved	2.5 mg/l
Selenium, dissolved	0.02 mg/l
Vanadium, dissolved	0.1 mg/l
Zinc, dissolved	2 mg/L

20) On page 11 of the groundwater monitoring plan, under section 5.6, the operator states the quarterly sampling results will be reported to the Division within 30 calendar days of the operator's receipt of a complete analytical results package from the laboratory. Please commit to providing the quarterly water monitoring reports by the following deadlines:

- First quarter report due by May 1st of every year.
- Second quarter report due by August 1st of every year.
- Third quarter report due by November 1st of every year.
- Fourth quarter report due by February 1st of the following year.

21) Please commit to providing the Division a written report within five (5) working days when there is evidence of groundwater discharges exceeding applicable groundwater standards or permit conditions imposed to protect groundwater quality, in accordance with Rule 3.1.7(9). Please be advised, this notice requirement would apply to any exceedance of the approved groundwater monitoring standards set for the point of compliance well(s).

22) On page 11 of the groundwater monitoring plan, under section 5.6, the operator states the quarterly monitoring report will include a potentiometric surface (water table) map constructed from measurements made during sampling events and will note any exceedances of Regulation 41 Tables 1-4 water quality standards. Please commit to also including the following with the quarterly monitoring reports:

- a. A map showing the approved groundwater and surface water monitoring locations.
- b. The laboratory data packages and Chain of Custody sheets.
- c. Field sheets for the sampling event(s).

23) On pages 11 and 12 of the groundwater monitoring plan, under section 6, the operator describes the water quality sampling conducted at the site on November 9 and December 17, 2021, referred to as “baseline groundwater sampling”. The water quality data for these two sampling events is presented in Tables 5 and 6. The operator indicates this data reveals “clear trends in water quality”. The Division has the following comments pertaining to the data provided in Tables 5 and 6:

- a. Please update these tables to include a footnote stating the November 2021 samples were not correctly filtered in the field. Additionally, please provide a discussion on how the samples were incorrectly filtered in the field and what affects this had on the laboratory data.
- b. Please provide the field sampling data sheets from the November and December 2021 sampling events.
- c. This “baseline” data set is incomplete as it does not include all sampling parameters required by WQCC’s Interim Narrative Standard for unclassified groundwater, and it was collected from only two sampling events (one of which was incorrectly collected in the field) that occurred a little more than a month apart. No discernible trends can be determined from this data. In order to establish “baseline” groundwater quality conditions, the operator will need to provide five consecutive quarters of groundwater monitoring data that include all sampling parameters and standards required by the Interim Narrative Standard. Please describe how the operator intends to collect the required baseline groundwater data in a manner that ensures groundwater quality at the site is not impacted by site activities in any way during the collection period.
- d. Given the current Board-Ordered deadline of approving this revision no later than April 28, 2022, the Division expects the required five quarters of baseline groundwater monitoring data will need to be provided in a subsequent revision. Therefore, please commit to submitting a subsequent Technical Revision, which includes five quarters of groundwater sampling data from all three existing wells plus the two additional sampling points requested above (inside Cross Mine and Caribou Mine), for all parameters and standards required by the Interim Narrative Standard. This revision must include an evaluation of the data obtained, including a side-by-side comparison of the laboratory results for each parameter with its associated Interim Narrative Standard. In its review of this subsequent revision, the Division will reassess the sampling parameters and standards for the continued monitoring program.

24) There is no discussion in the sampling plan regarding Quality Assurance and Quality Control (QA/QC) sampling (e.g., rate of duplicate collection, rinsate blanks, field blanks, trip blanks). Please update this sampling plan to address how QA/QC sampling will be conducted at the site for both surface and groundwater sampling.

- 25) Please provide a generalized cross-section of the site which includes the approximate mine pool level of the Cross Mine (at both natural and dewatered conditions), groundwater levels in the Cross Well and Cabin Well, and shows the approximate location of any applicable surface features, including mine features and Coon Track Creek.
- 26) Please provide a generalized cross-section of the site which includes the approximate mine pool level of the Caribou Mine (at both natural and dewatered conditions), groundwater levels in the Caribou Well and Cabin Well, and shows the approximate location of any applicable surface features, including mine features and Coon Track Creek.
- 27) The Division has the following comments regarding Map 2 – Site Map – Groundwater Monitoring Plan:
- a. Please change the map title to “Surface and Groundwater Monitoring Plan”.
 - b. Please clearly label all proposed surface and groundwater monitoring locations.
 - c. Please clearly label the proposed compliance well.
 - d. Please be sure the mine features shown on this map correlate with those shown on the maps approved in AM-2. For example, this map shows a “Temporary Ore Storage” area located just south of the Cross Warehouse, which was removed from the maps in AM-2.

This completes the Division’s preliminary adequacy review of the materials submitted for TR-10. The decision date for TR-10 is currently set for **March 30, 2022**. If additional time is needed to address the adequacy item(s), an extension request must be received by our office prior to the decision date. Please be advised, the Board Order issued for Violation No. MV-2021-017 requires this revision to be approved within 60 days of receipt, no later than April 28, 2022. Therefore, the Division will be unable to approve any extensions beyond that date.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,



Amy Eschberger
Environmental Protection Specialist

Cc: Richard Mittasch, Grand Island Resources, LLC
Patrick Lennberg, DRMS
Jared Ebert, DRMS
Michael Cunningham, DRMS