

July 3, 2019

Jim Harrington  
Colorado Legacy Land, LLC  
4601 DTC Blvd. - Suite 130  
Denver, CO 80237

**Re: Schwartzwalder Mine, Permit No. M-1977-300, Technical Revision No. 28 (TR-28),  
Adequacy Review No. 3**

Mr. Harrington:

The Division of Reclamation, Mining and Safety (Division) has reviewed your adequacy response submitted on June 18, 2019 for Technical Revision No. 28 (TR-28), and identified the following adequacy items that must be addressed before an approval of TR-28 can be issued:

- 1) The operator revised Sheet 1 to include the approved permit boundary, as requested. However, the operator stated this could not be done on Sheet 3 because the area shown on this figure is within the permit boundary, which is not shown at this scale. On the revised Sheet 1, the permit boundary clearly follows the outside edge of the NWRP, the area of which is shown in closer detail on Sheet 3. Therefore, please revise Sheet 3 to show the portion of the permit boundary as it exists in the area shown on this figure.
- 2) Please be sure that all exhibits/maps submitted conform to the criteria required by Rule 6.2.1(2):
  - a. Show name of Applicant;
  - b. Must be prepared and signed by a registered land surveyor, professional engineer, or other qualified person;
  - c. Give date prepared;
  - d. Identify and outline the area that corresponds with the application;
  - e. With the exception of the map of the affected lands required in Section 34-32-112(3)(e), C.R.S. 1984, as amended, shall be prepared at a scale that is appropriate to clearly show all elements that are required to be delineated by the Act and these Rules. The acceptable range of map scales shall not be larger than 1 inch = 50 feet nor smaller than 1 inch = 660 feet. Also, that a map scale, appropriate legend, map title, date, and a north arrow shall be included.
- 3) Please address all adequacy items identified in the enclosed letter from Tim Cazier, P.E..



This completes the Division's 3<sup>rd</sup> adequacy review of the materials submitted for TR-28. The decision date for TR-28 is currently set for **July 12, 2019**. If additional time is needed to address adequacy items identified by the Division, an extension request must be received by our Office prior to the decision 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](mailto:amy.eschberger@state.co.us).

Sincerely,

A handwritten signature in blue ink that reads "Amy Eschberger".

Amy Eschberger  
Environmental Protection Specialist

Encl: Second Adequacy Review letter from Tim Cazier, P.E., DRMS, dated July 3, 2019

CC: Elizabeth Busby, Colorado Legacy Land, LLC  
Paul Newman, Colorado Legacy Land, LLC  
Tim Cazier, P.E., DRMS  
Michael Cunningham, DRMS



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

Date: July 3, 2019  
To: Amy Eschberger  
From: Tim Cazier, P.E.  
RE: Schwartzwalder Mine, DRMS File No. M-1977-300  
TR-28, Revised North Waste Rock Pile Drainage Design Engineering  
Second Adequacy Review

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The Division of Reclamation, Mining and Safety (Division) engineering staff has reviewed the response letter (from Colorado Legacy Land) and five revised drawings (by Alexco Water & Environment) for Technical Revision No. 28 (TR-28), received on June 18, 2019. The response letter addressed each of the original 6 engineering staff comments in a “Comment and Response Summary Table” with the engineering staff comment #1 as Item #2 in the summary table and so on. For the purpose of tracking, the original Division engineering staff comment number is retained below, followed by the summary table number in brackets (e.g., 1. [2]).

**Letter:**

1. [2] Drainage Design. The response indicates runoff draining to the contact between the NWRP and native slope directly upgradient of the NWRP will flow down the access road as it has done “historically”. The proposed pipeline will require this area be significantly disturbed for the pipe installation, including proposed fill in some areas. What hydrologic and hydraulic analyses, and rehabilitation/restoration design for the access road channel have been done to ensure the access road will continue to perform as it has and not subject the proposed pipeline and NWRP environmental protection facility (EPF) to potentially damaging scour and erosion? The Division requires a designed conveyance structure for runoff from this 4.1-acre area, pursuant to Rule 7.3.1(3). Please provide these analyses and designs.
2. [3] Hydraulic Design. Additional clarification is required.
  - a. The response indicates the system is designed to operate under open channel conditions, yet the majority of the 30-inch pipe alignment on Sheet 4 shows the hydraulic gradeline above the top of pipe and the energy gradeline as high as 30 feet above the pipe invert at the manholes. This result indicates the system will operate mostly under pressure flow. Furthermore, it is somewhat counterintuitive the hydraulic gradeline for the 30-inch pipe indicates the flow is open channel immediately downgradient of the upper and middle manholes, transitioning to pressure flow as flow approaches the downgradient manhole,



with an approximate five-foot hydraulic gradeline drop across these manholes. Entrance and exit losses typically result in higher hydraulic gradients at manholes. The opposite appears to be the case at the lower manhole, where the pipe gradient is flatter (again counterintuitive) with open channel flow entering the manhole (at STA 5+26.55). Please explain how the system is designed to operate under open channel flow conditions when it is mostly pressure flow conditions, and explain the unusual hydraulic performance.

- b. Given the apparent high pressure at the upper and middle manholes, the Division is concerned about the reliability and safety of the bolted lids at the manholes as well as the likely possibility of high pressure leaks developing at pipe joints, potentially forcing unknown amounts of water into the NWRP in a similar fashion to observed failures in municipal water supply lines under city streets. This particular design is contrary to Rules 3.1.5(10) and (11), 6.4.21(6) and (10), and 7.3.1(3). Please address the concerns related to safety of the manhole covers and the potential for water to enter the NWRP through pressure leaks at the pipe joints.
- c. There is a discrepancy between the response statement in the third paragraph of Comment #3: “Tree branches and large debris will not enter the pipe due to the trash rack at the headwall.” and that of the second sentence in the first paragraph of Comment #5: “The trash rack at the headwall will prevent the majority of tree branches and debris from entering the system.” The Division is inclined to accept the latter statement and given the pressure flow discussed above, is more concerned with how potential debris clogging could lead to pipe joint leakage into the NWRP. Please clarify the discrepancy.
- d. The question where surcharge would flow was not answered. Bolted lids will not control surcharge at the headwall inlet resulting from clogged pipe or flows exceeding the design flow. Surcharge flow over the NWRP is not acceptable. Please respond to where surcharge flows would be directed.

**Drawings (Sheets 1 through 5):**

3. [4] Sheet 2. Additional clarification is required:

- a. Given the depth to bedrock is unknown, the presence of shallow bedrock will require additional vertical bends in a field fit design, thereby potentially decreasing the performance of the revised proposed design. The Division will require a hydraulic analysis of an As-Built design as an addendum to this TR. The analysis may result in unacceptable performance requiring expensive reconstruction. The modified design required to meet performance standards would require the submittal of a new technical revision to evaluate the modified design.

- b. ...will blasting be required? No further response is required at this time.
  - c. The response states excavation into the waste rock will occur under the access road. How will the integrity of the EPF be maintained during and post construction? Please provide a plan for handling waste rock pursuant to Rule 3.1.5(2) and (5). As this is an EPF, any disturbance of the waste rock will require recertification of the facility pursuant to Rule 7.3.1(5).
  - d. Trench maintenance...? No further response is required at this time.
4. [5] Sheets 3 and 4. How will the pipe be inspected and maintained before and after closure? Maintenance is of critical importance to a pipeline proposed as a reclamation/closure design. The Division asked how these actions will be performed. The response stated how they “*could*” be performed. The Division requires a written statement committing to a particular method for inspection and maintenance for the life of the permit. Please specify the procedures/methods to be implemented for inspection and maintenance while the permit is active.
5. [6] Please provide design calculations. The response is adequate.
6. Sheet 5. Trash rack: The original comment requested both the trash rack specifications and drawing details. Only the specifications were provided. Please provide the detail drawings.
- a. Sheet 5 also presents the design for the entrance headwall. No dimension is provided for the cutoff wall at the inlet. Please dimension this feature.

## SUMMARY

These comments are based on Rules 3.1.5, 6.4.21 and 7.3.1 which in aggregate compel the Division to approve designs that will ensure the protection of environmental protection facilities (EPFs) with minimal maintenance. The Division has concerns related to pressure flow, potential clogging, extreme bends (83° at ~Sta. 0+88 and 113° at ~Sta. 5+26.55), and potential pipe leakage, and cannot accept the design as proposed. A pipeline may not be a viable option for EPF protection.