



MINERALS PROGRAM INSPECTION REPORT
PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME: Schwartzwalder Mine	MINE/PROSPECTING ID#: M-1977-300	MINERAL: Uranium	COUNTY: Jefferson
INSPECTION TYPE: Monitoring	INSPECTOR(S): Amy Eschberger, Michael Cunningham	INSP. DATE: June 26, 2020	INSP. TIME: 09:30
OPERATOR: Colorado Legacy Land, LLC	OPERATOR REPRESENTATIVE: Billy Ray, Liz Busby, Paul Newman	TYPE OF OPERATION: 112d-2 - Designated Mining Operation	
REASON FOR INSPECTION: Normal I&E Program	BOND CALCULATION TYPE: None	BOND AMOUNT: \$8,900,000.00	
DATE OF COMPLAINT: NA	POST INSP. CONTACTS: None	JOINT INSP. AGENCY: None	
WEATHER: Clear	INSPECTOR'S SIGNATURE: 	SIGNATURE DATE: July 7, 2020	

GENERAL INSPECTION TOPICS

This list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each. No problems or possible violations were noted during the inspection. The mine operation was found to be in full compliance with Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials and/or for Hard Rock, Metal and Designated Mining Operations. Any person engaged in any mining operation shall notify the office of any failure or imminent failure, as soon as reasonably practicable after such person has knowledge of such condition or of any impoundment, embankment, or slope that poses a reasonable potential for danger to any persons or property or to the environment; or any environmental protection facility designed to contain or control chemicals or waste which are acid or toxic-forming, as identified in the permit.

(AR) RECORDS----- <u>Y</u>	(FN) FINANCIAL WARRANTY----- <u>N</u>	(RD) ROADS----- <u>Y</u>
(HB) HYDROLOGIC BALANCE----- <u>N</u>	(BG) BACKFILL & GRADING----- <u>Y</u>	(EX) EXPLOSIVES----- <u>N</u>
(PW) PROCESSING WASTE/TAILING---- <u>N</u>	(SF) PROCESSING FACILITIES----- <u>Y</u>	(TS) TOPSOIL----- <u>N</u>
(MP) GENL MINE PLAN COMPLIANCE- <u>Y</u>	(FW) FISH & WILDLIFE----- <u>N</u>	(RV) REVEGETATION---- <u>Y</u>
(SM) SIGNS AND MARKERS----- <u>N</u>	(SP) STORM WATER MGT PLAN---- <u>N</u>	(RS) RECL PLAN/COMP-- <u>Y</u>
(ES) OVERBURDEN/DEV. WASTE----- <u>N</u>	(SC) EROSION/SEDIMENTATION--- <u>N</u>	(ST) STIPULATIONS----- <u>N</u>
(AT) ACID OR TOXIC MATERIALS----- <u>N</u>	(OD) OFF-SITE DAMAGE----- <u>N</u>	

Y = Inspected and found in compliance / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

OBSERVATIONS

This was a normal monitoring inspection of the Schwartzwalder Mine (Permit No. M-1977-300) conducted by Amy Eschberger and Michael Cunningham of the Division of Reclamation, Mining and Safety (Division). The operator was represented by Elizabeth Busby, Billy Ray, and Paul Newman during the inspection. The site is located approximately 6 miles northwest from Golden, CO in Jefferson County. Access to the site is off Glencoe Valley Road. This site is on a quarterly inspection frequency. This inspection serves as the 2nd quarter 2020 inspection. **Photos 1-39** taken during the inspection are included with this report.

This is a 112d-2 underground uranium mine with a permit area of 72.24 acres. The site is situated at the bottom of a canyon, adjacent to Ralston Creek. The site was mined by Cotter Corporation, then Colorado Legacy Land, LLC took over the permit in 2018 to complete reclamation of the site. Since that time, the operator has relocated water treatment plant operations to the mesa south of the creek, demolished structures in the valley, placed demolition debris underground, and begun excavating contaminated alluvial fill in the valley and placing the material underground per the approved permit. The operation continues to conduct surface water and groundwater monitoring on a quarterly basis, and to treat mine pool water and alluvial groundwater via in-situ methods and a water treatment plant.

The water treatment plant was temporarily offline during the inspection while the reverse osmosis (RO) membranes were being cleaned. The plant was expected to be back online that afternoon. The mine pool was at 184 feet below Steve Level, which is 34 feet below the required 150 foot depth. The last in-situ (carbon) treatment of the mine pool took place in January. According to the operator, after the last treatment, uranium concentrations in the mine pool have dropped to approximately 5 mg/L (below the usual 11-14 mg/L), which indicates full mixing of the mine pool may have occurred. Mine water is now pumped from the Jeffrey Air Shaft (instead of the Steve Adit) and conveyed downhill via a double-walled HDPE pipeline to a holding tank located on the east side of the water treatment plant.

The Division observed the discharge tank located at the southeastern corner of the water treatment plant from which water treated through the plant is discharged via pipeline to Ralston Creek at surface monitoring location SW-BPL under the CDPHE discharge permit. The operator had recently completed a deep clean on the tank and also installed a new sampling port which had not been used yet. This work was done after the operation failed a routine Whole Effluent Toxicity (WET) test completed in June per the CDPHE discharge permit. The operator is currently performing accelerated testing per CDPHE protocols. Depending on the results of the additional testing, CDPHE may require an increased frequency of routine monitoring or a Toxicity Identification (or Reduction) Evaluation be performed. If no pattern of toxicity is found, the operator can return to routine WET testing as outlined in the permit. The operator indicated the preliminary laboratory results are looking good so far. It appears that cleaning the tank may have mitigated the issues which led to the initial WET test failure. The operator also believes that using the new sample port for future sampling will provide a more representative sample of the water that is discharged from the tank. If CDPHE were to issue a notice of non-compliance or a violation for the operation, the operator must notify the Division of such notice and include a plan for regaining compliance.

The wetland and biochemical reactor (BCR) pilot-scale study continues on top of the mesa, east of the water treatment plant. The primary focus of this study is to evaluate whether uranium can be treated biologically. The effluent from the study is discharged to Sump 5 below the mesa at a rate of approximately 30 mL/min (maximum of approximately 90 mL/min). All water collected in Sump 5 is routed to the water treatment plant (along with any water collected from other sumps), sampled for water quality analysis, then discharged to the mine pool. The effluent from the wetland study may need to be routed to another sump once the alluvial excavation project moves further south. The small greenhouse constructed around the BCRs to keep them above

50°F over the winter has been deconstructed for the summer. The greenhouse parts are stored near the study area and could be easily reassembled next winter if needed. This study has been underway for about a year now, and the operator expects to have a complete data set for analysis later this year. Based on the results of this study, the operator may wish to increase the scope and scale of this project. The Division informed the operator any plans to upscale the project, including adding any features that require reclamation, must be submitted in a permit revision for Division review and approval.

The alluvial excavation project was underway (although no excavation activities were occurring during the inspection). There are two primary excavation areas identified in the valley south of the creek. The northern excavation area stretches from the southern edge of the South Waste Rock Pile (SWRP) to the new water treatment plant area, and the southern excavation area stretches from the new water treatment area to the area where Sump 8 is located. Current excavation activities are in the northern excavation area, near the Black Forest Mine portal and also below the mesa where the new water treatment plant is located. The operator intends to complete the alluvial excavation project this year. Currently, excavated material is temporarily stored on the floor of the excavated pit and then hauled up to the Minnesota Mine for disposal. The material is placed inside the CV Glory Hole (in the Minnesota Mine) in accordance with the approved permit.

In late 2019, the operator informed the Division the contaminated alluvial fill in the valley may be more extensive than originally estimated, and the CV Glory Hole may not have adequate capacity for the excess material. Therefore, the operator was exploring the possibility of placing the additional material in the Black Forest Mine. The Division informed the operator that an Amendment application would be required for such a proposal. During the current inspection, the operator indicated it had not yet been determined whether the additional underground capacity would be needed. The operator will have a better idea of expected material volumes later this summer after additional excavation work has been completed. While the operator is authorized to place additional material onto the existing waste rock piles, it is not preferred at this point given the reclaimed state of the piles and the potential seep issue with the North Waste Rock Pile (NWRP).

The Division inspected the upgradient cutoff wall and observed that all flows in Ralston Creek were being routed through the bypass pipeline. The Division also inspected the areas adjacent to Glencoe Valley Road (near the toe of the NWRP) located upstream from the cutoff wall, where red-and green-colored ponded water was observed during the Division's March 22, 2019 inspection. Based on the known stormwater management issues that exist at the NWRP and the water quality data the operator obtained from the ponded water, this water is believed to represent seep water from the NWRP. These "seep areas" were dry during the Division's November 7, 2019 inspection and were not inspected during the Division's February 26, 2020 inspection. During the current inspection, the Division observed red-colored water ponded in the wooded area adjacent to the creek and slightly green-colored water ponded in the roadside ditch near the toe of the NWRP. The Division is not aware of any additional water quality sampling of this ponded water that has occurred besides the samples that were collected in March of 2019. It is assumed the ponded water observed during the current inspection is similarly impacted. This matter was cited as a problem pursuant to Rule 3.1.6(1) in the Division's April 9, 2019 inspection report. On May 9, 2019, the operator submitted Technical Revision No. 28 (TR-28) to address this issue by installing a stormwater diversion structure along the edge of the NWRP to direct surface flows (particularly from the ephemeral drainage above) around the pile.

The stormwater diversion structure design approved in TR-28 (on March 27, 2020) includes installation of a concrete-filled geoweb channel along the northern edge of the NWRP to convey surface flows from the drainage around the pile to the creek below (above the cutoff wall). The intake structure of the channel will include a concrete seal wall designed to intercept potential groundwater by being embedded into the shallow bedrock. A perforated pipe will be buried parallel to the seal wall to collect any groundwater that reaches the wall and convey it downhill in a solid PVC pipe to discharge into the channel. The estimated schedule

submitted with TR-28 anticipated the construction phase would occur from May through August of this year. The COVID-19 pandemic has impacted these plans, delaying the start of construction by about a month. At the time of the inspection, the operator had surveyed and staked out the channel alignment and confirmed depth-to-bedrock at the headwall intake (in the drainage above the NWRP). The material excavated at the headwall intake is currently stockpiled on top of the NWRP. An excavator was also stored on top of the pile. Radiation testing will be performed on the excavated material, and any "hot" material will be placed in the Minnesota Mine. If the material tests "clean" it will be used for grading projects on site. Some slight changes to the channel alignment (from what was shown in TR-28) were made based on field conditions. The updated alignment will be shown in the final as-built drawings to be provided to the Division after the project is completed. The construction project will proceed in three primary phases, after which, the Division will inspect and approve work completed prior to the next phase commencing.

The approved water monitoring program for the site (see enclosed monitoring location maps approved with TR-27 and TR-29) includes a total of 18 groundwater monitoring locations, including 16 monitoring wells, a raw feed (mine pool) monitoring location inside the water treatment plant, and a sump water monitoring location inside the plant (combined collected sump water). The program also includes a total of 13 surface water monitoring locations along Ralston Creek, including a location upstream from the mine, seven locations within the mine impacted area, and five locations downstream of the mine (outside of the approved permit area). Because creek flows are captured at the upgradient cutoff wall and routed around the mine site via pipeline (to be discharged at SW-BPL), the six monitoring locations within the mine impacted area (below the cutoff wall) are typically dry.

All surface and groundwater monitoring locations are sampled on a quarterly basis and the results provided to the Division along with the daily average mine pool elevation data. The compliance monitoring location established for the mine site is SW-BPL, at which, the operator discharges water captured above the upgradient cutoff wall and treated water from the mine site under a discharge permit maintained with CDPHE. The water discharged at this location must meet specific water quality standards under the discharge permit, including uranium concentrations of no greater than 0.3 mg/L. The operator copies the Division on the monthly monitoring reports submitted to CDPHE for the discharge permit. The last exceedance observed at SW-BPL occurred during the December 2018 sampling event, where dissolved uranium concentrations were at 0.0353 mg/L. This exceedance was attributed to the water treatment plant being offline that month, thus only water captured from above the upgradient cutoff wall (potentially impacted by the NWRP) was being discharged at the monitoring location. Without the additional water discharged from the water treatment plant, there was less dilution at SW-BPL, potentially resulting in the increased concentrations observed. No further uranium exceedances have occurred at SW-BPL since that time according to the monthly reports received by the Division.

During the inspection, the Division observed the following surface water monitoring locations on Ralston Creek: SW-AWD (upgradient of the mine site), SW-FBRG (directly downstream of the mine site and the discharge location SW-BPL), SW-ARH (downstream of SW-FBRG), and SW-LLHG (downstream of SW-ARH). Photos taken of these monitoring locations are included with this report (Photos 32-39). During the inspection, the Division discussed with the operator concerns expressed by Denver Water regarding uranium concentrations observed at surface monitoring locations downstream from the mine site. The operator has begun collecting stream flow data at surface water monitoring locations which they believe will be helpful in understanding the water quality data and also the nature of the creek at monitoring locations. A meeting will be scheduled in the coming weeks to discuss Denver Water's concerns.

Given that it has been almost 2-1/2 years now since the permit was transferred through SO-1 (approved on February 16, 2018), the Division would like to remind the operator of Condition No. 2 of SO-1 approval, which

requires submittal of an Amendment application to affirm the permanent cessation of mining activities, provide a conceptual site model, provide a plan for addressing the physical and chemical stabilization of the mine pool and specifically addressing the concentrations of dissolved uranium and other constituents as required under the conditions of the permit, and updating the reclamation and environmental requirements.

While no deadline was specified for Condition No. 2, the Division believes the new operator has had sufficient time operating the site to develop a conceptual site model for final reclamation. The Division understands the new operator wishes to collect additional data to aid in developing the conceptual model. However, there must be an updated reclamation plan (and bond estimate) in place for the site to account for existing conditions. Subsequent to the Division's approval of the required Amendment application, the permit could be further modified through the Technical Revision or Amendment process if additional data and analysis indicates such a modification is necessary. **Within 30 days of the date of this inspection report, the operator shall provide an estimated timeline for submittal of the Amendment application (required by SO-1 approval).**

This concludes the report.

Any questions or comments regarding this inspection report should be forwarded to Amy Eschberger at the Colorado Division of Reclamation, Mining and Safety, 1313 Sherman Street, Room 215, Denver, CO 80203, via telephone at 303-866-3567, ext. 8129, or via email at amy.eschberger@state.co.us.

PHOTOGRAPHS



Photo 1. View looking southeast across area east of water treatment plant where wetland and BCR pilot-scale study is conducted.



Photo 2. View looking south at BCR system set up for pilot-scale study conducted in area east of water treatment plant.



Photo 3. View looking southeast at wetland treatment system set up for pilot-scale study conducted in area east of water treatment plant.



Photo 4. View looking northwest at new water treatment plant constructed on top of mesa south of Ralston Creek.



Photo 5. View looking northwest at discharge tank located at southeastern corner of water treatment plant, from which treated water is discharged (through pipeline shown at bottom right) to Ralston Creek at SW-BPL.



Photo 6. Side view of discharge tank shown in Photo 5. This tank was deep cleaned recently and a new sampling port was installed (circled). The old sampling port is located at the back of the tank (under green bucket; location indicated with arrow).



Photo 7. View looking north across northern portion of northern excavation area located south of SWRP near Black Forest Mine portal (visible in background, at top left of photo).



Photo 8. View looking northeast across northern edge of northern excavation area located south of SWRP near Black Forest Mine portal.



Photo 9. View looking northeast across northern portion of northern excavation area located south of SWRP near Black Forest Mine portal.



Photo 10. View looking east across northern portion of northern excavation area located south of SWRP near Black Forest Mine portal.



Photo 11. View looking southeast across central portion of northern excavation area.



Photo 12. View looking west across central portion of northern excavation area.



Photo 13. View looking southeast across northern portion of northern excavation area.



Photo 14. View looking south across southern portion of northern excavation area located near new water treatment plant area.



Photo 15. View looking at upgradient cutoff wall/headgate in Ralston Creek, showing creek flowing upstream of cutoff wall during inspection.



Photo 16. View looking downstream from upgradient cutoff wall in Ralston Creek, showing creek channel dry downstream of cutoff wall during inspection.



Photo 17. View looking north along Glencoe Valley Road at toe of NWRP, showing roadside ditch (at left) in which slightly green-colored water was ponded during inspection. This water is believed to be “seep water” from the NWRP.



Photo 18. View looking south along Glencoe Valley Road at toe of NWRP, showing roadside ditch (at right) in which slightly green-colored water was ponded during inspection. This water is believed to be “seep water” from the NWRP.



Photo 19. View of slightly green-colored water ponded in roadside ditch near toe of NWRP during inspection. This water is believed to be “seep water” from the NWRP.



Photo 20. View of red-colored water ponded (indicated) in wooded area between Ralston Creek and road near toe of NWRP. This water is believed to be “seep water” from the NWRP.



Photo 21. View looking northwest across northern edge of NWRP where alignment of stormwater diversion channel (approved in TR-28) has been staked out (stakes circled).



Photo 22. View looking southwest across northern edge of NWRP where alignment of stormwater diversion channel (approved in TR-28) has been staked out (stakes circled).



Photo 23. View looking northeast across top of NWRP toward ephemeral drainage above the pile (in background). Note alignment of stormwater diversion channel (approved in TR-28) has been staked out (stakes circled).



Photo 24. View looking northeast across excavated area at top of NWRP where concrete seal wall will be installed in accordance with TR-28.



Photo 25. View looking southwest across top of NWRP showing excavator and stockpiled material excavated from drainage area temporarily stored on top of pile.



Photo 26. Closer view of stockpiled material excavated from drainage area temporarily stored on top of NWRP. Radiation testing will be performed on this material to determine whether it will require disposal in the Minnesota Mine.



Photo 27. View looking northwest from top edge of NWRP showing Glencoe Valley Road (near center) and Ralston Creek (in wooded area near road).



Photo 28. View looking south from top edge of NWRP showing SWRP located on other side (south) of creek, stable with good grass cover.



Photo 29. View looking southeast from top edge of NWRP toward mine site (in far background). Note portion of SWRP shown at right, stable with good grass cover.



Photo 30. View looking east across area located north of NWRP where stormwater diversion channel dissipation basin (approved in TR-28) will be installed. Stakes (circled) mark alignment of this structure.



Photo 31. View looking west across Glencoe Valley Road from north of NWRP showing area where stormwater diversion channel dissipation basin roadway crossing (approved in TR-28) will be installed. Stakes (circled) mark alignment of this structure.



Photo 32. View looking upstream in Ralston Creek at surface water monitoring location SW-AWD located upstream of all mine disturbance (including waste rock piles).



Photo 33. Closer view of Ralston Creek at surface water monitoring location SW-AWD, located upstream from all mine disturbance (including waste rock piles).



Photo 34. View looking downstream on Ralston Creek at surface water monitoring location SW-FBRG located downstream of mine site (outside permit area), below SW-BPL.



Photo 35. Closer view of Ralston Creek at surface water monitoring location SW-FBRG located downstream of mine site (outside permit area), below SW-BPL.



Photo 36. View looking upstream on Ralston Creek at surface water monitoring location SW-ARH located downstream of mine site (outside permit area), below SW-FBRG.



Photo 37. Closer view of Ralston Creek at surface water monitoring location SW-ARH located downstream of mine site (outside permit area), below SW-FBRG.



Photo 38. View looking downstream on Ralston Creek at surface water monitoring location SW-LLHG located downstream of mine site (outside permit area) at Long Lake Headgate, below SW-ARH.



Photo 39. View looking downstream from surface water monitoring location SW-LLHG located downstream of mine site (outside permit area), below SW-ARH.

Inspection Contact Address

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

Encls: Groundwater monitoring locations map, approved in TR-29
Surface water monitoring locations map, approved in TR-27

CC: Elizabeth Busby, Ensero Solutions at: ebusby@ensero.com
Billy Ray, Ensero Solutions at: bray@ensero.com
Paul Newman, Colorado Legacy Land, LLC at: paul@coloradolegacy.land
Eric Williams, Colorado Legacy Land, LLC at: eric@coloradolegacy.land
Michael Cunningham, DRMS at: michaela.cunningham@state.co.us

FIGURE 3

PROPOSED GROUNDWATER
MONITORING LOCATIONS

NOVEMBER 2019



- GW Monitoring Well
- Pumpback Sump
- Existing Mine Feature Footprint
- Proposed Mine Feature Footprint
- Waste Rock Dump
- Retention Pond
- Watercourse

Note: MW-1, MW-2, MW-3 and MW-9 were removed during the alluvial soil excavation. MW-8, MW-10, MW-11, and MW-16 are not currently sampled.

1:6,800 when printed on 8x11 inch paper



Satellite imagery obtained from ArcGIS on services.arcgisonline.com on November 2019

Datum: NAD 1983 (CORS96) StatePlane Colorado Central FIPS 0502 (US Feet)

This drawing has been prepared for the use of Alexco Water and Environment Inc.'s client, Colorado Legacy Land, LLC and may not be used, reproduced or relied upon by third parties, except as agreed by Alexco Water and Environment Inc. and Colorado Legacy Land, LLC as required by law or for use of governmental reviewing agencies. Alexco Water and Environment Inc. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Alexco Water and Environment Inc.'s express written consent.

D:\Project\AIP\Projects\Schwartzwalder\Map\02-Water_Quality\02-Groundwater\GWD_Location_Letter_20191119.mxd
(Last edited by: mduchame, 11/19/2019 5:45 PM)



