

Site Update

Silver Dyke Adit and Drainage Site

Operational Period 8

September 4 - 10, 2023

Site Description

The Silver Dyke Mine Adit and Drainage Site is located within Operable Unit 3 (OU3) of the Carpenter-Snow Creek Mining District National Priorities List (NPL) Site (CSCMD Site), near the Town of Neihart, Cascade County, Montana. This emergency response includes initial activities to address severe erosional damage to the area around and down drainage of the Silver Dyke Mine adit that was caused by a high level of snowmelt followed by extremely heavy rains this past Spring.

Announcements

Drilling will not start on 9/11/2023. EPA anticipates occasional sediment releases and water discoloration resembling rainfall runoff in the drainage between the Silver Dyke adit and Carpenter Creek during construction activities.

Site Goals

Goal 1: Improve water management and erosion control.

- a. Divert water away from the drainage above the adit (**complete**).
- b. Stabilize the slope above the adit to support construction (**complete**).
- c. Complete stabilization of the slope above the adit (**complete**).
- d. Upgrade the bridge/water crossing at Carpenter Creek (**in progress**).
- e. Restore disturbed areas.
- f. Repair the toe of the two large fluvial tailings ponds (**in progress**).

Goal 2: Open and stabilize the Silver Dyke Adit.

- a. Prep the "Glory Hole" to receive waste (**complete**).
- b. Remove waste rock from below the adit to the Glory Hole (**complete**).
- c. Construct containment ponds below the adit (**one complete, one in progress**).
- d. Provide a stable flow channel for the adit drainage (**complete**).
- e. Conduct geophysical surveys (**complete**).
- f. Prep drill site above the adit (**complete**).
- g. Drill into and drain the adit (**in progress**).
- h. Remove material blocking the adit to the Glory Hole.
- i. Install structure to keep the adit open and draining.
- j. Remove containment ponds.

Operational Period 8 Objectives

The following were the Objectives for this past Operational Period:

1. Continue construction of containment ponds below the adit.
2. Complete pad to drill into adit.
3. Continue building stable flow channel for the adit discharge.
4. Continue road improvement, run on/off and erosion control work.
5. Continue to harvest rock for use on drainage controls.

6. Other Site management tasks.

Operational Period 8 Accomplishments

- The Team completed construction of the upper water management pond which is directly below the plugged adit. The capacity of this pond is estimated to be 60,000 gallons. EPA reassessed the lower pond and decided to add additional capacity. The capacity of the lower pond is now estimated to exceed 160,000 gallons. Work to finish the improvements to this lower pond is nearly complete.
- EPA's crew continued to maintain roadways around the Site after several rainfalls and regraded the access to the Glory Hole.
- EPA completed a detailed analysis of the hazards that are potentially posed by water which could be backed up behind the blocked adit and finalized its plans to minimize these hazards. The information that was available to the Response Team during this effort included:
 - A 1926 drawing of the mine working which includes a layout and a relative scale.
 - Information about the portal blockage interior dimensions of the portal that was collected when the mine workings were last explored in the late 1960s to early 1970s. This exploration effort was the basis for a 1971 survey of the mine that was also utilized by the Response Team.
 - Other maps of the mine workings that were obtained from BP-ARCO.
 - Hydrologic data collected by EPA and Montana DEQ since 2012.
 - Observations by EPA's Response Team.
- When EPA initiated emergency response activities in May and June 2023, the adit blockage was fully saturated and seeps of water were visible above the top of the adit. Since that time, the blockage has dried and the water seeps have consistently moved down the slope indicating that the pool of water behind the blockage has drained to a water level of 2.5 to 3 feet. Combining this information with a 1 percent adit grade and an average mine workings width dimension of 10 feet, the predicted amount of water behind the blockage is 47,500 to 67,500. For planning purposes, EPA is assuming a more conservative water height of 5 to 6 feet which equates to 95,000 to 135,000 gallons.
 - To verify the amount of water behind the blockage, EPA's Response Team started by collecting and processing geophysical data to identify the approximate location of the mine tunnel behind the adit. There are inherent errors to the use of geophysical data but it allowed the Team to identify the best possible location for a drill rig. The Team completed construction of a drilling pad at this location.
 - The drill pad was constructed approximately 120 feet to the north of the adit and will be used to drill into the mine workings behind the blocked adit to explore water levels and conditions in the mine. The pad is located approximately 80 feet in elevation above the adits' existing drain pipe and 6 feet in elevation above the bottom of the Glory Hole. Based on visual observations that no water is present (nor has ever been observed) in the bottom of the Glory Hole, the static water level in the workings is below the drill pad elevation and a backflow preventer on the drill rig is not necessary.
 - Once EPA's Response Team has drilled into the adit and water levels behind the blockage have been confirmed, a submersible pump will be lowered into the well and used to dewater the workings to the maximum extent possible but to a level that is at least 2.5 to 3 feet. After pumping down the water levels, the portal blockage will be removed

from the top down. A sump pump may be placed inside the portal behind the blockage to continue pumping before the adit will be opened. All water will be passed through the two water management ponds which have a combined capacity of more than 200,000 gallons. Water stored within the ponds will be treated with caustic to drop heavy metals and discharged to Sih-mem Creek.

- Finally, a portal will be constructed to keep the adit clear of blockage, allow the free flow of adit discharge and prevent public entrance.

PLANNED ACTIVITIES

For the Operational Period 9, September 11 to 17, 2023, the following operations are planned:

1. Conduct a test of EPA's stakeholder notification system for the Site.
2. Complete improvements to the lower water detention pond.
3. Drill into and drain the adit. Note this activity was scheduled to begin on September 11, 2023, but the drilling team has been delayed. The best information that the Response Team currently has is that drilling will begin no later than September 14, 2023.
4. Upgrade the bridge/water crossing at Carpenter Creek.
5. If time allows, the Team will repair the toe of the two large fluvial tailings ponds at several locations along Carpenter Creek.

For additional information please visit the EPA Silver Dyke Adit and Drainage Site Response page: <https://response.epa.gov/silverdykeadit>



First retention pond directly below the adit.



Lower retention pond, capacity increased to hold over 160,000 gallons.



Road work to accommodate drill rig.