Opportunity for Public Comment on Proposed Plan for Interim Action

Nelson Tunnel/Commodore Waste Rock Superfund Site
September 2020

EPA ANNOUNCES PROPOSED PLAN

The public is invited to review and comment on this proposed plan for interim remedial action at the Nelson Tunnel/Commodore Waste Rock Superfund Site (the Site) located one mile north of the town of Creede in Mineral County, Colorado (see Figure 1 for a site location map).

The U.S. Environmental Protection Agency (EPA), in consultation with the Colorado Department of Public Health and Environment (CDPHE), has completed a Remedial Investigation and Focused Feasibility Study to prevent a sudden and large uncontrolled release of the mine-impacted water impounded within the Nelson Tunnel and associated workings. This proposed plan provides basic background information about the Site, describes the alternatives that were considered, identifies the preferred alternative, and summarizes the agencies' reasons for recommending the proposed interim action. EPA is the lead agency for cleanup and is supported by the United States Forest Service (USFS) and CDPHE.

The preferred alternative includes construction of an adit that intersects Nelson Tunnel, bypassing the Nelson Tunnel Portal Pool, and installation of a bulkhead to control flow from the Nelson Tunnel. In addition, a structure in the Commodore 5 level would be installed to control flow but would still allow access to the rehabilitated mine workings.

The Site is divided into two areas known as Operable Units. The Commodore Waste Rock Pile is operable unit 1 (OU1). The Nelson Tunnel is operable unit 2 (OU2) (see Figure 2). The focus of this proposed plan is to determine an interim action for OU2. Interim action is limited in scope and only addresses specific components of a site. An additional proposed plan will be distributed at a later date to determine a final remedy for OU2.

EPA is issuing this proposed plan as part of its public participation responsibilities under the federal Superfund law.

We want your input!

Public comment period:
September 29–October 30, 2020

During the comment period, EPA is accepting comments on this proposed plan, the Focused Feasibility Study and all supporting documents. Mail or email comments to:

Dania Zinner, Project Manager
U.S. EPA Region 8 (SEM-RB)
1595 Wynkoop Street
Denver, Colorado 80202
zinner.dania@epa.gov

Mark your calendars!

EPA and CDPHE are hosting a public meeting to present this proposed plan and accept formal public comment:

5:30–7 p.m. Tuesday, September 29, 2020

This meeting will occur via conference call with the option to participate by videoconference. Please call 303-312-7122 or email zinner.dania@epa.gov to RSVP for this meeting.

More information and the Administrative Record are available at EPA's Nelson Tunnel website: https://www.epa.gov/superfund/nelson-tunnel and in the site information repository at the Creede Town Hall.

SITE BACKGROUND

The Site is located in the San Juan Mountains in south central Colorado, one mile north and nearly 400 vertical feet above the town of Creede in Mineral County, Colorado (Figure 1). The Site consists of the abandoned Nelson Tunnel, which drains directly into West Willow Creek, and the Commodore Waste Rock Pile. The Site is approximately 9,175 feet above sea level in a canyon with steep, nearly vertical walls reaching roughly 10,600 feet.

Figure 1. Site Location Map

Site History

Mining in Mineral County started in 1876 but did not draw investors and was not highly profitable until 1890, spurred by discovery of the Solomon-Holy Moses Vein. This find increased interest in the Creede mining district, and more than 15 mines were subsequently developed within the Willow Creek Watershed. Silver was the primary mineral mined in Mineral County; however, significant amounts of gold, copper, lead, and zinc were also extracted.

The Nelson Tunnel/Commodore Waste Rock Site is located within the Commodore Mine complex. This complex includes several separate mines, with workings along the Amethyst Vein system.

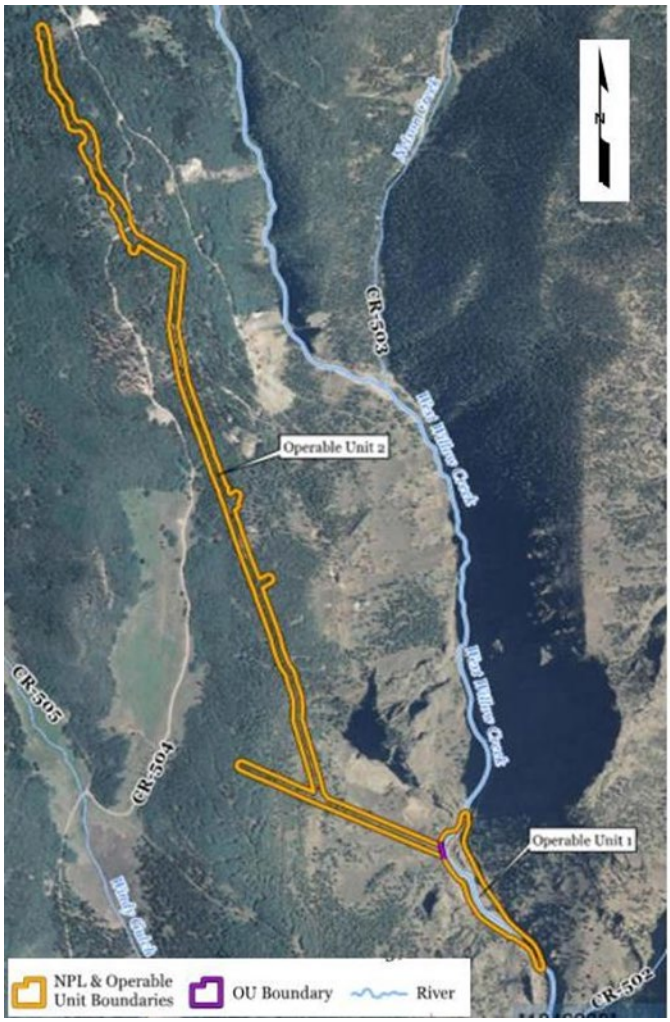

Figure 2. Superfund Boundary and Operable Unit Map

The Nelson Tunnel was constructed in three parts, the Nelson, the Wooster, and the Humphries (referred to collectively as the Nelson Tunnel), starting in the 1890's as a means to efficiently remove ore from the various mines along the Amethyst Vein system. Eventually, Nelson Tunnel was extended a total of 13,100 feet. The Nelson Tunnel provided both haulage and drainage for mines in the Amethyst Vein system. The Commodore 5 level adit was driven approximately 45 feet above the Nelson Tunnel system to access the same mines. The two adits are connected by vertical mine structures (winzes, raises, and shafts) and were constructed with different slopes such that the adits become closer in elevation further back in the drift.

Mining activities continued in the Nelson and Commodore 5 level workings until 1976. Inspections and data collected by the Colorado Division of Reclamation, Mining, and Safety (DRMS) starting in 2002 indicate a series of natural impoundments (collapses) in the Nelson Tunnel resulting in formation of three mine pools. The Commodore 5 level remains accessible; however, its structural integrity has been slowly deteriorating.

Figure 3 provides a plan-view of the Nelson Tunnel and Commodore 5 level, including intersecting vertical structures and the identified mine pools.

Studies indicate that groundwater enters the Commodore Mine complex workings via faults and fractures in bedrock. In addition, surface water is suspected or known to be entering mine shafts at various locations. The Nelson Tunnel discharges mine-impacted water directly to West Willow Creek, which then flows into the Rio Grande River downstream.

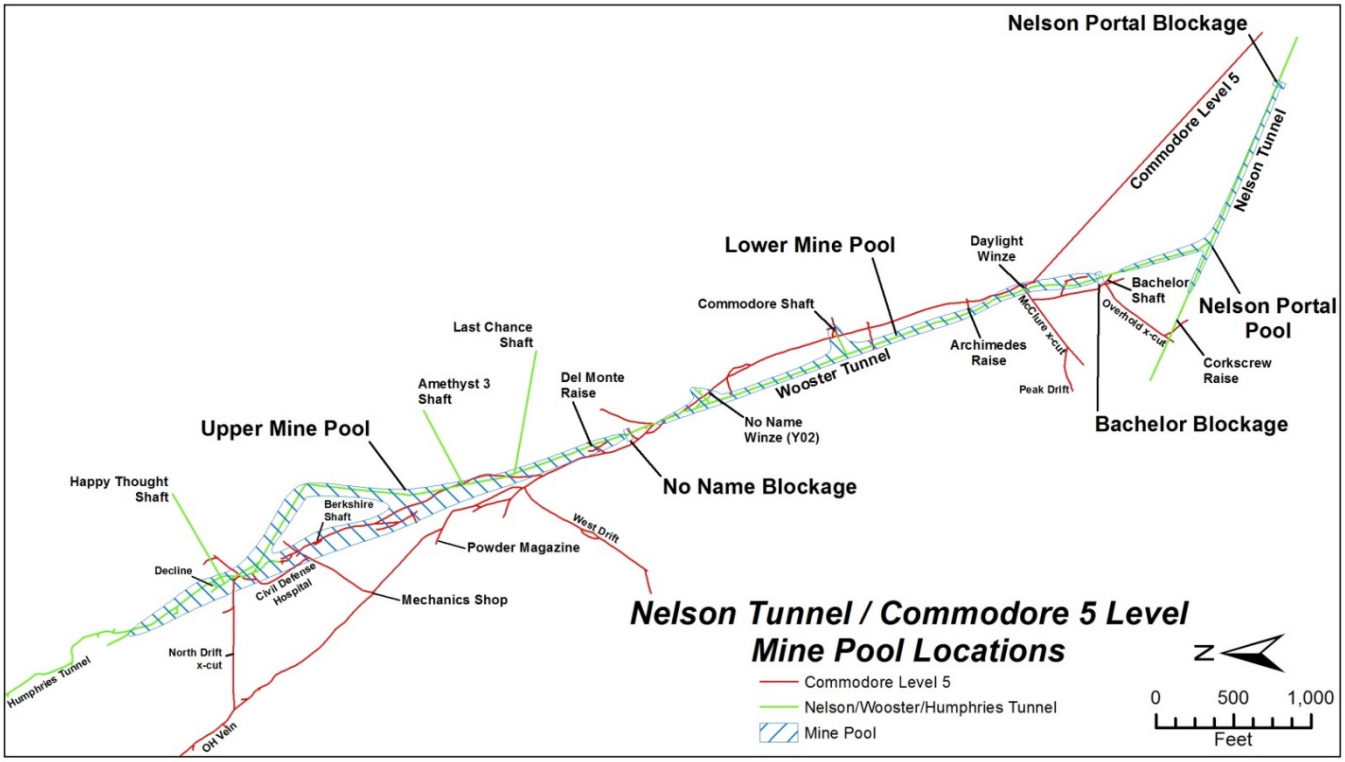

Figure 3. Depiction of Nelson Tunnel and Commodore 5 level workings and mine pools

Prior Cleanup Actions

Contamination of Willow Creek and its tributaries by mining related activities and waste has been documented for more than 35 years. In 1999, the Willow Creek Reclamation Committee (WCRC) was formed by Creede stakeholders to investigate the nature and extent of contamination originating in the watershed. Since that time, the WCRC and DRMS, in conjunction with other partners and donors, have utilized EPA grants known as non-point source funds and Brownfields to implement several cleanup projects in the watershed, stabilizing mine waste and tailings piles. Despite these efforts, the Nelson Tunnel portal discharge has been found to be the largest single source of contamination in Willow Creek.

2000–2007: The WCRC and DRMS investigated and rehabilitated portions of the Commodore Mine complex. During this period, much was learned about mine conditions, sources of inflows into the mine complex, and the feasibility of source control measures. Rehabilitation work included stabilization, cleanup, and improvements to ventilation. Investigations included inspections, historical research, tritium dating of mine waters, and a dewatering pump test study in 2007.

2008–2010: EPA conducted a removal action to stabilize the Commodore Waste Rock Pile (OU1) after a washout occurred in 2005. The Commodore Waste Rock Pile was graded and shaped to establish stable slopes, mine waste was removed from West Willow Creek, and approximately 2,000 feet of reinforced channel for the creek was constructed.

Due to adverse impacts of Nelson Tunnel discharge to water quality in Willow Creek and the Rio Grande River, the Site was placed on EPA's National Priorities List in September 2008.

2011–2019: EPA conducted a Remedial Investigation (RI) that was published in 2011. The RI included a human health risk assessment, an ecological risk assessment, sampling data for West Willow Creek and Willow Creek, and a description of blockages within the Nelson Tunnel. As work proceeded on the site-wide Feasibility Study and further investigations on possible hydrologic control remedy alternatives were conducted, the agencies identified the need for an interim action to mitigate the potential hydraulic hazards associated with the mine pools in the Nelson Tunnel. A RI addendum was released in 2019 summarizing data from additional studies since 2011.

2017–2019: EPA began developing a draft Focused Feasibility Study in 2017. The Focused Feasibility Study contains a detailed discussion of the Nelson Tunnel and the Commodore 5 level conditions, including a summary of an underground field visit in 2016 and a technical memorandum from DRMS regarding mine pool observations. The Focused Feasibility Study is issued to the public with this proposed plan.

2018–2020: Site inspections in recent years indicated that conditions in the mine complex required more immediate attention. Therefore, extensive rehabilitation of the Commodore 5 level and some associated drifts was completed during the 2018–2020 Time-Critical Removal Action (TCRA), with additional work planned for 2021. The rehabilitation work provides for medium-term (15- to 50-year design life) access for on-going inspection and characterization of conditions behind known blockages in the Nelson Tunnel. Once fully complete, rehabilitation will extend approximately 6,500 feet inby of the Commodore 5 portal, including shoring up openings and upgrading ladders to access the Nelson Tunnel.

In addition to maintaining access, the TCRA rehabilitation of the Commodore 5 level helps prevent the buildup of pressure against the blockage (No Name Blockage) that creates the Upper Mine Pool. Pressure relief is provided when Upper Mine Pool water flows into the Commodore 5 level through the Del Monte Raise, inby of No Name Blockage, and returns to the Nelson Tunnel level through the No Name Winze, which is outby of No Name Blockage. This is an important aspect of the TCRA rehabilitation work, because if further collapses in Commodore 5 level prevent water from bypassing No Name Blockage and returning to the Nelson Tunnel level, a buildup of pressure in the Upper Mine Pool could potentially result in a blowout of No Name Blockage. This could result in a large, uncontrolled release of mining-impacted water from Nelson Tunnel.

SITE CHARACTERISTICS AND NATURE AND EXTENT OF CONTAMINATION

Nelson Tunnel Mine Pools

Currently, the natural impoundments in the Nelson Tunnel are considered stable. During the 2007 dewatering study, the volume of the largest of the three mine pools, the Upper Mine Pool, was calculated. The Upper Mine Pool is estimated at 19 million gallons. The Lower Mine Pool and the Nelson Tunnel Portal Pool each exceed approximately one million gallons. See Figure 3 for the mine pool map. Refer to the *Technical Memorandum Re: Commodore-Nelson Tunnel Mine Pool Observations* from DRMS, November 6, 2015, included as an attachment to the Focused Feasibility Study, for further detail. Figure 4 shows water flowing within the Nelson Tunnel.

Water levels in the mine pools have been monitored periodically for over 18 years. In recent years, deterioration of the Commodore 5 level has been observed. If roof fall, collapse, or blockage develops in the Commodore 5 level that creates a barrier to water flow, additional pressure could build on the impoundment holding back the Upper Mine Pool in the Nelson Tunnel. Additionally, a geologic event, such as an earthquake, could also change the stability of the system. Therefore, it is difficult to predict future long-term stability.

If a large uncontrolled flow from Nelson Tunnel were to occur, it could cause the migration of metals contamination further downstream of the Site more than currently occurs. Metals contamination would migrate directly as dissolved elements in the water, as well as in sediments that could be carried farther downstream by a larger flow rate. Recontamination of the reclaimed floodplain south of Creede could occur. A sudden release coincident with obstructions in the concrete creek channel through town could result in the banks of that channel overtopping and flooding of the local area. Additionally, the physical safety of individuals recreating on West Willow Creek or the upper section of Willow Creek could be impacted in a high flow rate event.

Nelson Tunnel Discharge

The Nelson Tunnel discharges an average of approximately 365 gallons per minute (calculated from the past five years of flow data). Based on monitoring of the discharge from 1999 through 2016, the discharge is acidic and contains high concentrations of heavy metals. Table 1 summarizes the acidity (pH) and select heavy metal data collected from Nelson Tunnel discharge. Figure 6 is a view of the Nelson Tunnel Portal.

Table 1. Nelson Tunnel Discharge

Discharge	Average Concentration
pH	4.3
Cadmium	181 µg/l
Copper	179 µg/l
Lead	998 µg/l
Zinc	50,200 µg/l

µg/l = micrograms per liter

Surface Water Quality in Willow Creek Watershed

Metal concentrations in Willow Creek exceed State of Colorado surface water quality standards for copper, cadmium, lead, and zinc. Several sources other than the Nelson Tunnel discharge may be contributing metal loads to West Willow and Willow creeks, including the Commodore Waste Rock Pile, sources on East Willow Creek, and other tailings in the floodplain south of town. Table 2 compares average metal loads from Nelson Tunnel discharge over the last eight years to the load of select metals in Willow Creek, measured just above the confluence with the Rio Grande River. Because surface water flow varies significantly during snowmelt, the data is divided into low flow (from August through March) and high flow (from April through July).

Table 2. Comparison of Nelson Tunnel and Willow Creek Metal Loads (pounds per day)

Metal	High Flow		Low Flow	
	Nelson Tunnel	Willow Creek	Nelson Tunnel	Willow Creek
Cadmium	0.82	2.20	0.52	0.93
Copper	1.32	1.47	0.30	0.27
Lead	3.5	3.5	6.3	1.3
Zinc	203	382	202	223

Surface Water Quality in the Rio Grande River

The Rio Grande River between the confluence with Willow Creek and the confluence with South Fork of the Rio Grande River is designated by the CDPHE Water Quality Control Commission as Segment 4a. Based on collected data, cadmium and zinc concentrations in the Rio Grande River downstream of the confluence with Willow Creek exceed current Colorado surface water quality standards in 91 percent and 86 percent of the measurements, respectively. Willow Creek is believed to contribute most of the cadmium and zinc load to Segment 4 of the Rio Grande River.

SCOPE AND ROLE OF INTERIM ACTION

The focus of this proposed Interim Action is to improve the underground workings in Nelson Tunnel and Commodore 5 Level to allow for inspection and maintenance, and to control the flow from the Nelson Tunnel, averting the potential for large uncontrolled flows from Nelson Tunnel.

The proposed Interim Action addressing OU2 is not the final remedy for the Site and, though not intended to improve the quality of the water discharged from Nelson Tunnel, some incremental improvement may result. EPA continues to evaluate and explore alternatives to improve water quality for a final remedy.

Settlement money has been received by EPA and CDPHE from two potentially responsible parties (PRPs) that covers a portion, but not all, of the past and anticipated future costs for cleanup at the Site. Investigations into other viable PRPs are ongoing by the Site's legal team including EPA, the State, and the U.S. Department of Justice. Any funding needed for the Site cleanup not obtained from the PRPs will be sourced from federal and state funds.

SUMMARY OF SITE RISKS

Human Health Risk

Significant long-term direct ingestion of water from the Nelson Tunnel discharge, West Willow Creek or Willow Creek is unlikely and is not considered an exposure pathway. Absorption through the skin and other incidental contact exposures are not considered significant exposure pathways.

Figure 4. Water flowing in Nelson Tunnel

Figure 5. Large Roof Fall North of the Commodore Shaft

Ecological Risks

To evaluate potential risk to aquatic and land life forms, EPA performed a baseline ecological risk assessment in 2011. Ecological risks to fish and aquatic invertebrates, which are organisms living in the sediment and water (such as insects, snails, and worms) were assessed in the Willow Creek watershed and in the Rio Grande River. Risks to mammals and birds were also assessed in the Willow Creek watershed.

The weight of evidence indicates ecological risks above a level of concern for aquatic invertebrates (insects, snails, worms, etc.) and some animals from exposure to water and aquatic plants in Willow Creek downstream of Nelson Tunnel. Risks in Willow Creek were driven by a variety of metals including cadmium and zinc. Risks to most animals are hypothetical given that their food source (fish) is not present in Willow Creek.

The 2011 Baseline Ecological Risk Assessment for the Site concluded that the weight of evidence indicates ecological risks above a level of concern for aquatic invertebrates, trout, and aquatic birds that eat insects in the Rio Grande River downstream of Willow Creek. However, a sediment survey of the Rio Grande River below the confluence with Willow Creek indicates only mild mine water-related impacts on these organisms based on a model for assessing populations in creeks and rivers. In addition, a 2012 fish toxicity testing showed no significant acute toxicity occurred to young rainbow trout exposed to water samples collected downstream of the confluence with Willow Creek. Study of samples collected at the Rio Grande surface water monitoring stations from 2014-2017 indicated that aquatic communities were not impaired.

REMEDIAL ACTION OBJECTIVE

Remedial action objectives provide a general description of what a cleanup will accomplish and are used to develop the cleanup options described in the next section. The objective is:

Prevent a sudden and large uncontrolled release of the mine-impacted water impounded within the Nelson Tunnel and associated workings. Such a release would result in further migration of contaminated water and sediments.

The remedial action objectives consider how a cleanup can be protective of human health and the environment based on property types and current and reasonably anticipated future land use.

It is the agencies' current judgment that the Preferred Alternative identified in this proposed plan is necessary to protect human health and the environment from threatened releases of metals contaminants into the environment due to a potential large release from the Nelson Tunnel.

SUMMARY OF REMEDIAL ACTION ALTERNATIVES

The detailed analysis of the remedial alternatives can be found in the focused feasibility study for this Interim Action. (See page 12 for information on obtaining the feasibility study). A summary of the remedial alternatives follows.

Alternative 1–No Further Action

Superfund law requires that EPA provide a "No Action" alternative as a baseline for comparison for the other proposed alternatives. Under Alternative 1, EPA would take No Further Action to prevent a

sudden release of the impounded mine-impacted water from Nelson Tunnel.

Estimated Total Capital Cost: $0

Estimated Total Operation and Maintenance (O&M) Cost (30-year, present worth cost): $0

Estimated Construction Time: Not applicable

Alternative 2–Selective Rehabilitation of Mine Workings and Periodic Inspections/Monitoring

Alternative 2 is similar to Alternative 1 in that no action is performed to mitigate the threat of sudden releases. Alternative 2 provides for safe access to Commodore 5 level to observe and monitor known collapses and mine pool levels. The Commodore 5 level was rehabilitated to the Del Monte Raise during the 2018-2020 TCRA. Rehabilitation is currently being extended approximately 500 feet further inby (Segment 6). This work is scheduled to be completed in 2021. This alternative provides inspection and maintenance of the rehabilitation work for a period of 30 years. In addition, it maintains the ability of Commodore 5 level to provide pressure relief for the Upper Mine Pool.

Estimated Total Capital Cost: $239,000

Estimated Total O&M Cost (30-year, present worth cost): $1,411,000

Estimated Construction Time: 1 year

Alternative 3–Clear Nelson Tunnel Portal Pool, Tunnel Rehabilitation, Install Bulkhead in Nelson Tunnel and Flow-Control Structure in Commodore 5 Level

Alternative 3 is focused on installing bulkheads in the Nelson Tunnel and the Commodore 5 level to control discharge. This alternative would provide protection against a sudden uncontrolled release from Nelson Tunnel, meeting the remedial action objective.

Alternative 3 includes the following remedial components:

- Dewatering the Nelson Tunnel Portal Pool and removal of the blockage creating the pool;
- Rehabilitation of Nelson Tunnel to the location where bulkhead construction is planned;
- Installation of a flow-control bulkhead in Nelson Tunnel to protect against a sudden uncontrolled release from Nelson Tunnel;
- Installation of an accessible flow-control structure in the Commodore 5 level to protect against a sudden uncontrolled release through this level.

Estimated Total Capital Cost: $13,313,000

Estimated Total O&M Cost (30-year, present worth cost): $1,776,000

Estimated Construction Time: 2 years

Alternative 4–Drive New Drift to Intersect Nelson Tunnel, Tunnel Rehabilitation, Install Bulkhead in Nelson Tunnel and Flow-Control Structure in Commodore 5 Level

Alternative 4 is similar to Alternative 3 in that the focus is on bulkhead installation to control discharge, except a new adit would be driven generally parallel to the Nelson Tunnel to bypass the Nelson Tunnel Portal Pool. This will eliminate the need to dewater the Nelson Tunnel Portal Pool, remove the blockage, and rehabilitate the Nelson Tunnel where the blockage occurred. This alternative would provide protection against an uncontrolled release from the Nelson Tunnel, meeting the remedial action objective.

Alternative 4 includes the following remedial components:

- Installation of a new adit that intersects Nelson Tunnel, to bypass the Nelson Tunnel Portal Pool;
- Rehabilitation of the Nelson Tunnel from the bypass adit connection to the location where bulkhead construction is planned;
- Installation of a flow-control bulkhead in the Nelson Tunnel to protect against a sudden uncontrolled release through Nelson Tunnel;
- Installation of an accessible bulkhead flow-control structure in the Commodore 5 level to protect against a sudden uncontrolled release through this level.

Estimated Total Capital Cost: $10,318,000

Estimated Total O&M Cost (30-year, present worth cost): $1,411,000

Estimated Construction Time: 2 years

Alternative 5–Dewatering of Stored Mine Pool Water, Rehabilitation and Removal of Blockages

Alternative 5 differs from Alternatives 3 and 4 in that bulkheads to control flow would not be installed. Instead, the three known Nelson Tunnel pools would be dewatered and blockages removed to re-establish gravity drainage without water being retained behind mine collapses. While Alternatives 3, 4 and 5 would all require temporary water treatment, the volume and therefore, expense for water treatment is much greater for Alternative 5. This alternative would meet the RAO to prevent an uncontrolled release from Nelson Tunnel; however, there is no long-term measure to

prevent future collapses inby of the rehabilitated section of Nelson Tunnel and the Commodore 5 level from creating mine pools and subsequent uncontrolled releases of impacted water.

Alternative 5 includes the following remedial components:

- Dewatering each of the Nelson Tunnel pools and removal of the blockages creating the pools;
- Conveyance of the mine pool water to a temporary treatment plant located south of Creede;
- Rehabilitation of Nelson Tunnel from the portal to past blockages (approximately 5,800 feet).

Estimated Total Capital Cost: $55,237,000

Estimated Total O&M Cost (30-year, present worth cost): $2,822,000

Estimated Construction Time: 5 years

EVALUATION OF ALTERNATIVES

Nine evaluation criteria (see inset on page 8) are used to evaluate the different remedial alternatives in order to select a remedy. This section of the proposed plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. A summary of the comparison is provided in Table 3. The "Detailed Analysis of Alternatives" can be found in the feasibility study. The "No Further Action" alternative (Alternative 1) is screened through the criteria to provide a baseline for comparison. Based on the results of the Focused Feasibility Study, EPA determined that Alternative 2 would be screened out for evaluation as a viable alternative because it will not meet the remedial action objectives defined for this interim action and much of this work has already been completed by the Time-Critical Removal Action.

Overall Protection of Human Health and the Environment

The evaluation of this criterion focuses on the ability of the alternative to protect human health and the environment from a sudden large release. Each of the proposed alternatives, except for Alternative 1 (No Further Action), provide this protection and each are designed to be consistent with a range of future final actions that will provide protection of human health and the environment. However, because of the potential for blockages in mine workings that will not be rehabilitated, Alternative 5 will provide protection in the short term; whereas Alternatives 3 and 4 provide long term protection from a sudden and large uncontrolled release.

EPA EVALUATION CRITERIA

Overall Protection of Human Health and the Environment evaluates whether an alternative eliminates, reduces, or controls threats to human health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations and other requirements or if a waiver is justified.

Long-term Effectiveness considers the ability to maintain protection of human health and the environment over time.

Reduction in Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates the use of treatment to reduce the harmful effects of site contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the alternative, including the relative availability of goods and services.

Cost includes estimated capital and annual O&M costs. Cost is calculated as the present worth cost, which is the total cost of an alternative over time in terms of today's dollars. Feasibility study cost estimates are expected to be within the range of +50 to −30 percent.

State Acceptance considers whether the State of Colorado agrees with EPA's analyses and the preferred alternative.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments provided to this proposed plan are an important indicator of community acceptance.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

ARARs are separated into three categories, 1) Chemical- Specific, 2) Location-Specific, and

3) Action-Specific. This Interim Action is not intended to bring the Site into compliance with State of Colorado surface water quality standards (Chemical-Specific standards) but is focused on mitigating further migration of contaminants from a large release. Therefore, the alternatives are not evaluated for compliance with the Chemical-Specific Colorado surface water quality standards.

Alternatives 3, 4 and 5 would increase water flow from the Nelson Tunnel during construction while managing water around the construction or rehabilitation areas. Managed water during the construction would be treated to prevent further migration of contamination and prevent further degradation of existing water quality within West Willow.

Treated water may not meet all surface water quality standards; therefore, Interim Measures Waivers will be included in the Interim Record of Decision, waiving the Chemical-Specific and Action-Specific Colorado surface water quality standard ARARs relating to discharges during construction. Meeting surface water quality standards for the construction discharge is possible but is judged infeasible because it would be logistically difficult due to the limited space available for construction activities, would provide limited benefit to the environment because treatment would be temporary, and would substantially increase costs. More significantly, the time required to construct and operate a full-scale system that can provide a higher level of water treatment will significantly delay achievement of the RAO to prevent a sudden and large uncontrolled release.

It is expected that Location-Specific ARARs would be met by each of the alternatives. Because Alternatives 3, 4 and 5 would require Interim Measures Waivers for the Chemical-Specific and Action-Specific water quality ARARs during construction, they are ranked moderate for compliance with ARARs. Alternatives 1 and 2 would comply with ARARs associated with the RAO of this response action, since no water management during construction is required, the Action-Specific surface water quality standards also do not apply. Therefore, these alternatives are ranked high in this category.

Long-Term Effectiveness

Long-term effectiveness and permanence refer to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once the RAO has been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

Alternative 1–No Further Action does not meet the RAO or provide reduction in the risk of a large release, thus is ranked low. Alternative 5 provides some degree of long-term effectiveness through inspection and maintenance and is ranked moderate. Alternatives 3 and 4 are equally effective in addressing the long-term risk of a sudden and large uncontrolled release from the Nelson Tunnel and Commodore 5 level and are ranked high.

Reduction of Toxicity, Mobility, and Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. The RAO for this Interim Action cannot be met through a treatment remedy, thus each of the alternatives is ranked low for this criterion.

Figure 6. Mine discharge emerging from the collapsed Nelson Tunnel Portal

Short-Term Effectiveness

Short-term effectiveness addresses the period needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until the RAO is achieved.

Alternative 1 does not meet the RAO, thus is ranked low. Alternatives 3 and 4 could be completed in approximately two years and are comparable in reducing the short-term threat of a sudden release and short-term risks to workers, primarily associated with mine rehabilitation, underground mining, and bulkhead installation. These risks can be mitigated by stringent adherence to worker safety regulations and practices. Both of these alternatives are ranked high for short-term effectiveness.

Alternative 5 is estimated to require three to five years

to complete and would require comparatively greater impact on the community because siting of the treatment plant needed to manage water during dewatering may require several property agreements to convey the water from the mine workings to a treatment plant south of Creede. Alternative 5 would likely provide short-term protection against a large release, but would take longer to implement, thereby increasing risks to site workers during implementation. For these reasons, Alternative 5 is ranked moderate for short-term effectiveness.

Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Implementation of Alternatives 3 through 5 requires mine stabilization. Materials, equipment, and workforce, as well as qualified engineering construction firms are available within the region to complete the work. Defining the level of stabilization required for underground workings is technically challenging due to uncertainties in rock conditions. Alternatives 3 and 5 require dewatering of mine pools. Dewatering prior to removing blockages will present technical challenges to implement safely.

Alternative 3 requires significant stabilization and dewatering efforts, including the blockage and mine pool near the Nelson Tunnel Portal. For these reasons, implementation is comparatively ranked moderate for implementability.

Alternative 4 requires the least amount of stabilization and dewatering, relying on excavation of a new adit. Excavation will require the use of explosives, which could affect public access to the county road along West Willow Creek during periods when detonation is occurring. Overall, Alternative 4 is ranked high for implementability.

Table 3. Comparison of Alternatives

Evaluation Criterion	Alternative				Notes About Rankings
	1	3	4	5	
Overall Protection of Human Health and the Environment	○	⊕	⊕	●	Alternatives 3 and 4 are the most effective source control alternatives and provide the greatest protection to surface water quality.
Applicable or Relevant and Appropriate Requirements (ARARs)	⊕	●	●	●	Alternatives 3 through 5 will require Interim Measures Waivers to allow treated water to be discharged without fully meeting surface water quality standards.
Long-Term Effectiveness	○	⊕	⊕	●	Alternatives 3 and 4 will meet the RAO by installing bulkheads and other flow control devices; whereas Alternative 5 will remove existing blockages but is not expected to provide long-term protection from sudden releases.
Reduction of Toxicity, Mobility, and Volume through Treatment	○	○	○	○	The RAO of this Interim Action does not include long-term measures to improve surface water quality.
Short-Term Effectiveness	○	⊕	⊕	●	The schedule for completing construction is approximately two years for both Alternatives 3 and 4.
Implementability	⊕	●	⊕	○	Alternative 4, which includes constructing a bypass adit to avoid unstable portions of Nelson Tunnel, is considered easier to implement than Alternative 3.
Cost	⊕	●	●	○	Cost for Alternatives 3 and 4 are similar. In comparison, the cost for Alternative 5 is nearly 3 times greater than estimated costs for Alternatives 3 and 4.
State Acceptance	○	●	⊕	○	The State of Colorado concurs with the selection of Alternative 4 as the Preferred Alternative.
Community Acceptance					To be fully assessed after the public comment period.

○ Low Ranking ● Moderate Ranking ⊕ High Ranking

Alternative 5 is by far the most difficult to implement due to the need to remove and dewater all three blockages and mine pools. In addition, greater water treatment capacity is needed to treat mine pool waste. This will likely require a pipeline that would cross a number of properties with different owners to convey water to a remote treatment plant. Acquisition or lease of property upon which to construct and operate the plant would also be required. Water rights issues with respect to volume and point of discharge of the treated water may also increase difficulties with implementing this alternative. Alternative 5 is ranked low for implementability.

Cost

Alternatives 1 and 2 are the lowest cost and are rated high. Alternative 5 is the most expensive with a total cost of over $58 million and is rated low. Alternative 3 and 4 have similar costs, in the range of $10 million to $15 million, and are rated moderate.

State Acceptance

The State of Colorado concurs with the selection of the Alternative 4 as the Preferred Alternative.

Community Acceptance

Community acceptance of the alternatives will be evaluated after the public comment period ends and will be described in the Interim Record of Decision.

SUMMARY OF EPA'S PREFERRED ALTERNATIVE

Alternative 4, Drive New Drift to Intersect Nelson Tunnel, Tunnel Rehabilitation, Install Bulkhead and Flow-Control Structure, is the Preferred Alternative. This alternative is recommended because it will meet the RAO more effectively than the other alternatives.

Because the Preferred Alternative would require more than one construction season to implement it would likely be completed in phases. Construction of a bypass adit that intersects Nelson Tunnel and bypasses the Nelson Tunnel Portal Pool would be constructed during the first phase. During the next construction phase, the bulkhead in Nelson Tunnel would be installed. In the final phase, an accessible flow-control structure in the Commodore 5 level would be installed.

Based on the information currently available, EPA, as lead agency, and support agencies CDPHE and USFS, believe the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Preferred Alternative can change in response to public comment or new information.

EPA and CDPHE expect the Preferred Alternative to meet the statutory requirements of CERCLA 121(b) to the extent practicable for an interim action. This Interim Action is protective of human health and the environment with respect to the remedial action objective and is cost effective. Chemical-Specific and Action-Specific surface water quality standards for this limited scope action would be waived. Subsequent actions are planned to address fully the threats posed by mine-impacted water discharging from the Nelson Tunnel. Because this is an Interim Action, review of this Site and of this remedy will be ongoing as EPA, CDPHE, and USFS continue to develop final remedial alternatives for the Site.

GLOSSARY OF MINING TERMS

Adit–A horizontal passage from the surface by which a mine is entered, with only one entrance.

Drift–A horizontal passage underground that follows the vein or ore deposit.

Inby–Toward the working face, or interior, of the mine.

Outby–Farther from the working face or toward the mine entrance.

Portal–The structure surrounding the immediate entrance to a mine; the mouth of an adit or tunnel.

Raise–A vertical or near-vertical opening driven upward form a level to connect with the level above, or to explore the ground for a limited distance above one level.

Shaft–A vertical or near-vertical opening through mine strata used for ventilation or drainage and/or for hoisting of personnel or materials; typically connects the surface with underground workings.

Tunnel–A horizontal, underground passage, entry, or haulage-way, that is open to the surface at both ends.

Winze–A vertical or near-vertical opening sunk from inside a mine for connecting with a lower level or of exploring the ground for a limited depth.

Opportunities for Community Participation

Public Meeting

EPA will host a public meeting via conference call with the option to participate by video conference. Please email zinner.dania@epa.gov or call 303-312-7122 to RSVP for the meeting.

Nelson Tunnel Superfund Site
Virtual Public Comment Meeting

Tuesday, September 29, 2020
5:30–7:00 p.m.

If you like, you can provide your comment orally at the public meeting, which will be recorded.

Documents

The Remedial Investigation Report, Focused Feasibility Study Report, and Administrative Record are available for viewing at EPA's Nelson Tunnel website (https://www.epa.gov/superfund/nelson-tunnel) or at one of the document repositories listed below.

Creede Town Hall
2223 N. Main Street
Creede, CO 81130
M–F, 8 a.m.– 4:00 p.m. 719-658-2276
Appointment is required.

EPA Superfund Records Center
1595 Wynkoop Street
Denver, CO 80202
To request copies of administrative record documents call:
303-312-7273 or
800-227-8917 ext. 312-7273 (toll free in CO, MT, ND, SD, UT, WY only)

Contacts

If you have questions, please feel free to contact:

Dania Zinner, Project Manager
U.S. EPA, Region 8 (SEM-RB)
1595 Wynkoop Street Denver, CO 80202
303-312-7122
zinner.dania@epa.gov

Ross Davis, Environmental Protection Specialist
CDPHE
4300 Cherry Creek Drive South
Denver, CO 80246-1530
303-693-3362
ross.davis@state.co.us

Martha Williamson
Rio Grande National Forest
Divide District Ranger
13308 West Hwy 160
Del Norte, CO 81132
719-657-6007
martha.williamson@usda.gov

Public Comments and Extensions

EPA will host a public comment period from September 29–October 30, 2020. The comment period may be extended 30 days with a formal request to EPA. Comments can be submitted by mail, email, or at the public meeting to:

Dania Zinner, Project Manager
U.S. EPA, Region 8 (SEM-RB)
1595 Wynkoop Street Denver, CO 80202
zinner.dania@epa.gov, 303-312-7122