Final Restoration Plan and Environmental Assessment for the Tiger and Dinero Tunnels Restoration

Prepared for:

U.S. Department of the Interior
U.S. Fish and Wildlife Service
U.S. Bureau of Land Management
U.S. Bureau of Reclamation

State of Colorado
Department of Natural Resources
Department of Public Health and Environment
Department of Law

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Trustees:

Department of the Interior
- U.S. Fish and Wildlife Service
- U.S. Bureau of Land Management
- U.S. Bureau of Reclamation

State of Colorado
- Department of Natural Resources
- Department of Public Health and Environment
- Department of Law

Legal Authority:

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended), 42 U.S.C. § 9601, *et. seq*.

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Lead Federal Agency for Restoration Plan: U.S. Department of the Interior (Region 6, U.S. Fish and Wildlife Service)

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1. Introduction and Summary

This Restoration Plan and Environmental Assessment (RP/EA) has been prepared by federal and state natural resource trustees to address public losses caused by surface water and groundwater injuries resulting from releases of hazardous substances to and from the California Gulch Superfund Site ("the Site"). This RP/EA pertains to restoration projects the trustees would undertake at abandoned mine sites in the Lake Fork watershed that would serve as compensation for injuries to surface water and groundwater at the California Gulch site. A separate RP/EA will be issued in the future to address injuries to surface water resources in the Arkansas River and injuries to terrestrial resources. The Trustees decided to develop the RP/EA presented here separately from the future RP/EA for other resources because (1) the Lake Fork restoration projects proposed in this plan had already been through a substantial public scoping and participation process led by the U.S. Bureau of Land Management (BLM); (2) the Lake Fork mine sites have similar natural resource injuries as those that occurred at the California Gulch site; (3) work done in the Lake Fork watershed will benefit the Arkansas River downstream of its confluence with the Lake Fork; (4) the Lake Fork projects had partial funding already in place from partner agencies but needed an additional source of funding to allow construction activities to begin in spring 2009; and (5) the proposed projects are located in physically isolated areas in the Lake Fork watershed and will not interfere with any restoration projects proposed in a future RP/EA.

The natural resource trustee agencies involved in the development of this plan are the U.S. Department of the Interior (DOI) and the State of Colorado, specifically represented by the U.S. Fish and Wildlife Service (USFWS), BLM, and the U.S. Bureau of Reclamation (BOR) on behalf of DOI, and the Colorado Department of Natural Resources (DNR), Colorado Department of Public Health and Environment (CDPHE), and Colorado Department of Law (DOL) on behalf of the State of Colorado (collectively, the "Trustees").[1]

Each Trustee is authorized to act on behalf of the public to evaluate potential injuries to natural resources and associated losses of ecological services resulting from releases of hazardous substances at the Site. Authority to act on behalf of the public is given to trustees in CERCLA

1. Natural resources trustees are designated pursuant to Section 107(f) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC § 9607(f), Section 311 of the Clean Water Act (CWA), 33 USC § 1321, and other applicable law, including Subpart G of the National Contingency Plan (NCP), 40 CFR §§ 300.600–300.615. The DOI authorized official ("AO") at this site is the Region 6 Regional Director for the USFWS, and represents the interests of the Department, including all affected Bureaus. The State trustees, designated pursuant to Section 107 (f), are the Executive Director of CDPHE, the Attorney General of Colorado, and the Director of Reclamation, Mining, and Safety within DNR.

[42 USC §§ 9601 *et seq.*] and the CWA [33 USC §§ 1251 *et seq.*]. Actions to restore, replace, or acquire the equivalent of lost resources are the primary means of compensating the public for injuries to natural resources under these authorities.

The Site encompasses more than 15 square miles, including the town of Leadville, Colorado, and surrounding areas where historic mining activities took place. The Site contains more than 2,000 mine-waste piles, as well as the Yak Tunnel which discharges drainage from numerous underground mines into California Gulch (CDPHE, No date). Heavy metals and acid released at or from the Site as a result of historic mining activities are CERCLA hazardous substances (see 42 USC §§ 9601 *et seq.*) and have caused injuries to natural resources. Because of this extensive contamination, the Site was placed on the National Priorities List (NPL) in September 1983. Emergency response actions and remediation by the U.S. Environmental Protection Agency (EPA) began in 1986 and continue to this day.

The Trustees, through the issuance of a preliminary estimate of damages (Industrial Economics, 2006), determined that releases of hazardous substances from the Site have resulted in injuries to surface water, terrestrial, and groundwater resources. This restoration plan focuses specifically on projects that would compensate for injuries to surface water and groundwater in California Gulch, which is a tributary to the Arkansas River and receives water from throughout the mining district, including Oregon Gulch, Stray Horse Gulch, the Yak Tunnel water treatment plant, and Starr Ditch. Surface water flow in upper California Gulch is intermittent, occurring as a result of snowmelt runoff and after high-intensity precipitation events. Flow in the lower California Gulch below the Yak Tunnel water treatment plant is perennial (Industrial Economics, 2006).

Lake Fork is located outside of the Site and is unaffected by California Gulch pollution. The proposed restoration projects described here are located at abandoned mine sites in the Lake Fork Watershed (Figure 1), which have been and continue to be sources of heavy metals and acid drainage to surrounding areas and to the downstream Arkansas River Watershed. The projects restore surface water and groundwater services similar to those lost at California Gulch. No private responsible parties capable of performing cleanup or restoration activities have been identified; therefore, the projects likely would not be implemented without the help of natural resource damages funding.

Resurrection Mining Company[2]; Newmont USA Limited; and ASARCO LLC have agreed to fund restoration to resolve their liabilities for natural resource injuries at the Site. The proposed restoration projects will be funded from the settlement funds received from these responsible parties. Additional restoration projects also will be funded out of these settlements and will be described in a future restoration plan that will address other injured resources, including injuries to aquatic resources in the Arkansas River.

2. Resurrection Mining Company is wholly owned by Newmont USA Limited.

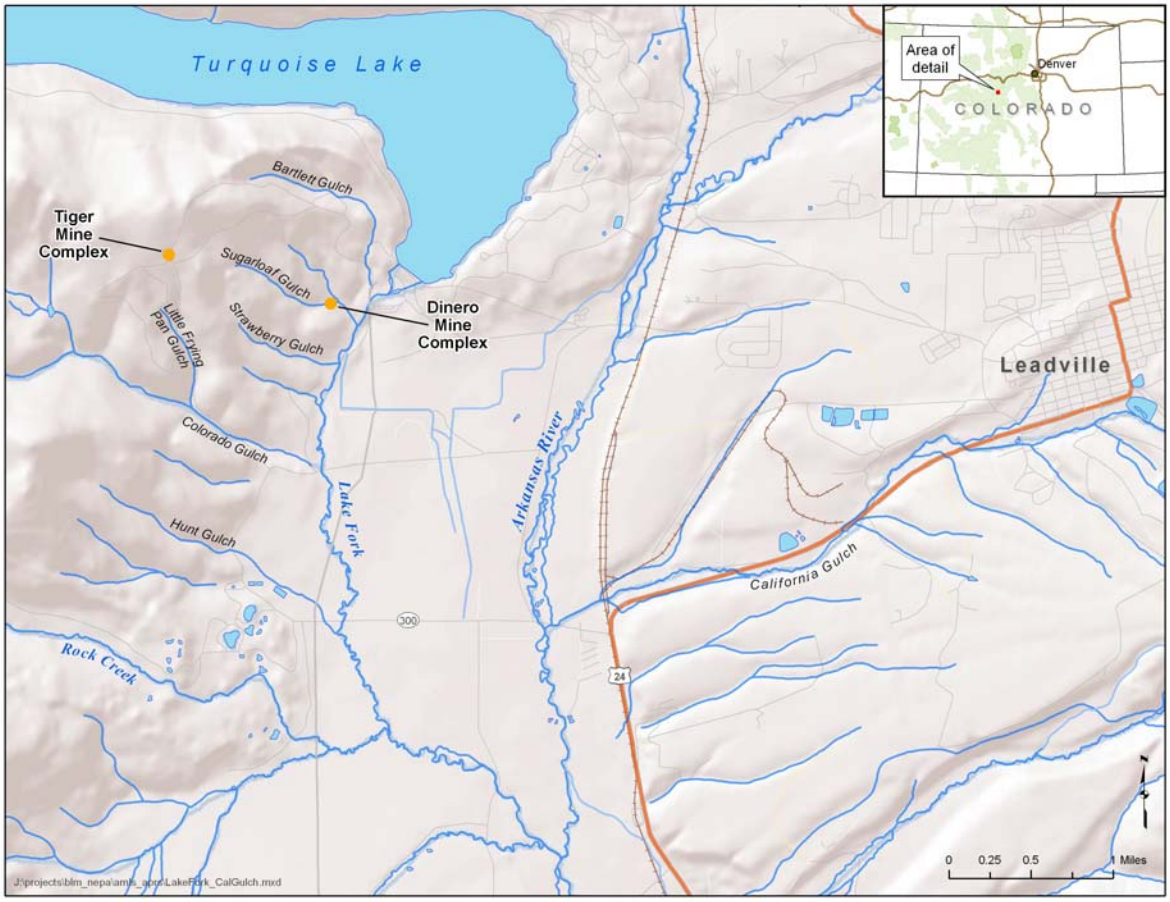

Figure 1. Overview map showing location of the Tiger and Dinero mine complexes in relation to California Gulch.

1.1 Trustee Responsibilities under CERCLA and the National Environmental Policy Act

The purpose of this RP/EA is to inform members of the public and solicit comments on the restoration actions proposed to compensate for those injuries and associated lost services. The RP/EA also serves as an EA pursuant to the National Environmental Policy Act (NEPA) [42 USC §§ 4321 *et seq.*] and the regulations guiding its implementation at 40 CFR §§ 1500 *et seq*. This plan describes the purpose and need for the proposed restoration actions, the restoration alternatives considered, including a no-action alternative, and the potential impact of individual and cumulative restoration actions on the quality of the physical, biological, and cultural environment.

This document also serves as the RP for implementing the selected alternative, pursuant to the natural resource damage assessment (NRDA) regulations. Under the regulations, the alternative selected in the RP should ensure that recovered damages are used to undertake feasible, safe, and cost-effective projects that address injured natural resources; consider actual and anticipated conditions; and are consistent with applicable laws and policies. Moreover, the RP/EA identifies the preferred alternative and describes how settlement monies received will be spent to achieve restoration goals.

1.2 Summary of Settlement

Resurrection Mining Company and Newmont USA Limited have agreed to pay $10.5 million to settle allegations that the companies injured natural resources (under the NRDA provisions of CERCLA) as a result of discharges of hazardous substances from historical mining operations at the California Gulch Superfund Site. In addition, the Trustees have a $10 million uncontested, unsecured claim against ASARCO LLC in bankruptcy proceedings, with the actual payout to be determined by the bankruptcy court.

A recent Memorandum of Understanding (MOU) among the trustee agencies stipulates that natural resource damage funds received will be used to restore natural resources in the upper Arkansas River watershed, in accordance with federal law. The money received will allow the Trustees to work together to restore the kinds of natural resources that were injured by releases of hazardous substances.

2. Purpose and Need for Restoration

This section describes the purpose and need for restoration to address losses to natural resources caused by the releases of hazardous substances at and from the Site. This restoration plan focuses on projects that will address injuries to surface water and groundwater resources in California Gulch through restoration of similar resources in an off-site location (the Lake Fork watershed); a subsequent restoration plan will focus on projects addressing injuries to other resources. As discussed previously, the Trustees determined in their preliminary estimate of damages that surface water and groundwater resources in California Gulch are injured, and restoration is required to compensate the public for these injuries (Industrial Economics, 2006).

2.1 Summary of Release History and Resulting Public Losses

The California Gulch Superfund Site is a large site including more than 15 square miles in and around the town of Leadville, Colorado. The Site was placed on the NPL in September 1983.

Extensive historic mining activities at the Site have resulted in past and ongoing releases of heavy metals and acid into California Gulch. In particular, the Yak Tunnel, which was constructed to de-water mines in the area, was a significant source of contamination to California Gulch from the time of its construction in 1895 until the Yak Tunnel water treatment plant began operation in 1992. Before construction of the treatment plant, more than 200 tons of metals were discharged into California Gulch each year by the Yak Tunnel (Industrial Economics, 2006).

Surface water in California Gulch exceeds aquatic injury thresholds for zinc and cadmium (Industrial Economics, 2006). This contamination has resulted in the nearly complete loss of a biological community in California Gulch. Benthic macroinvertebrates are severely reduced in number and diversity compared to reference locations. Sampling in 1989 and 1990 also found no fish in the lower perennial portion of California Gulch. Metal concentrations in groundwater wells along California Gulch have consistently exceeded groundwater criteria (Tetra Tech/RMC, 2004, as cited in Industrial Economics, 2006). Injuries to surface water and groundwater in California Gulch are expected to continue into the foreseeable future.

Evaluation of surface water and groundwater injury in California Gulch is complicated by the fact that California Gulch includes both losing reaches, where surface water migrates into groundwater, and gaining reaches, where groundwater migrates into surface water. Thus, contaminated water could move between groundwater and surface water several times while moving downstream from upper California Gulch to the Arkansas River (Industrial Economics, 2006). Because of this complexity, the Trustees evaluated injuries to California Gulch surface water and groundwater as a single interconnected system.

2.2 Restoration Goals

The purpose of the proposed restoration actions is to compensate the public through environmental restoration for injuries to natural resources that have been caused by releases of hazardous substances into the environment. As outlined under Section 107(f)(1) of CERCLA and specified in the Trustee's MOU, natural resource damage settlements will only be used to restore, replace, or acquire the equivalent of natural resources injured, destroyed, or lost as a result of the release of hazardous substances.

Accordingly, this RP/EA has been developed to select restoration projects designed to compensate the public for injuries to water resources in California Gulch. The NRDA activities undertaken by the Trustees are distinct from the removal and remediation actions (termed "response actions") that have been and continue to be conducted by EPA or CDPHE. Response actions have the objective of protecting human health and the environment by controlling exposure to released hazardous substances. Restoration actions are designed to compensate the

public for injuries by restoring, rehabilitating, replacing, or acquiring the equivalent of the injured resources.

The Trustees favor "in-kind" restoration, which means that the restoration projects focus on restoring the same types of resources as the ones that were injured. The Trustees intend to identify restoration projects that will compensate the public with the same type and quality of resources and services that were lost. These actions make the public whole by providing compensation for lost natural resources and associated ecological services. The restoration projects proposed in the Lake Fork drainage are expected to reduce or remove the injuries caused by heavy metals and acid drainage both locally at the mine sites and downstream in the Upper Arkansas watershed. In addition, because response actions at California Gulch are ongoing, the Trustees have chosen to focus on restoration alternatives in other locations in the Upper Arkansas watershed that will not conflict with, or be put at risk by, any planned or proposed response actions.

2.3 Need for Restoration

The proposed restoration actions are needed to restore water resources equivalent to those injured by releases of hazardous substances to California Gulch. Based on the recommendations set forth in this RP and input from the public, the Trustees will select the preferred restoration alternative.

2.4 Compliance with Other Authorities

The following environmental laws, regulations, and executive orders may affect completion of the restoration projects. Compliance with these authorities was considered as part of the restoration planning process, and the proposed restoration projects are consistent with these acts.

2.4.1 Environmental protection

National Environmental Policy Act

NEPA requires that federal agencies consider the environmental impacts of proposed actions and reasonable alternatives to those actions. The AO will determine, based on the facts and recommendations in this document and input from the public, whether this EA supports a "Finding of No Significant Impact" (FONSI), or whether an "Environmental Impact Statement" (EIS) will need to be prepared.

Clean Water Act

The CWA is intended to protect surface water quality, and regulates discharges of pollutants into waters of the United States. The proposed restoration projects will not create new discharges and will not actively manage existing discharges; they will not, therefore, require permitting under the CWA.

Federal Land Policy and Management Act

The Federal Land Policy and Management Act of 1976, as amended, 43 USC §§ 1701-1782, established the BLM mandate of multiple-use for BLM lands and sets forth the principles of sustainable land management for BLM. The proposed projects comply with BLM land management policy and guidance.

Endangered Species Act

The Federal Endangered Species Act of 1973, as amended, 16 USC §§ 1531 *et seq.*, was designed to protect species that are threatened with extinction. It provides for the conservation of ecosystems upon which these species depend and provides a program for identification and conservation of these species. Federal agencies are required to ensure that any actions are not likely to jeopardize the continued existence of a threatened or endangered species. The following threatened (T) and endangered (E) species are known to occur in Lake County, Colorado: Canada lynx (*Lynx canadensis*) (T), Greenback cutthroat trout (*Oncorhynchus clarki stomias*) (T), Gunnison's prairie dog (*Cynomys gunnisoni*) (Candidate), Penland alpine fen mustard (*Eutrema penlandii*) (T), and Uncompahgre fritillary butterfly (*Boloria acrocnema*) (E). The areas potentially affected by the proposed restoration actions are not known to provide core habitat for any of these threatened or endangered species (L. Archuleta, USFWS, personal communication, 4/25/2008).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 as amended, 16 USC §§ 703-712, protects all migratory birds and their eggs, nests, and feathers and prohibits the taking, killing, or possession of migratory birds. The proposed restoration actions would not result in the taking, killing, or possession of any migratory birds.

2.4.2 Cultural preservation

National Historic Preservation Act

The National Historic Preservation Act of 1966, as amended, 16 USC §§ 470 *et seq*. (NHPA), is intended to preserve historical and archaeological sites. The Dinero Tunnel and the Tiger Complex are eligible for the National Register of Historic Places (BLM, 2006a, 2006b). Compliance with the NHPA is discussed further in Section 4.4.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979, as amended, 16 USC §§ 470aa-mm, was enacted to secure the protection of archaeological resources and sites on public lands. A permit is required to excavate or remove any such archaeological resource. If such resources are identified in the areas affected by the proposed restoration projects, a permit will be obtained prior to disturbance.

2.4.3 Other laws

The Occupational Health and Safety Act (OSHA) of 1970, as amended, 29 USC §§ 651 *et seq*., governs the health and safety of employees from exposure to recognized hazards, such as exposure to toxic chemicals, excessive noise, mechanical dangers, and unsanitary conditions. All work conducted on the proposed restoration actions will comply with OSHA requirements.

3. Proposed Restoration Action/Preferred Alternative and Alternatives

The primary goal of the proposed restoration actions is to compensate for surface water and groundwater resources injured, and services lost, in California Gulch due to releases of hazardous substances at and from the Site. This section describes the criteria for identifying and selecting alternatives, and then presents the alternatives reviewed.

3.1 Criteria for Identifying and Selecting the Proposed Restoration Action/Preferred Alternative and Alternatives

In evaluating and selecting restoration projects, the Trustees have identified the factors listed in Table 1 for consideration.

Table 1. Summary of Trustee criteria for evaluating restoration projects

Threshold acceptance criteria
1. Project must restore, replace, or acquire natural resources, not merely human services.
2. Restoration projects must be subject to a reasonable degree of Trustee management, control, and monitoring.
3. Project must have a reasonable likelihood of success. The project should be technically feasible and viable.
4. Project must comply with laws and be protective of health and safety.
5. Project must be generally acceptable to the public.
Project evaluation criteria
1. Projects that are consistent with existing state, regional and local resource management and development plans will be strongly preferred.
2. Projects that provide higher flows of services throughout the project lifetime will be preferred. It is preferable and more cost-effective for projects to provide higher levels of near-term benefits as compared to projects that require protracted periods to realize benefits. Projects that provide long-term sustainable service flows are also preferred.
3. Projects with less long-term Operation and Maintenance (O & M) will be preferred. Projects with significant long-term O & M will only be considered if the costs are assumed by other parties and the Trustees are assured that O & M will be adequately carried out for as long as necessary.
4. Projects that are likely to benefit more than one resource and more services will be preferred.
5. Projects that can be reasonably monitored and have benefits that can be measured and verified will be preferred.
6. Projects that provide actual resource improvements will be preferred over projects that entail only conservation of open space, unless development threats are imminent or the conservation opportunity is of an advantageous scale or timing.
7. Projects that provide a high ratio of expected benefits compared to expected long-term costs for planning, implementation, and O & M will be preferred. Cost-effectiveness may be assessed relative to other projects that benefit the same resources; more cost-effective projects will be preferred.
8. Projects will be preferred if they are not likely to be funded through other mechanisms, or if implementation of the project would free restoration funding sources to finance other restoration projects.
9. Projects will be preferred if they leverage damage recoveries to match other funding sources and thereby enable projects to be larger or more comprehensive in scope.

3.2 Description of the Alternatives

3.2.1 No action/natural recovery alternative

A no-action alternative is required under NEPA [40 CFR § 1502.14(d)]. The selection of this alternative would mean that no actions would be taken by the Trustees to restore injured natural resources, and that existing natural resource losses would continue to occur. Natural recovery of contaminated surface water and groundwater at California Gulch is not expected to occur within the foreseeable future (i.e., the next 100 years). Natural recovery of contaminated surface water and groundwater at the proposed restoration locations (Tiger Tunnel and Dinero Tunnel) also is not expected to occur within the foreseeable future. This alternative may be used as a benchmark to evaluate the comparative benefit of other actions. Because no action is taken, this alternative also has no cost.

3.2.2 Proposed action/preferred alternative

The proposed action/preferred alternative is the alternative that the Trustees believe would best compensate the public for injuries to natural resources in California Gulch. This alternative consists of two projects that address acid-mine drainage sources and pathways to natural resources in the upper Arkansas River drainage: breaking hazardous substance pathways to natural resources at the Tiger Tunnel and at the Dinero Tunnel.

Tiger Tunnel waste rock dumps and acid-mine drainage pathway elimination project

The proposed Tiger Tunnel waste rock dumps and acid-mine drainage pathway elimination project addresses acid-mine drainage flowing from the Tiger Tunnel and two associated mine-waste piles [Tiger Complex 7 (TC-7) and Tiger Complex 8 (TC-8)] into the East Fork of Little Frying Pan Gulch, which is a tributary to Colorado Gulch, the Lake Fork, and ultimately the upper Arkansas River. The site is located approximately 5 miles west of Leadville, Colorado (BLM, 2006a).

Drainage from the Tiger Tunnel site releases acid and metals to Little Frying Pan Gulch (BLM, 2006a). During high flow, the Tiger Tunnel and associated mine-waste piles contribute approximately 23% of the zinc load to Colorado Gulch; Colorado Gulch in turn contributes approximately 80% of the zinc load to the Lake Fork (CMC, 2008).

Natural resources are injured at the Tiger Tunnel site. Water quality within Colorado Gulch and the Lake Fork below Colorado Gulch exceeds aquatic life standards for metals, including cadmium, copper, iron, lead, and zinc. Biological surveys indicate adverse impacts to benthic macroinvertebrates and fish within the Lake Fork watershed (CMC, 2001). Additional secondary

impacts may also be occurring to species higher-up in the aquatic food chain, including birds and mammals, if the impacts from acid-mine drainage on macroinvertebrates and fish are severe enough to affect the prey base (BLM, 2006a). Recreational users may be exposed to metals in the area via direct contact with mine-waste and water and through accidental or deliberate ingestion of contaminated water at the site (BLM, 2006a).

The project, as described in the Draft "Engineering Evaluation and Cost Analysis" (EE/CA; BLM, 2006a), includes the following actions:

Install hydrologic and run-on controls to divert clean surface and shallow groundwater. Control structures will be constructed to divert clean water away from waste piles located near the streambed. Water flowing downhill would be directed to natural runoff channels at the edges of the site. Diverting sources of clean surface water and shallow groundwater above the tunnel is expected to decrease the amount of water that feeds the Tiger Tunnel through shallow groundwater pathways. These diversions are expected to decrease discharge from the Tiger Tunnel. A description of these types of diversions is provided in Colorado Department of Natural Resources (2002).

Relocate and cap piles in an on-site repository. Waste piles TC-7 and TC-8 will be relocated to an on-site repository. The repository is estimated to cover approximately 2 acres and will be constructed with hydrologic controls to divert water around the waste material. After construction, the area will be capped, seeded, and protected with an environmental covenant that will (1) prevent uses of the property incompatible with containment of the mine waste, and (2) ensure the long-term effectiveness of the project.

An additional action at the site, constructing a treatment system for residual acid-mine drainage, is not being funded from settlement funds received from responsible parties to resolve their liabilities for injuries at the California Gulch Superfund Site. Instead, this portion of the project is being funded by grant money received by Colorado Mountain College. This separately funded project will increase the effectiveness of the other project actions by controlling any residual acid-mine drainage with a series of open limestone channels and settling ponds as well as construction of a passive sulfate-reducing bioreactor to remove residual zinc.

This project will reduce the exposure of natural resources to hazardous substances by decreasing the amount of water (run-on, snowmelt, rain, and groundwater) in contact with contaminants in the tunnel and waste piles. It also will decrease the overall metals load to Colorado Gulch, the Lake Fork, and the Arkansas River (BLM, 2006a). Finally, the project will have the additional benefit of reducing the potential human use of natural resources exposed to hazardous substances.

The estimated total cost for this project is $858,750 (see BLM, 2006a, with costs updated per personal communication of Dan Grenard, BLM, to Diana Lane, 3/31/2008 and personal communication of Laura Archuleta, USFWS, to Diana Lane, 4/2/2009).

Dinero Tunnel acid-mine drainage pathway elimination project

The proposed Dinero Tunnel acid-mine drainage pathway elimination project addresses acid-mine drainage from the Dinero Tunnel into Sugarloaf Gulch, a tributary to the Lake Fork, and ultimately the upper Arkansas River. The tunnel is also located approximately 5 miles west of Leadville, Colorado. Acid-mine drainage from the Dinero Tunnel significantly impacts downstream waters, including a wet meadow/beaver pond complex, where manganese and iron have precipitated.

Previous restoration work has been conducted at the site, but impacted surface waters still do not meet water quality standards (BLM, 2006b). In 2004, waste piles at the Dinero Tunnel complex were relocated to two engineered on-site repositories that are performing well. Acid-mine drainage is currently treated by a series of settling ponds and limestone lined channels; however, iron, manganese, and zinc remain elevated above thresholds protective of aquatic life in surface waters influenced by the site (BLM, 2006a). Loss of habitat and food supply would be expected to affect the food chain, i.e., macroinvertebrates, fish, birds, and mammals. Recreational users (e.g., campers, hikers, and fishermen) may be exposed to hazardous substances via direct contact and possible ingestion of contaminated water, sediment, and fish. Residential areas are located within ¼ mile of the Dinero Tunnel area (BLM, 2006a).

The Dinero Tunnel has historically experienced blowouts, which occur when a temporary blockage in the tunnel is washed out by the resulting pressure buildup. These large and unpredictable events expel sludge, rocks, and acid-mine drainage which can move contaminants farther downstream and potentially resuspend the precipitated iron and manganese in the wetland complex.

The project, as described in the EE/CA (BLM, 2006b), includes the following actions:

Install a bulkhead within the Dinero Tunnel. A steel reinforced concrete bulkhead will be installed at 1,250 feet within the Dinero Tunnel. The bulkhead will reduce the volume of acid-mine drainage and the risk of blowouts from the tunnel. The bulkhead will be equipped with a valve to allow adjustments of water level within the tunnel if necessary. Water from the mine tunnel (the mine pool) may surface uphill of the tunnel opening following installation of the bulkhead. However, these springs are expected to have good water quality because (a) the anoxic environment will not leach metals as rapidly as the previous oxidizing environment, (b) metals generated in the upper portion of the mine pool tend to stratify to the bottom, and (c) movement of water within the mine pool is expected to occur above the sulfide ore zones.

If seeps or springs with poor water quality surface uphill of the tunnel, the bulkhead valve can be adjusted to allow water to again flow out through the tunnel. Releasing water through the bulkhead will lower the water level in the mine pool and should eliminate the uphill seeps or springs. In this case, the bulkhead will still have accomplished the important function of eliminating the risk of blowouts from the tunnel that could carry large volumes of contaminated sludge into the Lake Fork.

Monitoring of mine pool elevation and water quality, including any seeps or springs, will be funded for three years by the BLM, at an expected cost of up to $25,000 per year. Plans are being developed to continue monitoring for an additional 10 years and possibly beyond. Funds for additional monitoring are expected to come from a variety of sources and could include the EPA's CWA Section 319 Nonpoint Source Pollution Program, the BLM, other EPA sources, and other Trustee agencies. The cost of the Dinero Tunnel bulkhead along with three years of monitoring will be approximately $930,000 (see BLM, 2006b, with costs updated per personal communication of Dan Grenard, BLM, to Diana Lane, 3/5/2008).

An additional action considered at the site would be a water treatment system for the residual acid-mine drainage. This system would not be funded from natural resource damages settlement funds. The treatment system would consist of a sulfate-reducing bioreactor that would treat any acid-mine drainage not captured by the bulkhead and additional acid-mine drainage from other nearby sources. This project would reduce the exposure of natural resources to hazardous substances by decreasing the release of acid-mine drainage from the Dinero Tunnel and surrounding sources. It will also decrease the overall metals load to Sugarloaf Gulch, the Lake Fork, and the Arkansas River (BLM, 2006b). Funding for this portion of the project is not yet in place.

Summary of restoration actions by alternative

Table 2 presents a comparison of the no-action alternative and the proposed action. The no-action alternative does not restore injured surface water and groundwater. The proposed action would control acid-mine drainage that is exposing and injuring aquatic natural resources in Lake Fork Creek and other tributaries. While both the no-action and proposed action alternatives are technically feasible, the no-action alternative does not compensate the public for injuries to surface water and groundwater resources that were caused by releases of hazardous substances at and from the California Gulch Superfund Site.

Table 2. Comparison of alternatives

Characteristic	No action	Proposed action
Technically feasible	Yes	Yes
Meet federal and state requirements pertaining to water quality and wetlands	No	Yes
Reduce releases of hazardous substances to the Lake Fork watershed	No	Yes
Reduce biota exposure to acid-mine drainage	No	Yes
Cost	$0	$1.8 million[a]

a. See Table 4 for breakdown of funding sources.

3.3 Other Alternatives Considered

The Trustees considered other alternatives, including containment of waste rock at the Griffin Mine in St. Kevin's Gulch, which drains to Tennessee Creek in the upper Arkansas River basin.

The Trustees also considered but did not carry forward other alternatives for addressing acid-mine drainage at the Dinero and Tiger Tunnel sites. These alternatives are described and evaluated in the EE/CA documents prepared for the Tiger Tunnel (BLM, 2006a) and the Dinero Tunnel (BLM, 2006b). These alternatives included actions such as installation of self-powered lime dispensing treatment systems at the Tiger and Dinero tunnels and installation of an underground flow-through limestone drain at the Dinero Tunnel. These other alternatives were evaluated thoroughly (BLM, 2006a, 2006b) but were not selected as preferred alternatives based on an analysis of their expected effectiveness, feasibility, and cost.

4. Affected Environment

As required by NEPA, this section briefly describes the physical, biological, and cultural environment that will be affected by the proposed restoration activities at the Dinero and Tiger tunnels.

4.1 Physical Environment

Proposed restoration activities at the Dinero and Tiger tunnels will occur in the Lake Fork watershed, located near the San Isabel National Forest on the east side of the Continental Divide, in Lake County, Colorado. Lake Fork Creek is located on the east side of the Sawatch Range in the Colorado Rocky Mountains at the upper reaches of the Arkansas River valley. Flow in Lake

Fork Creek is regulated by Sugarloaf Dam, which controls the outflow of water from Turquoise Lake. Lake Fork Creek flows for approximately 4.5 miles from Sugarloaf Dam until its confluence with the Arkansas River. Tributaries to Lake Fork Creek include Sugarloaf Gulch, Strawberry Gulch, and Colorado Gulch (Figure 1).

The Tiger Tunnel site is located at an elevation of approximately 10,600 feet within the East Fork of Little Frying Pan Gulch, a tributary to Colorado Gulch, on a mixture of federal and private land. The Dinero Tunnel site is located at an elevation of approximately 9,900 feet and discharges to Sugarloaf Gulch. It is located on private land, but the BLM has undertaken cleanup activities at the site because of its impact on adjacent and downstream public lands administered by BLM. Both sites are approximately 5 miles west of the town of Leadville, Colorado.

The Tiger Tunnel and Dinero Tunnel sites are part of the Sugarloaf mining district, which makes up 6 square miles of the Lake Fork watershed. Known mining areas include the Tiger Tunnel, the Dinero Mine and Tunnel, the Nelson Tunnel, and many others. The Tiger Tunnel extends northward into Sugarloaf Mountain where it contacts the Tiger-Shields Vein and the Tiger Shaft. The Dinero Tunnel extends approximately 3,000 feet from the surface to the Dinero Shaft.

Nearly all productive veins in the area were discovered in the 1880s, and the period of maximum output for most of them was prior to 1893. The veins were mined primarily for silver, but gold, zinc, and lead were also found in lesser quantities. Currently, there is no active mining in the watershed.

4.2 Biological Environment

The Dinero and Tiger Tunnel sites are located in a high-elevation montane environment typical of the Rocky Mountains. Both sites are dominated in upland areas by lodgepole pine, with some spruce and fir. Typical understory species include sagebrush, aspen, and kinnikinnick. Birds commonly found in this forest type include the gray jay, mountain chickadee, red-breasted nuthatch, ruby-crowned kinglet, hermit thrush, pine grosbeak, and pine siskin (Eric Brekke, BLM, personal communication, 4/21/2008).

The Dinero Tunnel site also includes a riparian area along Lake Fork Creek and a 13-acre wetland that is perched along Lake Fork Creek and fed by surface runoff and groundwater flow. A high elevation fen is found along the north side of the wetland. Herbaceous species, such as sedges and mesic grasses, dominate the wetland. In the dryer edges of the wetland, willows and mesic sedges and grasses are dominant. In the riparian area, mixed conifers dominate the east bank while willows, mesic sedges, and grasses dominate the west bank (BLM, 2006b).

In high elevation riparian habitat, bird diversity is typically low but the density of nesting birds can be high in dense willow thickets. Typical bird species in riparian habitat include the broad-tailed hummingbird (*Selasphorus platycercus*), dusky flycatcher (*Empidonax oberholeri*), yellow warbler (*Dendroica petachia*), MacGillivray's warbler *(Oporornis tolmiei*), Wilson's warbler (*Wilsonia pusilla*), Lincoln's sparrow (*Melospiza lincolnii*), song sparrow (*Melospiza melodia*), white-crowned sparrow (*Zonotrichia leucophrys*), and fox sparrow (*Passerella iliaca*) (Eric Brekke, BLM, personal communication, 4/21/2008).

Natural resources at both the Dinero and Tiger Tunnel sites have been injured by acid-mine drainage. At the Dinero Tunnel site, acid-mine drainage from the tunnel flows directly into the wetland at the site and then into Lake Fork Creek. Because of the influx of acid-mine drainage into the wetland, the wetland has "toxic metal precipitates" and a pH that ranges from 3.3 to 3.9 (BLM, 2006b). Lake Fork Creek also is injured from acid-mine drainage from the Dinero Tunnel. Lake Fork Creek does not meet Colorado water quality standards for several metals and is considered an impaired waterbody. An inventory of trout habitat in the Lake Fork by the Colorado Division of Wildlife (CDOW) found that physical habitat was adequate but water quality impairments resulted in minimal aquatic biomass (BLM, 2006b).

At the Tiger Tunnel site, injured terrestrial natural resources include devegetated areas on and around the mine-waste piles. Approximately 1 acre of terrestrial and riparian resources that are currently covered by mine-waste piles TC-7 and TC-8 will be restored through implementation of the preferred restoration actions. Injured aquatic areas include the East Fork of Little Frying Pan Gulch, where the waste pile known as TC-8 is located within the streambed. The injured area downstream of the site includes approximately 0.9 miles of Colorado Gulch downstream of Little Frying Pan and 4.3 miles of Lake Fork Creek that will benefit from reductions in metals and acid loading. Water quality sampling has demonstrated that "the east fork of the Little Frying Pan is the major contributor of surface water metals loading to the Little Frying Pan, Colorado Gulch, and Lake Fork during high flow" (Thompson, 2005).

4.3 Threatened and Endangered Species

As described previously, the Threatened and Endangered species known to occur in Lake County, Colorado are the Canada lynx (*Lynx canadensis*) (T), Greenback cutthroat trout (*Oncorhynchus clarki stomias*) (T), Penland alpine fen mustard (*Eutrema penlandii*; T), and Uncompahgre fritillary butterfly (*Boloria acrocnema*; E). Gunnison's prairie dog (*Cynomys gunnisoni*) is a candidate for listing. The areas potentially affected by the proposed restoration actions are not known to provide core habitat for any of these species. Canada lynx could potentially use the project sites as a small part of a travel corridor. The proposed restoration actions are unlikely to disrupt travel patterns of the Canada lynx because undisturbed forested

areas surrounding the project sites would provide alternative routes (L. Archuleta, USFWS, personal communication, 4/25/2008).

In addition, any disturbances resulting from the construction activities at the restoration sites would be of relatively short duration (1–3 years). These restoration projects would provide long-term benefits to habitat for any Threatened and Endangered species by reducing exposure to hazardous substances.

4.4 Cultural Environment

A cultural resource inventory was conducted for the Dinero Tunnel and Tiger Tunnel sites by the consulting firm Mountain States Historical, under contract to the BLM. The survey found that these sites were among the most important mining operations in the Sugarloaf mining district. Established in 1879, the district encompassed Sugarloaf Mountain, Colorado Gulch, and the immediate area. The district enjoyed peak production between 1879 and around 1886, fell into depression, and then experienced a revival that began during the late 1890s and ended around 1906, with some activities at the Tiger Tunnel continuing into the 1920s. Both sites include historic archaeological features and artifacts that represent the mine's surface facilities and the history of operations at the sites.

The Dinero Tunnel site was designated as a historic site (registered as Site 5LK1584), with a total of 27 different features distributed over 7.6 acres. The site was found to be eligible for the National Register of Historic Places because of its direct association with events and trends that were important to the Leadville area and the State of Colorado, its association with innovative engineering practices, and because it is a sound archaeological example of a large, complex tunnel mine developed with formal engineering.

The Tiger Tunnel site was designated as a historic site (registered as Site 5LK1809), with 31 historic archaeological features distributed over 4.3 acres. Remnants include surface facilities, cabins for the mine workers, and four privy pits with buried historic archaeological deposits. The site was found to be eligible for the National Register of Historic Places because of its direct association with events and trends that were important to the Leadville area and the State of Colorado; because it was a sound archaeological example of a large, complex tunnel mine developed with formal engineering; because the residential complex and associated artifacts reflected the accommodations, lifestyle, and demography of typical 1880s miners on Colorado's frontier; and because the residential complex was likely to yield information important to the understanding of Colorado history upon further study.

4.5 Native American Religious Concerns

Although aboriginal sites are present in the vicinity of the area of potential effect, no properties of traditional religious and cultural significance were located during the cultural resources inventory at the Tiger Tunnel and Dinero Tunnel sites (see Section 4.4). There is no other known evidence that suggests the project area holds special significance for Native Americans.

The area of potential effect comprises historic mines and related facilities. As a result, the natural environment has been severely impacted and any aboriginal remains that might have been present before the mines were constructed likely were obliterated during the mining era.

5. Environmental Consequences of the Alternatives

5.1 Evaluation of the Alternatives Considered and Their Effects

This section presents the expected impacts of the no-action alternative and the proposed action alternative. A summary of the impacts is presented in Table 3.

5.1.1 Evaluation of the no-action alternative

Habitat impacts

Under this alternative, no habitats would be preserved, restored, or enhanced beyond what agencies and organizations such as the Lake Fork Watershed Working Group are already doing in the area with limited existing resources. Aquatic resources in Lake Fork Creek would continue to be impaired because of continued discharge of metals from the Dinero and Tiger Tunnel sites. At the Dinero Tunnel site, wetland and riparian natural resources would continue to be exposed and injured from acid-mine drainage. At the Tiger Tunnel site, upland resources would continue to be exposed and injured by waste rock piles. Ephemeral stream resources in East Fork Little Frying Pan Gulch would continue to be exposed and injured by the Tiger Complex mine-waste pile in the middle of the Gulch. Aquatic natural resources in Colorado Gulch would continue to be exposed and injured by metals loading from Little Frying Pan Gulch. The public would not be compensated for injuries to natural resources from the release of hazardous substances into the environment.

Table 3. Comparison of impacts by alternative

Category of impact	No-action alternative	Proposed action/preferred alternative
Habitat impacts	No additional habitats preserved, restored, or enhanced. Continued impairment of aquatic, riparian, and upland resources.	Aquatic, wetlands, and riparian habitat would recover from metals loading. Approximately 2 acres of upland habitat at the Tiger Tunnel site needed for the on-site repository would be converted from forest to grassland habitat.
Biological impacts	Continued ongoing adverse impacts to fish and wildlife.	Improvements to fish and wildlife resulting from a decrease in metals loading to their habitats.
Cultural resource impacts	No impacts to historic properties.	Adverse effects to cultural resources would occur and would be mitigated by additional research and creation of an archeological context document to identify, understand, and evaluate the significance of other mining resources in the area.
Native American religious concerns	No impacts expected.	No impacts expected.
Environmental justice	No benefits to Leadville residents, including minority and low-income populations.	Benefits to Leadville residents, including minority and low-income populations, from improved fishing opportunities.
Socioeconomic impacts	No positive indirect economic impacts on the local economy.	Construction activities would generate short-term economic benefits. Improved fishing conditions would generate long-term economic benefits.
Indirect impacts	No indirect impacts.	Indirect beneficial impacts expected through improved habitat for fish, birds, and wildlife in the project areas.
Cumulative impacts	Cumulative impacts would be negative because of continued degradation of aquatic, wetland, and riparian habitat from releases of metals and acid-mine drainage at the Tiger and Dinero Tunnel sites.	Cumulative impacts expected to be beneficial through long-term benefits to water quality, fish, and wildlife in and around the project sites.

Biological impacts

Fish and wildlife would not benefit if the no-action alternative were chosen. The existing impairment of Lake Fork Creek would continue, with populations of insects and fish below the level expected given the physical habitat conditions. Wildlife that depend on clean water and on insects and fish as sources of prey would continue to be impacted by the habitat impairment in Colorado Gulch and Lake Fork Creek. Wildlife that use the wetland and riparian resources at the Dinero Tunnel site would also continue to be adversely impacted.

Cultural resource impacts

Under the no-action alternative, there would be no impacts to the historic properties at the Tiger and Dinero Tunnel sites. For the Tiger Tunnel site, there would be no mitigation actions, which means that current understanding of the greater Tiger-Shields mining operation would not be enhanced through additional research.

Native American religious concerns

No sites that might hold special significance for Native Americans were found during cultural resource surveys at the Site. Therefore, no impacts are expected under the no-action alternative or the proposed alternative.

Environmental justice

Under the no-action alternative, there would be no benefit to the residents of Leadville, including minority and low-income populations in the area, through improvement of fishing opportunities in Colorado Gulch and Lake Fork Creek.

Socioeconomic impacts

Under the no-action alternative, there would be no positive indirect economic impacts on the local economy. Construction activities would not occur and would not generate additional economic activity in the area.

Cumulative impacts

Under the no-action alternative, cumulative impacts to the environment would be negative. Aquatic habitat would continue to be degraded on Colorado Gulch and Lake Fork Creek. Wetland and riparian habitat would continue to be degraded at the Dinero Tunnel site. Fish and wildlife would not benefit from improved aquatic, wetland, and riparian habitat. Local populations would not benefit from improved fishing opportunities and increased construction activities in the area. Future generations would not have access to an improved environment.

5.1.2 Evaluation of the proposed action/preferred alternative

The Trustees' preferred alternative includes pathway elimination restoration actions at the Dinero Tunnel and Tiger Tunnel sites to reduce the acid-mine drainage emanating from these sites and reduce metals loading into Lake Fork Creek.

Habitat impacts

Under this alternative, aquatic habitat in Little Frying Pan Gulch, Colorado Gulch, and Lake Fork Creek would recover from the metals loading that currently takes place as a result of acid-mine drainage from the Dinero and Tiger Tunnel sites. Wetland and riparian habitat at the Dinero Tunnel site also would recover under the preferred alternative. Terrestrial habitat at the Tiger Tunnel site that is currently impacted by the waste rock piles would recover. However, a small area (approximately 2 acres) of currently uninjured terrestrial habitat at the Tiger Tunnel site would be cleared of trees to allow construction of the on-site repository. Revegetation of the capped repository would restore some habitat value to the repository site, but the value of this habitat is likely to be lower than the value of the undisturbed forest habitat.

There will be short-term direct impacts at both project sites during construction and implementation. These impacts include noise and air pollution from machinery and equipment and limited public access during construction.

Biological impacts

Populations of insects and fish in Lake Fork Creek would be expected to increase in response to the expected decrease in metals loading as a result of implementing the Tiger and Dinero Tunnel projects. In addition, wildlife that depend on clean water and on insects and fish as sources of prey would benefit from improvements to water quality in Little Frying Pan Gulch, Colorado Gulch, and Lake Fork Creek. Wildlife that use the wetland and riparian resources at the Dinero Tunnel site would benefit from the recovery of vegetation that is currently stressed by metals contamination.

Cultural resource impacts

The BLM consulted with designated officials at the Colorado State Historic Preservation Office (SHPO) to determine if the proposed undertakings would result in adverse effects to cultural resources at either the Dinero Tunnel or Tiger Tunnel sites. The BLM and SHPO found that there would be adverse effects to cultural resources. To mitigate these adverse effects, and pursuant to BLM's Protocol Agreement with SHPO, BLM submitted treatment plans and has received concurrence from the SHPO.

At the Dinero Tunnel, mitigation work consisted of two mitigation actions: (1) additional research on the site involving the recording and evaluation of the mining operation's other components, including the Dinero Shaft and the Dinero Discovery Shaft; and (2) development of an archaeological context document for the entire mining district to help researchers identify, understand, and evaluate the significance of other mining resources. The objectives of these mitigation actions were to enhance the current understanding of the greater Dinero mining

operation and lay the groundwork for future cultural resource work in the mining district. The mitigation was completed in 2003.

At the Tiger Tunnel site, mitigation will include additional research on the site, and the recording and evaluation of the mining operation's other components, including the Tiger-Shields Shaft and the millsite. A historic narrative and site forms will document this work.

Native American religious concerns

Several cultural resource inventories have been conducted in the area, and no sites that might hold special significance for Native Americans were found. However, if any such sites are found during the course of the proposed undertaking, work will cease and will not resume until consultation is complete. Because no impacts are expected, there are no recommended mitigation measures.

Environmental justice

This alternative would benefit the residents of Leadville, including minority and low-income populations, through improvement of fishing opportunities in Colorado Gulch and Lake Fork Creek. No short-term adverse effects on the local community are expected.

Socioeconomic impacts

This alternative would have positive socioeconomic impacts on the local community. Construction activities at the Dinero Tunnel and Tiger Tunnel sites would generate additional economic activity in the short-term. Improved fishing amenities would benefit locals directly and, potentially indirectly, through increased revenues from tourism.

Indirect impacts

Environmental consequences will not be limited to the location of the specific restoration sites selected for preferred restoration alternatives. Trustees expect that indirect beneficial impacts will occur in areas surrounding the preferred restoration sites, as the projects are expected to increase populations of resident fish in Lake Fork Creek and provide improved habitat for birds and wildlife. The Trustees do not expect that there will be negative indirect impacts of the restoration projects away from the project sites.

Cumulative impacts

The restoration projects were designed to improve natural resources in order to compensate for natural resource injuries. Therefore, the cumulative environmental impact from implementing the restoration projects is expected to be beneficial. Any decrease in air quality associated with

implementation of the projects is expected to be minimal and short-term. Springs that may surface uphill of the Dinero Tunnel site are expected to have good water quality. The terrestrial habitat that is impacted by construction of the on-site repository at the Tiger Tunnel site will be offset by the benefits to terrestrial habitat that will occur from the relocation of contaminated mine-waste piles at the site. Riparian habitat would improve on Little Frying Pan Gulch and Lake Fork Creek. There also would be long-term benefits to water quality, fish, and wildlife in and around the project sites.

Impacts to the historic properties will be unavoidably adverse, but the BLM and SHPO are satisfied that the treatment activities sufficiently mitigate the adverse effect. No additional cumulative impacts are anticipated.

6. Monitoring Program and Performance Criteria

The overall objective of the monitoring program is to determine whether the Dinero Tunnel and Tiger Tunnel restoration projects will have succeeded in (1) reducing the loading of metals into Lake Fork Creek, and (2) allowing a healthy fish community to develop there. This evaluation will take place at periodic intervals over a 10-year monitoring period and will include monitoring of water quality and aquatic biota in Lake Fork Creek. Specific monitoring plans will be developed by the appropriate agencies and stakeholder groups (e.g., CDOW, Lake Fork Watershed Working Group).

At the Dinero Tunnel, a 10-year monitoring period would follow installation of the bulkhead and would include measurements of the volume and chemistry of residual discharge from the tunnel as well as mine pool levels. Seeps in the tunnel and in surrounding areas also would be monitored for volume and chemistry to ensure that any new seeps outside of the tunnel were not contaminated. If monitoring indicated that residual flow from the tunnel was higher than desired, corrective actions could include additional post-construction grouting to reduce seepage through fractures around the bulkhead. If monitoring indicated that new contaminated seeps had started to flow outside the tunnel because of the increase in the mine pool level, the corrective action could include releasing water through the valve in the bulkhead to adjust the water level of the mine pool. Additional monitoring would likely take place after this 10-year period, under a long-term monitoring agreement with the landowner. Biological communities in the wetlands, fens, and riparian areas around the Dinero Tunnel would be monitored to verify that these resources responded positively to the expected decrease in metals loading.

At the Tiger Tunnel, operation, maintenance, and monitoring of the hydrologic and run-on controls and the limestone channels and settling ponds will be undertaken by Colorado Mountain College Natural Resource Management, under the terms of the CWA Section 319 Nonpoint Source Pollution Program grant they received from the EPA. Also, site water quality monitoring

will take place for five years by Colorado Mountain College following construction of the hydrologic controls and on-site repository. This monitoring will quantify the effectiveness of the restoration actions and determine the reduction in metals loading into Colorado Gulch. Additional monitoring would likely take place after this five-year period, with new funding sources being sought.

7. Budget Summary and Timetable

The settlement with Resurrection Mining Company and Newmont USA Limited provided $10.5 million for restoration of injured natural resources, with additional money expected from ASARCO LLC when the bankruptcy proceedings are completed. The Trustees have allocated $500,000 in funding toward these initial restoration projects to compensate for injuries to water resources in California Gulch; the total cost of completing the Dinero Tunnel and Tiger Tunnel projects is estimated at $1.8 million, with a variety of partners providing the remaining funding (Table 4). Restoration projects to be funded with the remaining settlement dollars will be described in a subsequent restoration plan. The Trustees will use additional settlement funds to implement restoration projects in accordance with the criteria developed by the Trustees, and in accordance with this and any other published restoration plans and any applicable federal laws, after consideration of public comment.

The Trustees expect to begin implementing the Dinero Tunnel and Tiger Tunnel restoration projects in the spring of 2009. Installation of the bulkhead in the Dinero Tunnel is expected to occur in 2009. Construction of the affiliated project (the bioreactor) will begin one to three years after the bulkhead installation. At the Tiger Tunnel, construction of the on-site repository and hydrologic controls is expected to take place in 2009. Construction of the affiliated project (limestone drains and the bioreactor) will take place one to two years after construction of the on-site repository and hydrologic controls. This delay is necessary because construction of the hydrologic controls and on-site repository may profoundly change the quantity and quality of discharge from the Tiger Tunnel. The limestone drains and bioreactor need to be optimized for the discharge from the Tiger Tunnel that occurs after the other control measures have been in place for one to three years, and the discharge has stabilized.

As discussed immediately above, monitoring at the Dinero Tunnel is scheduled to continue for 10 years after construction; monitoring at the Tiger Tunnel is scheduled to continue for five years after construction. At both sites, additional long-term monitoring is likely, but plans for this are not yet fully in place.

Table 4. Budget summary for Tiger Tunnel and Dinero Tunnel projects

Item	Estimated cost	Source of funds
Tiger Tunnel		
Construction of on-site repository	$425,000	BLM funding ($175k); NRDA funding ($250k)
Construction of hydrologic and run-off controls	$122,000	319 grant and matching funds[a]
Construction of limestone channels and settling ponds	$113,250	319 grant and matching funds ($13k); BLM funding ($100k)
Erosion controls during construction	$17,625	319 grant and matching funds
Water-quality monitoring and routine maintenance from 2008 to 2013	$30,875	319 grant and matching funds
Construction of sulfate-reducing bioreactor	$150,000	Trout Unlimited
Total for Tiger Tunnel	$858,750	
Dinero Tunnel		
Tunnel analysis and stabilization, baseline water sampling (completed)	$305,000	EPA, BLM, Division of Reclamation Mining & Safety (DRMS), U.S. Geological Survey (USGS), Colorado School of Mines, Colorado Mountain College
Bulkhead construction	$550,000	BLM ($150k), DRMS ($150k), NRDA funding ($250k)
Monitoring and sampling program (3 years)	$75,000	BLM[b]
Sulfate reducing bioreactor	Not known	Funding not yet in place
Total for Dinero Tunnel	$930,000	
Cumulative total for both projects (rounded)	**$1,800,000**	

a. The Lake Fork Watershed Working Group has received a funding commitment of $172,500 from EPA's CWA Section 319 Nonpoint Source Pollution Program, with an additional $105,000 pledged in matching funds for this project.
b. Funding for longer-term monitoring is actively being sought and is expected to come from a variety of sources that could include EPA 319 grant funding, the BLM, other EPA sources, and other Trustee agencies.

8. Coordination and Scoping

A variety of state and federal agencies are working together to plan and implement restoration activities to compensate for injuries at the Site. Agencies that are actively involved in these restoration activities include the USFWS, BLM, DNR, CDPHE, and the DOL. The Colorado DRMS within the Colorado DNR is taking the lead for implementation of much of the construction work associated with the Dinero and Tiger Tunnel restoration projects. Faculty and students from Colorado Mountain College also are involved in project implementation.

In addition, the Dinero and Tiger Tunnel projects have been closely coordinated with the work of the Lake Fork Watershed Working Group, which was formed in 2000 to address water quality issues in Lake Fork Creek. This stakeholder group includes representatives from Colorado Mountain College, a variety of federal and state agencies (listed below), Lake County, public interest groups, and private landowners in the area. The federal and state agencies involved include USFWS; BOR; EPA; US Department of Agriculture (USDA) Forest Service; BLM – National Science and Technology Center; USGS – Water Quality Division; CDPHE; Colorado DRMS; and DOW. This partnership has been working in cooperation for several years and these projects are an outgrowth of that partnership.

8.1 Trustee Council Organization and Activities

A council of the Trustees has been established pursuant to an MOU to coordinate and cooperate in carrying out the respective responsibilities of the trustee agencies to restore, replace, or acquire the equivalent of the natural resources injured or potentially injured as a result of the release of hazardous substances from the Site. The signatory agencies to the MOU are the CDPHE, DNR, DOL, and DOI. In addition, the USDA Forest Service is a signatory to the MOU but has asked USFWS to represent their Trustee interests at the Site. Each of the participating parties has one primary representative to the Trustee council.

The Trustee council, through its members acting on behalf of each Trustee, is responsible for all aspects of the restoration process, including developing and selecting final projects, implementing and overseeing the implementation of those projects, and monitoring and evaluating project effectiveness. All actions approved by the Trustee council are by unanimous approval.

8.2 Public Notification

Under federal regulations for conducting an NRDA and NEPA, natural resource trustees must notify the public and any other federal, state, and local government agencies that may have an interest in the activities analyzed in the RP/EA. Public notification activities undertaken by the Trustees include the following:

April 7, 2006: The Dinero Tunnel EE/CA with all the proposed alternatives was presented by Karl Ford of the BLM to the Lake Fork Watershed Working Group at an open public meeting.

October 3, 2006: The Dinero Tunnel EE/CA was presented by Roy L. Masinton of the BLM to the Lake County Commissioners at an open public meeting.

November 9, 2006: The Dinero Tunnel EE/CA was discussed at the Lake Fork Watershed Working Group open public meeting.

April 17, 2007: The BLM made an official presentation on the Dinero Tunnel project and the proposed alternatives. The meeting was publicized with flyers and a public notice in the local newspaper (*Leadville Herald Democrat*).

June 13-14, 2007: Field tours and discussion of the Dinero Tunnel and Tiger Tunnel projects were coordinated by the Lake Fork Watershed Working Group. These tours were open to the public.

August 10, 2007: The Dinero Tunnel project and the Colorado Gulch – Tiger Tunnel project were discussed at the Lake Fork Watershed Working Group open public meeting.

October 18, 2007: The Tiger Tunnel – Colorado Gulch projects were discussed at the Lake Fork Watershed Working Group open public meeting.

April 24–May 8, 2008: Public notification that the Tiger Tunnel EE/CA was available for review and comment was published in the *Leadville Herald Democrat*.

June 3, 2008: On-site inspection tour of the Dinero Tunnel site was open to the public and advertised through the Lake County Commissioners.

June 17, 2008: The Dinero Tunnel project was discussed at an open public meeting in Leadville with a presentation from the BLM about the project.

May 11, 2009: A Notice of Availability of the draft RP/EA was published in the Leadville Herald-Democrat and several other Colorado newspapers the week of May 11, 2009. Copies of the RP/EA were available for review at the U.S. Fish and Wildlife Service, Colorado Ecological Services Field Office. Copies were also available at the Lake County and Colorado Mountain College Libraries in Leadville, Colorado. In addition, the RP/EA was available on the Service's Upper Arkansas River natural resource damage assessment and restoration website or on CD-ROM by request. Interested members of the public were invited to review and comment on the RP/EA. The 30-day public comment period ended June 15, 2009. No comments were received that required modification of the draft RP/EA.

8.3 Responsible Party Involvement

The settling parties chose not to participate in restoration planning and implementation.

8.4 Administrative Record

The administrative record contains the official documents pertaining to the Site NRDA. The administrative record for the NRDA case is housed at the USFWS, Saguache Field Office, 46525 Highway 114, Saguache, CO 81149.

Background information on the proposed restoration alternatives can be found at the Timberline Library on the campus of the Colorado Mountain College located at 901 South Hwy 24 in Leadville, Colorado. This information includes the Dinero Tunnel and Tiger Tunnel EE/CAs and other associated reports and grant applications.

9. List of Preparers

This RP/EA was prepared by:

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under contract to the Colorado DRMS and in consultation with the Trustees. Eric Twitty, from the private company "Mountain States Historical" contributed to the section on cultural resources. The following Trustee representatives provided report preparation assistance.

Laura Archuleta, Contaminants Specialist
U.S. Fish and Wildlife Service

Dan Grenard, Geologist
U.S. Bureau of Land Management

Kirstin Brown, Project Manager/Reclamation Specialist
Colorado Division of Reclamation Mining & Safety

Vicky Peters, Senior Assistant Attorney General
Colorado Department of Law

Erik Brekke, Wildlife Biologist
U.S. Bureau of Land Management

Monica Weimer, Archeologist
U.S. Bureau of Land Management

10. List of Agencies, Organizations, and Parties Consulted for Information

Kato Dee, Project Manager
Colorado Mountain College

11. Public Comments and Trustees' Responses

Natural resource restoration planning must comply with the overlapping requirements of the CERCLA NRDA regulations and NEPA. In accordance with NEPA, this RP/EA summarizes the current environmental setting, describes the purpose and need for action, identifies alternative actions, assesses their applicability and environmental consequences, and summarizes efforts made to integrate public participation in the decision process. Under NEPA, the federal Trustees must assess the potential environmental impacts associated with each of the proposed restoration actions.

The CERCLA NRDA regulations and NEPA require public involvement. Public review of the proposed restoration actions presented in the Draft RP is an integral part of the Trustees' restoration planning process. The Trustees received one public comment expressing support for the proposed restoration actions. They did not receive public comments that required modification to the draft RP/EA.

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Finding of No Significant Impact (FONSI)

Restoration Plan and Environmental Assessment for Tiger and Dinero Tunnels Restoration, Lake County, Colorado

The natural resource trustee agencies, the U.S. Department of the Interior (DOI) and the State of Colorado, specifically represented by the U.S. Fish and Wildlife Service (Service), Bureau of Land Management, and the U.S. Bureau of Reclamation on behalf of DOI, and the Colorado Department of Natural Resources, Colorado Department of Public Health and Environment, and Colorado Department of Law, on behalf of the State of Colorado (collectively 'Trustees'), are proposing to implement a Restoration Plan/Environmental Assessment (RP/EA). This RP/EA presents a preferred alternative to address public losses resulting from surface water and groundwater injuries caused by releases of hazardous substances to and from the California Gulch Superfund Site (Site) near Leadville, Colorado.

Each Trustee is authorized to act on behalf of the public to evaluate potential injuries to natural resources and associated losses of ecological services resulting from releases of hazardous substances at the Site. Authority to act on behalf of the public is given to trustees in CERCLA [42 USC §§ 9601 *et seq.*] and the CWA [33 USC §§ 1251 *et seq.*]. Actions to restore, replace, or acquire the equivalent of lost resources are the primary means of compensating the public for injuries to natural resources under these authorities. Any funds used by Federal Trustees to implement restoration activities are subject to the requirements of the National Environmental Policy Act (NEPA) [42 USC § 4321]. Accordingly, the Trustees developed the RP/EA to identify restoration alternatives that partially address the resources injured and ecosystem services lost due to the release of mining-related hazardous substances, and to analyze the effects of those alternatives on the human environment. This RP/EA is not intended to quantify or to analyze the full extent of actions necessary to accomplish restoration of injured natural resources associated with the Site.

Resurrection Mining Company; Newmont USA Limited; and ASARCO LLC committed to fund restoration to resolve their liabilities for natural resource injuries at the Site. The restoration projects will be funded from the settlement funds received from these responsible parties. Additional restoration projects also will be funded out of these settlements and will be described in a future restoration plan that will address other injured resources, including injuries to aquatic resources in the Arkansas River.

The RP/EA lists and describes a proposed action/preferred alternative that consists of two projects addressing acid-mine drainage sources and pathways to natural resources in the upper Arkansas River drainage: breaking hazardous substance pathways to natural resources at the Tiger Tunnel and at the Dinero Tunnel. These projects, to be implemented by the Bureau of Land Management and the State of Colorado's Division of Reclamation, Mining and Safety, will control acid-mine drainage that is exposing and injuring aquatic natural resources in Lake Fork Creek and other tributaries and will compensate the public for injuries to surface water and groundwater resources that were caused by releases of hazardous substances at and from the

California Gulch Superfund Site. In addition, these projects have been the subject of previous announcements and public meetings (pages 26-27).

The public comments received did not identify any significant environmental issues or impacts. As documented in the Proposed Restoration Action/Preferred Alternative and Alternatives, including the Environmental Consequences Section (pages 8-23), the preferred alternative will have either no or inconsequential effects on social, economic, recreational, biological, and cultural resources. Over the long term, restoration projects are expected to have beneficial effects for trust natural resources.

A Notice of Availability was published in the Leadville Herald-Democrat and several other Colorado newspapers the week of 11 May 2009. Copies of the RP/EA were available for review at the U.S. Fish and Wildlife Service, Colorado Ecological Services Field Office. Copies were also available at the Lake County and Colorado Mountain College Libraries in Leadville, Colorado. In addition, the RP/EA was available on the Service's Upper Arkansas River NRDAR website or on CD-ROM by request. Interested members of the public were invited to review and comment on the RP/EA. The 30-day public comment period ended 15 June 2009. Written comments were considered and addressed in the final RP/EA at the conclusion of the 30-day public comment period. No comments were received that required modification of the RP/EA.

Based on my review and evaluation of the RP/EA, and after addressing the public comment and concerns submitted, I have determined that the implementation of the RP/EA for the Tiger and Dinero Tunnels is not a major federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969. Accordingly, preparation of an environmental impact statement is not required.

/s/ Noreen E. Walsh Date 8/17/09

Stephen D. Guertin
Regional Director, Region 6, U.S. Fish and Wildlife Service
Authorized Official of the U.S. Department of the Interior, Upper Arkansas River