

Purpose and Need for Restoration

This chapter 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. The Trustees determined in their preliminary estimate of damages that groundwater, aquatic, and terrestrial resources have been injured; that the locations of injury include California Gulch, and aquatic resources of the upper Arkansas River and terrestrial resources associated with the 500-year floodplain of the upper Arkansas River; and that restoration is required to compensate the public for these injuries (Industrial Economics, 2006). This RP focuses on projects that will address injuries to natural resources through the restoration of similar resources in locations within the upper Arkansas River Basin (Figure 2.1).

2.1 Summary of Release History and Resulting Public Losses

The Site extends over a large area including more than 15 square miles in and around the town of Leadville, Colorado. Extensive historic mining activities in and around Leadville generated more than 2,000 on-site waste rock piles and resulted in past and ongoing releases of heavy metals and acid mine drainage into California Gulch and, subsequently, to the upper Arkansas River Basin. In particular, the Yak Tunnel, which was constructed to dewater 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). Releases from California Gulch moved downstream into the upper Arkansas River Basin, resulting in downstream injuries to surface water, aquatic biota, and terrestrial resources, including terrestrial biota, riparian habitat, irrigated meadows, and fluvial mine-waste deposits (Redente et al., 2002; Industrial Economics, 2006; Lipton, 2007).

2.1.1 California Gulch

Surface water in California Gulch exceeds adverse effects thresholds for aquatic biota for zinc and cadmium and other metals (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 CDPHE basic standards for groundwater for human health, secondary drinking water, and agricultural standards (Tetra Tech/RMC, 2004). Injuries to surface water and groundwater in California Gulch are expected to continue into the foreseeable future.

2.1.2 Upper Arkansas River

Injured aquatic resources in the upper Arkansas River include surface water, benthic macroinvertebrates (including aquatic insects and other similar organisms), fish, and birds. Extensive injuries exist in the Arkansas River from the confluence with California Gulch downstream to Two Bit Gulch, also referred to as the 11-mile reach (Figure 2.1), and some adverse effects extend as far downstream as the Pueblo Reservoir. Surface water in the Arkansas River exceeds Colorado acute and chronic water quality criteria for cadmium, copper, lead, and zinc. The frequency and magnitude of

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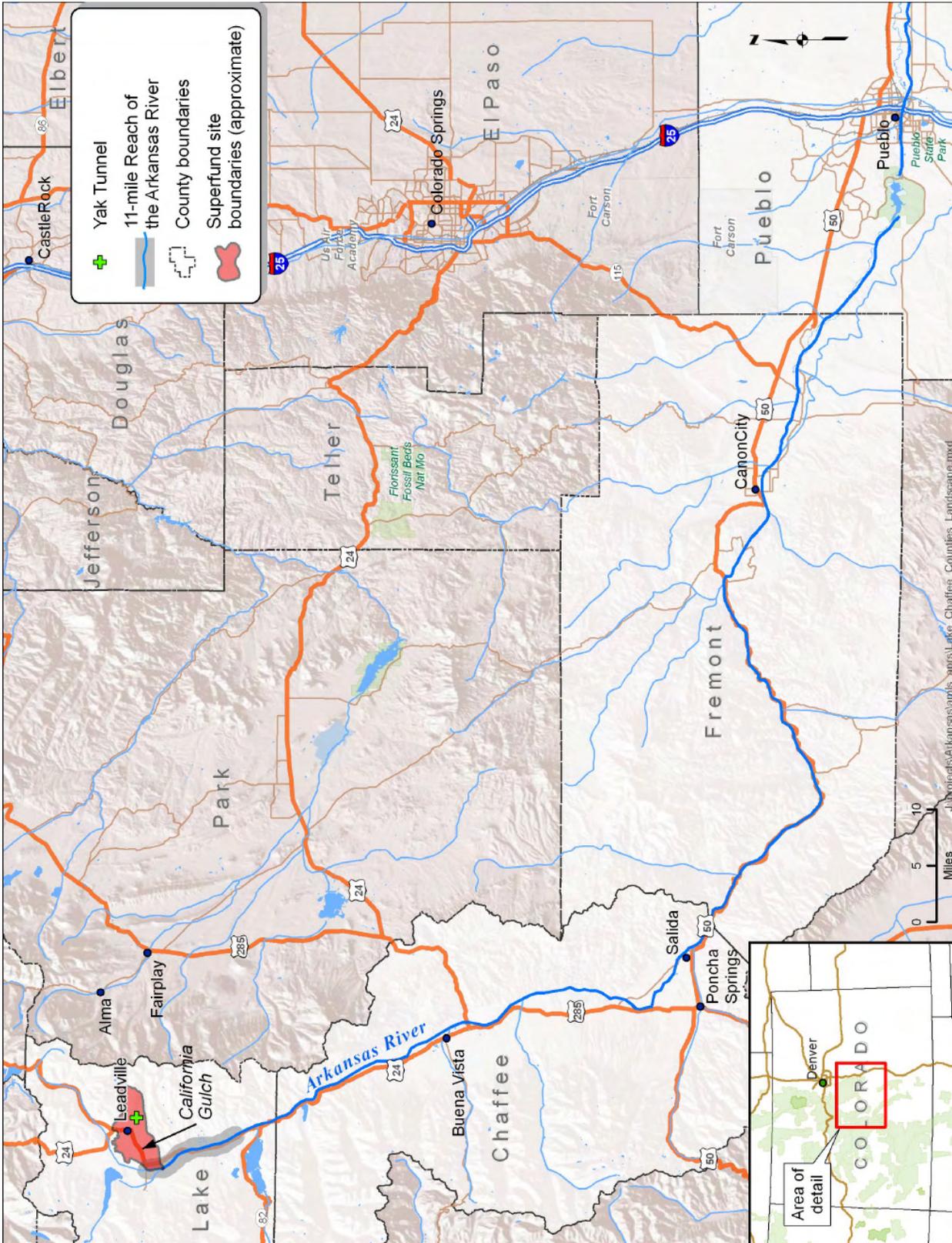


Figure 2.1. Overview map of the Site in the context of the upper Arkansas River Basin.

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water quality exceedences generally declines in the downstream reaches compared with exceedences observed in the 11-mile reach (Industrial Economics, 2006).

Surface water and sediment contamination have caused reductions in abundance, biomass, and diversity of the benthic macroinvertebrate community (Industrial Economics, 2006). These impacts are most severe in and immediately downstream of the 11-mile reach. The benthic community farther downstream was historically impacted but, since 1994, has recovered to approximately the same condition as that observed in reference areas (Industrial Economics, 2006).

Fish in the 11-mile reach are exposed to metals directly through contact with contaminated water and indirectly by feeding on contaminated benthic macroinvertebrates. Toxicity studies have found that historic metals concentrations were lethal to brown trout. Field population studies in the 1990s found that brown trout populations and biomass were greatly depressed compared with reference sites. Brown trout populations have begun to recover since the 1990s, however, indications exist to the persistence of toxic conditions (Industrial Economics, 2006). Fish populations downstream of the 11-mile reach also were historically impacted by metals contamination. Recent data show that fish in the area immediately downstream of the 11-mile reach are still impacted by metals concentrations. Since remedial activities were conducted in California Gulch, fish in the farther downstream reaches are recovering (Industrial Economics, 2006).

Birds dependent on aquatic resources also have been injured as a result of contamination in the aquatic environment, primarily by feeding on contaminated benthic macroinvertebrates. Tissue and blood samples found concentrations of cadmium, copper, lead, and zinc that are similar to those measured in benthic macroinvertebrates, indicating that aquatic-dependent birds have been exposed by the release of hazardous substances into the environment. Studies evaluating American dippers (*Cinclus mexicanus*) and tree swallows (*Tachycineta bicolor*) also evaluated nest success and evidence of toxicity. Birds nesting in the 11-mile reach had significantly lower nest success compared with reference sites (Industrial Economics, 2006). Similarly, blood and liver samples taken from American dippers indicate that lead contamination has injured migratory birds downstream of the 11-mile reach (Industrial Economics, 2006).

2.1.3 Terrestrial Resources

Terrestrial resources have been injured by releases of hazardous substances from the Site. More than 2,000 onsite waste rock piles have caused injuries to upland resources. Natural resources in the Arkansas River floodplain were exposed to hazardous substances when water from California Gulch or the upper Arkansas River was used to irrigate floodplain meadows, during flooding events, and from the presence of mine waste in the floodplain. EPA evaluated terrestrial resources in the 11-mile reach and found evidence that contamination was present in sufficient concentrations to cause a toxic response in plants. The Trustees concluded that, in addition to impacts to soils and vegetation, contamination is sufficient to cause injury to wildlife and livestock in the riparian and floodplain habitats (Industrial Economics, 2006).

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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, funds from natural resource damage settlements will be used only to restore, replace, or acquire the equivalent of natural resources injured, destroyed, or lost as a result of the release of hazardous substances, about which the settlement was reached.

Accordingly, this RP/EA has been developed to select restoration projects designed to compensate the public for injuries to natural resources in the upper Arkansas River Basin, caused by releases from the Site. 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 and 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 upper Arkansas River Basin are expected to reduce, remove, or compensate for the injuries caused by mining activities. In addition, because response actions at the Site are ongoing, the Trustees have chosen to focus on restoration alternatives that will not be put at risk by any planned or proposed response actions.

2.3 Need for Restoration

The proposed restoration actions are needed to restore natural resources equivalent to those injured by releases of hazardous substances to the upper Arkansas River Basin. Based on recommendations set forth in this RP/EA 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.

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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. All proposed restoration projects will comply with CWA requirements, including obtaining any necessary permits for proposed restoration actions. For example, it is likely that the proposed in-stream restoration projects will require a CWA Section 404 permit from the U.S. Army Corps of Engineers because the project will result in alterations to the current stream channel.
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 will comply with BLM land management policy and guidance where relevant.
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 and endangered (T&E) species. The following candidate, threatened, and endangered species are known to occur in Lake County, Colorado: Canada lynx (<i>Lynx canadensis</i> ; threatened), Greenback cutthroat trout (<i>Oncorhynchus clarki stomias</i> ; threatened), Gunnison’s prairie dog (<i>Cynomys gunnisoni</i> ; candidate), Penland alpine fen mustard (<i>Eutrema penlandii</i> ; threatened), and Uncompahgre fritillary butterfly (<i>Boloria acrocneuma</i> ; endangered). The areas potentially affected by the proposed restoration actions are not known to provide core habitat for any of these species, with the potential exception of the Paddock State Wildlife Area. Elimination of motorized travel on informal trails at the Paddock State Wildlife Area would benefit Canada lynx and the Uncompahgre fritillary butterfly, as well as bighorn sheep, northern leopard frog, and boreal toad.
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.

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2.4.2 Cultural Preservation

National Historic Preservation Act The National Historic Preservation Act (NHPA) of 1966, as amended, 16 USC §§ 470 et seq., is intended to preserve historical and archaeological sites. Compliance with the NHPA would be undertaken through consultation with the Colorado State Historic Preservation Office (SHPO), which is discussed further in Chapter 5.

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 Safety and Health 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.