Colorado Department of Public Health and Environment

CENTRAL CITY/CLEAR CREEK SUPERFUND SITE

Amendment to the Operable Unit 3 and Operable Unit 4

Records of Decision

for the Addition of an

On-Site Repository

Prepared in Cooperation with the United States Environmental Protection Agency

Region VIII

Denver, Colorado

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DECLARATION

SITE NAME AND LOCATION

The Central City/Clear Creek Superfund Site (Site) is located approximately 30 miles west of Denver, Colorado within Clear Creek and Gilpin counties. The Central City/Clear Creek area was one of the most heavily mined areas in Colorado during the late 1800's, producing large quantities of metals such as gold, silver, copper, lead, nickel, and zinc. The Study Area for the Site is located within the Clear Creek watershed, which spans approximately 400-square miles. In 1983, the U.S. Environmental Protection Agency (EPA) listed the Site on the National Priorities List (NPL). The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Site Identification Number is COD980717557.

STATEMENT OF BASIS AND PURPOSE

This decision document amends the remedy decision for the Central City/Clear Creek Superfund Site, Operable Units (OUs) 3 and 4. This ROD amendment has been developed in accordance with the requirements of the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 U.S. Code (USC) 9601 *et. seq.* as amended, and to the extent practicable, the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), 40 CFR Part 300. This amendment is based on the Administrative Record for the Central City/Clear Creek Superfund Site. The Colorado Department of Public Health and Environment (CDPHE) and EPA have jointly selected the amended remedy.

ASSESSMENT OF THE SITE

The response action selected in this ROD amendment protects public health and the environment from actual or threatened releases of hazardous substances into the environment. Such release, or threat of release, may present an imminent and substantial endangerment to public health or welfare or the environment.

The remains of historical mining operations in the Central City/Clear Creek Superfund Site include numerous mine waste piles which erode and leach into the Clear Creek and the North Fork of Clear

Creek. The high concentrations of metals in mine waste piles adversely impact aquatic life and potentially pose a risk to water supplies in Clear Creek and the North Fork of Clear Creek.

DESCRIPTION OF THE SELECTED REMEDY

The selected amended remedy for OUs 3 and 4 adds an additional remedial action component, an on-site repository, to the previously selected remedial actions. The additional remedy component will allow materials that are subject to CERCLA response actions to be consolidated into an on-site repository that will be constructed within the Central City/Clear Creek Superfund Site Study Area. The OU 4 ROD made repeated references to potential use of an on-site repository for waste rock and tailings piles, and the OU 3 ROD selected response actions that could consolidate waste rock piles and produce water treatment solids through the operation of the Argo Water Treatment Plant. Neither the OU 3 nor OU 4 RODs, however, explicitly incorporated construction of an on-site repository into the selected response actions. The repository will provide a location for the consolidation of waste rock and tailings piles, water treatment solids, and metals-contaminated sediment.

The major components of the OU 3 and OU 4 selected remedies that are relevant to this ROD amendment include:

OPERABLE UNIT 3

The OU 3 ROD, signed in 1991, selected response actions for acid mine drainage and mine waste rock and tailings piles. The OU 3 ROD included treatment of the Argo Tunnel discharge and Virginia Canyon ground water in Clear Creek County; and in Gilpin County, the collection and piping of the Gregory Incline, National Tunnel, and the Quartz Hill Tunnel discharges to prevent potential human contact with contaminated tunnel waters. A decision whether to treat these discharges was deferred to the OU 4 ROD pending further investigation of the sources of metals contamination in the North Fork sub-basin of Clear Creek.

The OU 3 ROD called for in-place capping of waste rock piles, tailings piles, and/or slope stabilization of the following locations:

- Gregory Gulch Numbers 1 and 2 waste rock piles
- Chase Gulch Numbers 1 and 2 waste rock piles

- Clay County, Boodle Mill, McClelland Mill, North Clear Creek, Golden Gilpin Mill, Black Eagle Mill and Little Bear tailings piles
- Quartz Hill tailings pile

The OU 3 ROD also considered on-site consolidation of certain waste rock and tailings piles; however, individual pile capping was selected because at the time it was predicted to be more cost-effective.

OPERABLE UNIT 4

The OU 4 ROD, signed in 2004, provided for:

- the collection, conveyance and active treatment of the Gregory Incline discharge and ground water in Gregory Gulch, a tributary to the North Fork of Clear Creek;
- the collection, conveyance and passive treatment of the National Tunnel discharge; and
- sediment control through the implementation of capping, stabilization, run-on controls, and/or removal at the Argo, Pittsburg, Mattie May, Baltimore, Iroquois, Anchor, Hazeltine, Druid, Upper Nevada Gulch, Niagara, Centennial, Old Jordan and Gregory Gulch Number 3 waste rock or tailings piles.

The OU 4 ROD contemplated several options for the remediation of the waste rock and tailings piles:

- in-place capping
- consolidation and capping
- off-site disposal to a Front Range landfill
- consolidation into an on-site repository

STATUTORY DETERMINATIONS

The amended remedies for OUs 3 and 4 continue to be protective of human health and the environment, comply with federal and state requirements that are applicable or relevant and appropriate for the remedial action, are cost effective, and utilize permanent solutions through proper disposal and containment of mining wastes in the on-site repository. The selected remedy in the amendment does not satisfy the statutory preference for treatment as a principal element because the large volume of mining-related materials makes treatment impractical.

amendment does not satisfy the statutory preference for treatment as a principal element because the large volume of mining-related materials makes treatment impractical.

Because the remedies will result in hazardous substances or pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action and every five years thereafter to ensure that the remedies continue to provide adequate protection of human health and the environment. In addition, institutional controls, identified in the OU 4 ROD, are included as requirements to ensure the integrity of the remedy.

AUTHORIZING SIGNATURES

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9/14/06
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DECISION SUMMARY

1.0 INTRODUCTION

This amendment to the OU 3 and OU 4 RODs for the Site adds an additional remedial component, an on-site repository, which will be specifically designed and utilized for the consolidation and containment of mining-related materials generated by CERCLA response actions in the Central City/Clear Creek Superfund Site. These materials include metals-contaminated waste rock, mill tailings, sediments from retention basins, and solids generated from the treatment of acidic metals-laden surface and ground water from historic underground mine workings. This amendment presents the rationale for the addition of an on-site repository as a remedial action component, describes the attributes of three potential repository locations, and identifies a preferred location.

The Central City/Clear Creek Site is located in Clear Creek and Gilpin counties, approximately 30 miles west of Denver. The Superfund study area is within the 400-square mile drainage basin of Clear Creek, which has been affected by numerous inactive precious metal mines. The Superfund cleanup efforts to date have focused on OU 1 and OU 2 priority mine drainage tunnels and OU 3 priority mine tailings and waste rock piles that have a high potential to erode and impact surface water quality. OU 4 remedial design efforts are underway.

CDPHE and EPA work as a team on the Site with CDPHE acting as the lead agency since 1988. The CDPHE and EPA are issuing this ROD amendment as part of its responsibilities under Section 117 of CERCLA, as amended by the Superfund Amendment and Reauthorization Act of 1986, and pursuant to the National Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Section 300.435 (c)(2)(ii).

The OU 3 ROD, signed by CDPHE and EPA on September 30, 1991, selected response actions that included capping and institutional controls for selected mine waste rock piles. Additionally, the Record of Decision selected the construction and operation of the Argo Water Treatment Plant to address metals-laden surface and ground water released to the environment from underground mine workings within Clear Creek and Gilpin Counties that drain via the Argo Tunnel and that are present as ground water in Virginia Canyon. The OU 3 ROD did not select the on-site consolidation option but ultimately called for in-place capping of individual waste rock piles because in-place closures were predicted to be more cost effective. CDPHE and EPA signed the OU 4 ROD on September 29, 2004. The OU4

response actions for mine waste rock, tailings, and sediments were intended to be flexible and included in-place capping, consolidation and capping, disposal to an off-site permitted location, or relocation of materials to an on-site repository. The OU 4 ROD, however, did not explicitly select a repository as a remedial action component.

The construction of an on-site repository for the consolidation of Central City/Clear Creek Site CERCLA response action materials will provide a protective, efficient, and effective opportunity to clean up mine wastes and dispose of water treatment plant solids. The repository provides an option to in-place capping of individual waste rock piles and mill tailings in Clear Creek and Gilpin counties. Solids generated from the treatment of acid mine drainage in Clear Creek and Gilpin counties will be dried at the repository and consolidated rather than being taken to a Front Range landfill. Reduced costs related to disposal of the treatment plant solids will offset anticipated operational costs of the repository.

Local voluntary projects such as recent EPA-approved mine waste consolidation activities by the Clear Creek Watershed Foundation are examples of projects that could benefit from the availability of a repository. Mine wastes to be accepted at the repository will have been generated and deposited solely from within Clear Creek or Gilpin Counties as encompassed by the Superfund Study Area and approved by the EPA and CDPHE.

The repository will provide the same level of or greater protection to human health and the environment as the response actions originally intended to be implemented under the OU 3 and OU 4 RODs. The repository will provide a protective, efficient and effective opportunity to clean up mine waste and dispose of water treatment plant solids. CDPHE and EPA, therefore, select the on-site repository as an additional remedial action component for the OUs 3 and 4 waste rock and mill tailings, sediment from sediment control structures, and the solids generated from the treatment of mine discharges in both of the counties.

This amendment to the OU 3 and OU 4 ROD will become a part of the Administrative Record in accordance with § 300.825(a)(2) of the NCP. The Administrative Record for the Site is located at the CDPHE and EPA:

Hazardous Materials and Waste
Management Division
4300 Cherry Creek Drive South
Room B 215
Denver, Colorado 80246-1530
(303) 692-3331

EPA Superfund Records Center
999 18th Street
Suite 300
Denver, Colorado 80202
(303) 312-6473/6968

Key documents from the administrative record are also available at the following Site information repositories:

Upper Clear Creek Watershed Association
2060 Miner Street
2nd Floor
Idaho Springs, Colorado 80452

Gilpin County Court House
203 Eureka Street
2nd Floor
Central City, Colorado 80427

2.0 SITE LOCATION, CONTAMINATION AND SITE-WIDE REMEDY

The Superfund Study Area covers the 400-square mile drainage basin of Clear Creek (refer to Figure 1). The water quality of the watershed is compromised by several diverse sources of metals contamination including: acid mine drainage from historic mine tunnels, ground water associated with flooded historic underground mine workings, and sediment eroded from mine waste rock piles and tailings piles. As a result, the EPA included the Site on National Priorities List in 1983. In June 1988, the EPA transferred the lead role of the Site to CDPHE. The CDPHE and EPA have jointly selected the amended remedy.

EPA has organized work at the Site into separate working units known as Operable Units. The Central City/Clear Creek Superfund Site includes four Operable Units which were designated to address heavy metals contamination associated with historic mining activity in the Clear Creek drainage basin. The EPA and the CDPHE have published four Records of Decision which call for a variety of remedial actions under OUs 1, 2, 3 and 4:

- OU 1 focused on acid mine drainage from five tunnels: the National, Gregory Incline, Quartz Hill, Argo, and Big Five. The ROD was signed in September 1987. The ROD

selected passive treatment of the discharging acid mine water. The OU 1 ROD was later amended by the OU 3 ROD.

- OU 2 addressed mine tailings and waste rock associated with the five discharging tunnels. The ROD was signed in March 1988.

- Further investigation based on a watershed approach expanded the list of tunnels and tailings/waste rock piles being addressed and the OU 3 ROD included: capping or other controls of certain waste rock piles and tailings piles; treatment of the Argo Tunnel and Burleigh Tunnel discharges; assessment, collection and treatment of Virginia Canyon groundwater; and collection and piping of the Gregory Incline, National Tunnel and Quartz Hill tunnel discharges. A decision as to whether or not to treat the Gregory Incline, National Tunnel and Quartz Hill discharges was deferred to the OU 4 ROD pending further investigation. The OU 3 ROD was signed on September 30, 1991. In 2003, the OU 3 ROD was amended from passive treatment of the Burleigh Tunnel discharge to No Further Action, with monitoring.

- OU 4 focused on the watershed of the North Fork of Clear Creek. Components of the OU 4 ROD included: capping/removal of priority tailings/waste rock piles in the North Fork of Clear Creek drainage; treatment of discharges from the Quartz Hill, Gregory Incline and National Tunnels; collection and treatment of the drainage/ground water Gregory Gulch; and sediment control in the North Fork of Clear Creek and its tributaries. The OU 4 ROD was signed on September 29, 2004.

3.0 BASIS FOR THE AMENDMENT

While not directly addressed by the OUs 3 and 4 RODs, CDPHE and EPA had been considering the option of constructing a mine waste repository to be used for relocating mine waste pile material and water treatment plant solids generated by Central City/Clear Creek CERCLA response projects such as the Argo Tunnel treatment plant in Idaho Springs. The OU 4 ROD discusses the option of relocating waste piles and water treatment solids to an on-site repository as part of the selected remedial option, but the ROD does not explicitly include construction of a repository as a selected remedial action

component. The CDPHE and EPA now add the repository component to the previously selected remedies to provide an additional protective, efficient and effective way of addressing mine wastes and disposing of water treatment plant solids.

3.1 REPOSITORY STUDY

With EPA concurrence, CDPHE contracted with an engineering consulting firm in 2000 to assess three mining-impacted properties in Clear Creek and Gilpin counties for the construction of an on-site repository (Golder and Associates, 2001). The evaluation criteria included: land ownership; site setting; access; site design; geologic conditions; historic mining use impacts; geotechnical conditions; surface water conditions; groundwater conditions; and regulatory considerations. Two of the properties evaluated are located in Gilpin County and include the Glory Hole and the Druid Mine area/Church Placer Claim, and the third property, in Clear Creek County, is the Gem/Franklin area (refer to Figure 2). Details on the three properties are provided in the following table.

TABLE 1. COMPARISON OF POTENTIAL REPOSITORY LOCATIONS
(Golder and Associates, 2001 and 2006)

SITE NAME	COUNTY	ESTIMATED USABLE SURFACE AREA (acres)	ESTIMATED REPOSITORY CAPACITY (cubic yards)	ESTIMATED COST
GEM/FRANKLIN	CLEAR CREEK	1.7/3.2	80,000/85,000	$1,250,000
GLORY HOLE (Open Pit)	GILPIN	6.8	560,000	$4,350,000
DRUID (Church Placer claim)	GILPIN	9.5	270,000	$1,470,000

According to the engineering consulting report (Golder and Associates, 2001), the Gem waste rock pile consists of approximately 1.7 acres of usable area and the Franklin Mine area consists of approximately

3.2 acres of usable area. For both the Gem and Franklin, repository development is limited by the relatively small, constrained areas of the sites, steep slopes and presence of underground workings which could pose a subsidence concern. Additionally, the road to the Gem pile and Franklin is a one-lane road. Road construction would have to be completed to improve access to this area.

The Glory Hole open pit site was evaluated as a potential location for a large volume repository. A large volume of waste could be contained in the open pit, and the area surrounding the pit used for staging. The disposal capacity is estimated to be 560,000 cubic yards (cy). However, unloading, placement, and spreading of materials into the repository would be an engineering and operational challenge due to pit depth (up to 160 feet), instability of the pit walls, and limited access. A considerable construction effort would be required to make the pit walls safe resulting in high capital cost.

The engineering report identified the Druid Mine area/Church Placer Claim as the most favorable location of the three evaluated and recommended further site evaluation. While the location did not receive the highest score in all categories, this ranking was based on the overall evaluation results including the suitability of the terrain, acreage, capacity (270,000 cy) and access. Three conceptual design layouts were developed with disposal areas ranging from 4.9 to 6.8 acres and disposal capacity ranging from 165,000 to 270,000 cy.

Much of the site surface reflects the past mining activities, as it is largely unvegetated or poorly vegetated, eroded and shows evidence of stormwater contacting the exposed acid-generating materials. During rain storms and snow melt, metals-contaminated and sediment-laden surface water runs off the property into South Willis Gulch, a tributary to the North Fork of Clear Creek. Sampling results show that the Church Placer Claim is contaminated with metals including arsenic, cadmium, copper and lead from historical mining and the 1990s-era operation of a cyanide-based heap leach facility (Lewis, 2006). The human health and ecological risks associated with this property are the same as those described in the subsequent section entitled, “Summary of Site Risks.” The OU 4 ROD identified the Druid Mine area/Church Placer Claim as a priority mine waste site for remediation. While the Gem Mine and the Glory Hole both also have significant mining impacts, the potential run-off problems and off-site sediment runoff potential of these sites do not appear to be as significant as the Church Placer. Locating the repository at the Druid Mine area/Church Placer Claim would help improve conditions at the property and promote remedial action efficiencies. The actions needed to stabilize the site and prevent

continued off-site transport of contaminated materials are complementary with the construction of an engineered repository. As the repository would be filled, a soil cover would be constructed and vegetated and drainage control features would be constructed to manage run-off to South Willis Gulch. These restoration activities would enhance the local ecology and present a more attractive site. The site might ultimately have potential productive uses, such as habitat for wildlife or open space.

If circumstances prevent construction of the repository at the Druid Mine area/Church Placer Claim, the remedy may be implemented at either the Glory Hole, Gem/Franklin or another site.

3.2 STATEMENT OF BASIS AND PURPOSE

This decision document amends the OU 3 and OU 4 RODs to add an additional remedial action component, an on-site repository. This ROD amendment has been developed in accordance with the requirements of CERCLA, 42 U.S.C. 9601 *et seq.* as amended, and to the extent practicable, the NCP, 40 CFR Part 300. The response actions selected in the OU 3 and 4 RODs are necessary to protect human health and the environment from actual or threatened releases of hazardous substances into the environment. This amendment to the OU 3 and 4 RODs, which adds an additional remedial feature, an on-site repository, will provide the same, or more, protection of human health and the environment as the response actions selected in the original OU 3 and 4 RODs. The repository will provide additional flexibility in the means of accomplishing the OU 3 and OU 4 remediation. Finally, the repository may also facilitate additional response actions for other Site mine waste piles because the on-site repository will provide an alternative to in-place capping or off-site disposal. CDPHE and EPA, therefore, select the on-site repository as an additional remedial action component for the containment of Clear Creek and Gilpin County OUs 3 and 4 waste rock and mill tailings, sediments, and solids from the treatment of mining-impacted surface and ground water in both counties that are within the Site study area.

The preferred repository site, the Druid Mine area/Church Placer Claim, was identified for remedial action under the OU 4 ROD. The ROD does not call for remedial action at the other two potential repository sites, the Gem/Franklin and Glory Hole. If locating the repository at Druid Mine area/Church Placer Claim is possible, it will help to address that property's existing environmental problems. The institutional controls that were already included as elements of the OU 3 and OU 4 selected remedies will also apply to the repository. An Environmental Covenant on the repository property will be placed

in the County real property records in accordance with remedial decision requirements of the Colorado Hazardous Waste Act.

4.0 OU 3 and OU 4 REMEDY DESCRIPTION

The major components of the OU 3 and OU 4 selected remedies that are relevant to this ROD amendment include:

OPERABLE UNIT 3

The OU 3 ROD piles (OU 3 ROD, pages 56-59) selected response actions for acid mine drainage and mine waste piles. The OU 3 ROD included treatment of the Argo Tunnel discharge with chemical precipitation and treatment of Virginia Canyon ground water in Clear Creek County, and the collection and piping of the Gregory Incline, National Tunnel, and the Quartz Hill Tunnel discharges for Gilpin County to prevent potential human contact with contaminated tunnel waters. A decision as to whether or not to treat these discharges was deferred to the OU 4 ROD pending further investigation of the sources of metals contamination in the North Fork sub-basin of Clear Creek.

The OU 3 ROD called for in-place capping of waste rock piles, tailings piles, and/or slope stabilization of the following locations:

- Gregory Gulch Numbers 1 and 2 and Chase Gulch Numbers 1 and 2 waste rock piles
- Clay County, Boodle Mill, McClelland Mill, North Clear Creek, Golden Gilpin Mill, Black Eagle Mill, Little Bear and Quartz Hill tailings piles.

The OU 3 ROD also considered on-site consolidation of certain waste rock and tailings piles; however, individual pile capping was selected because at the time it was predicted to be more cost-effective. All of these OU 3 waste rock and tailings pile projects have been completed except for the Quartz Hill and Golden Gilpin tailings piles.

OPERABLE UNIT 4

The OU 4 ROD (OU 4 ROD, pages 53-56) provided for:

- the collection, conveyance and active treatment of the Gregory Incline discharge and ground water in Gregory Gulch, a tributary to the North Fork of Clear Creek;

- the collection, conveyance and passive treatment of the National Tunnel discharge; and
- sediment control through the implementation of capping, stabilization, run-on controls, and/or removal at the Argo, Pittsburg, Mattie May, Baltimore, Iroquois, Anchor, Hazeltine, Druid, Upper Nevada Gulch, Niagara, Centennial, Old Jordan and Gregory Gulch Number 3 waste rock piles.

4.1 REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) provide a general description of the intended purpose of the cleanup. This ROD Amendment does not change the established OU 3 and OU 4 RAOs.

4.2 SUMMARY OF SITE RISKS

CDPHE and EPA assessed potential human health and ecological risks associated with the existing contamination within the Clear Creek Study Area. The most significant environmental impacts associated with the site are the impacts on the Clear Creek stream system that include a reduced fishery and significant impacts to other aquatic life and habitat. Acidic mine water that drains from many mines contains various heavy metals, and mine wastes such as tailings and waste rock contribute to the non-point source impacts to the basin. Clear Creek is a drinking water source for more than one-quarter million people living in the Denver area, and is a favored place for kayaking, rafting, fishing, wildlife watching and gold panning. A surface water remedial action objective is to ensure that in-stream metals concentrations do not degrade drinking water supplies diverted from the main stem of Clear Creek.

Human Health Risks: Historic mining, milling and smelting operations resulted in contamination of the environment with a number of metals which were the objective of historic mining and refining activities (copper, lead, silver, zinc), as well as a variety of other metals that exist in the ore body (arsenic, aluminum, cadmium, chromium, fluoride, iron, manganese, mercury, nickel). Essentially, all of these metals occur at elevated concentrations (compared to background) in Site soil, mine wastes, surface water, and ground water. Arsenic and lead pose the majority of human health risk at the site and are considered contaminants of concern (COCs).

The risks to human health through contact with contaminants of concern in surface water/sediment, tailings/waste rock, ground water, fish and air were evaluated. Risks to human health are not expected from ingestion of surface water (based on municipal diversions) when used as drinking water, ingestion of surface water while swimming, and ingestion of fish based on the exposure scenarios evaluated in the risk assessment. There are potential risks associated with ingestion of contaminated ground water, incidental ingestion of tailings, and inhalation of airborne dust. Arsenic contributes most significantly to potential human health risk from ground water and tailings. The metals evaluated for the inhalation pathway, when assessed together, pose potential risks to human health. The combined excess carcinogenic risk range for inhalation of all contaminants is 4 cancer incidences per 100,000 people for the average and maximum exposure scenarios, respectively. The greatest proportion of total inhalation excess cancer risk is attributed to chromium. Metals data for mine waste rock piles show that both arsenic and lead would be expected to occur in some of the OU 4 mine waste piles at concentrations which pose a potential risk to human health. Lead exposures from ingestion of soil and dust pose potential risks to children.

The site clean-up action objective is to reduce the potential for future human exposure by capping, stabilizing or removing mine waste piles. Control measures will be used during clean-up activities that create dust to limit potential exposure.

Ecological Risks: The risk assessment identified the impact of mine waste contamination on aquatic organisms within the Clear Creek Study Area. Copper, zinc, cadmium and manganese were identified as COCs for aquatic life.

Aquatic organisms, mainly trout and macroinvertebrates, are the primary populations at risk within the North Fork and main stem of Clear Creek. This is due to their constant direct contact with contaminated surface water and stream sediments and their low tolerance for metal-contaminated water. The fish species that were evaluated include rainbow, cutthroat, brook, and brown trout.

Within the North Fork of Clear Creek metals concentrations are significantly elevated, and there is a clear risk of adverse reproductive effects to trout, and at certain times of the year, to the survival of trout. Tributaries of the North Fork including Gregory Gulch, Russell Gulch, and Chase Gulch have metals concentrations that also pose risks to trout. Macroinvertebrates are severely affected in the main stem of

North Fork and Gregory Gulch. Tunnel discharges within the North Fork (Gregory Incline, National Tunnel, Quartz Hill Tunnel) are expected to be acutely toxic to trout and macroinvertebrates. While the metals concentrations in Clear Creek are lower than in the North Fork of Clear Creek, the concentrations in Clear Creek present an impairment to trout reproduction.

The Ecological Risk Summary was confirmed by Colorado Division of Wildlife monitoring and assessments. No fish have been found during past Division of Wildlife monitoring in the North Fork of Clear Creek downstream of Black Hawk. The Division of Wildlife has also found that trout populations in the main stem of Clear Creek are less than would be present if metals concentrations were reduced. Macroinvertebrate sampling has documented that abundance and diversity of macroinvertebrates is lower than would be expected in non-impacted streams for both the North Fork of Clear Creek and the main stem of Clear Creek.

The site clean-up actions are intended to reduce runoff from tailings and waste rock piles to minimize metals impacts on the stream systems. Remediation goals are to improve stream water quality, promote the survival of brown trout in the North Fork of Clear Creek, and allow for a viable reproducing brown trout population in Clear Creek.

5.0 EVALUATION OF ALTERNATIVES

This section of the amendment profiles the relative performance of each alternative using the nine CERCLA criteria, noting how the amendment alternative, the on-site repository, compares with the OU 3 and 4 selected alternatives.

The nine criteria include:

1. Overall protection to human health and the environment. Addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated or reduced;

2. Compliance with applicable or relevant and appropriate requirements (ARARs). Addresses whether or not a remedy will meet all federal and state environmental laws or regulations;

3. Long-term effectiveness and permanence. Refers to expected residual risk and the ability of a remedy to provide reliable protection of human health and the environment over time;

4. Reduction in toxicity, mobility, and volume of contaminants. Refers to the preference for a remedy that reduces health hazards, the movement of contaminants, and the quantity of contaminants at the Site;

5. Short-term effectiveness. Addresses the period of time needed to complete the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy;

6. Implementability. Refers to the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services, administrative feasibility and coordination with other government entities are also considered;

7. Cost. Evaluates the estimated capital, operation, and maintenance costs. Cost estimates are expected to be accurate within a range of plus 50 to minus 30 percent;

8. Supporting agency acceptance. Indicates whether the supporting agency agrees with, opposes, or has no comment; and,

9. Community acceptance. Includes determining which components of the alternative interested persons in the community support, have reservations about, or oppose.

The comparison between the selected alternatives of the OU 3 and 4 RODs and the amended remedy, which provides for addition of an on-site repository to the OU 3 and OU 4 RODs, is summarized in

Table 2. The first two cleanup evaluation criteria, overall protection of human health and the environment and compliance with Applicable or Relevant and Appropriate Requirements (ARAR), are threshold criteria that must be met by the selected remedial action. The remaining criteria are used to help select the preferred remedy.

5.1 OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT

The amended remedy will continue to provide protection of human health and the environment through containment in an on-site repository. The repository will eliminate direct human contact contact with mine wastes and significantly reduces contaminant mobility through containment.

TABLE 2. COMPARISON OF REMEDIAL ALTERNATIVES BASED ON THE NATIONAL CONTINGENCY PLAN EVALUATION CRITERIA

CRITERIA	**Operable Unit 3 and Operable Unit 4 Selected Alternatives** (Combination of on-site individual waste pile capping, on-site consolidation and removal to a Front Range landfill)	**Amended Remedy** (Adds On-site Repository. Retains option of individual waste pile capping and consolidation)
Overall Protection	*Protective.* Exposure prevented by covering waste in place, covering waste in a central consolidation area or removing waste to an off-site landfill. Impacts to surface water reduced by containing or removing waste.	*Protective*. Exposure prevented by removing waste to a repository and covering with a vegetated soil cover. Impacts to surface water reduced by removing waste piles and consolidating in an engineered and properly sited repository. Addition of a repository may permit additional cleanup of CERLCA mining-related materials beyond the scope contemplated in the selected OU3 and OU4 ROD remedies.
Compliance with ARARs	*Complies* with action-, chemical-, and location-specific ARARs.	*Complies* with action-, chemical-, and location-specific ARARs.
Long-Term Effectiveness and Permanence	*Minimal-moderate residual risk.* Relies on containment of individual waste rock piles beneath covers (moderate risk), removal to off-site landfill (no residual risk) and consolidation (minimal residual risk).	*Minimal residual risk.* Relies on disposal in engineered repository to prevent migration and exposure. (Retains option of individually capping many of the waste piles, however, facilitates removal of materials that may be difficult to cap in place due to steep slopes or access limitations)
Reduction in Toxicity, Mobility, or Volume	Mobility reduced through soil/rock cover. Mobility permanently eliminated through removal to Front Range landfill. Mobility significantly reduced through on-site consolidation. No reduction in toxicity or volume.	Mobility significantly reduced through consolidation in on-site repository. No reduction in toxicity. Drying of the treatment plant solids will significantly reduce its volume.
Short-Term Effectiveness	*Minimal-moderate short-term risk.* Capping waste piles in place does not require excavation or contaminated material handling. Consolidation or off-site transport requires excavation of contaminated material. Risks are manageable through dust control and material handling procedures.	*Minimal-moderate short-term risk.* Consolidation involves excavation of contaminated material. Risks are manageable through dust control and material handling procedures during loading and transport of mine waste and drying and handling of treatment solids.
Implementability	*Implementable.* Readily available and proven technology.	*Implementable*. Readily available and proven technology.
Cost	*Moderate*. The OU 4 remedy estimated capital cost is $11,833,000 and the estimated annual operations and maintenance cost is $926,000 (ROD, 2004). The OU4 ROD contemplated a local means of mine waste management such as consolidating mine waste or placement in a repository. This was anticipated to include some mine waste piles and sediment from detention structures. However, OU 4 remedy cost estimates did not include constructing or operating a repository. If materials unsuited for in-place capping were disposed of in a Front Range landfill, costs would be higher than original estimates. Current Argo Treatment Plant solids disposal and OU4 treatment solids disposal (from future treatment of Gregory Incline water) in a Front Range landfill are estimated to cost approximately $245,000 per year.	*Moderate.* The construction of a 270,000 cubic yard on-site repository is estimated to cost $1,470,000. Costs saved by using the repository to manage treatment solids are estimated to be $165,000 per year. Sediment and mine waste disposal savings over offsite disposal are estimated to be another $25,000 to $65,000 per year, for a total operational benefit of $190,000 to $230,000 per year. Annual operations and maintenance costs for the repository are estimated to be $175,000. Therefore, the repository is anticipated to provide an annual benefit of $15,000 to $55,000 per year.

5.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

The amended remedy will continue to comply with Federal and State ARARs. No changes to the ARARs are necessary due to this amendment. A complete list of all ARARs identified for OU 3 and OU 4 remedial actions are included in the Records of Decision.

5.3 LONG-TERM EFFECTIVENESS AND PERMANANCE

The amended remedy will prevent exposure and migration of contaminants through containment. The design of the repository will address the containment of any metals-containing leachate generated through contact of mine waste with precipitation. Long-term monitoring and maintenance will be required to ensure effectiveness. Institutional controls will be permanent and provide long-term effectiveness consistent with future site conditions and land use. An Environmental Covenant on the repository property will be placed in the County real property records in accordance with remedial decision requirements of the Colorado Hazardous Waste Act.

Containment in the repository represents a similar level of effectiveness as containment in a landfill and a higher level of effectiveness as compared to containment in place (capped tailings piles). Implementing the amended remedy provides an overall gain in long-term effectiveness since a larger volume of mine waste material is contained in an engineered repository, and increases the options for local cleanup, which may facilitate additional cleanup, and which would further increase the overall remedial effectiveness.

5.4 REDUCTION OF TOXICITY, MOBILITY OR VOLUME (TMV) THROUGH TREATMENT

The alternate remedy and the original ROD rely on containment remedies that significantly reduce mobility. The large volume of mining-related materials precludes treatment or off-site disposal as a viable option, therefore, toxicity is not reduced through treatment. Volume is not reduced in the original ROD remedy. The alternate remedy calls for drying the water treatment solids, which significantly reduces its volume. Volumes of other mine wastes are not reduced in the amended remedy. The

amended remedy represents the maximum extent to which permanent solutions and treatment technologies can be incorporated into the CERCLA response action to address mine waste piles and water treatment residuals at the Central City/Clear Creek Site. Consistent with the National Contingency Plan statutory bias against off-site disposal, materials will no longer be disposed off-site.

5.5 SHORT-TERM RISKS

The addition of the alternative to the OU 3 and 4 remedies will not significantly increase short-term risks. The original ROD remedy involved similar activities including loading and off-site transport of mine waste materials. The same or greater attention to dust control will be required during loading, transport of mine waste, and materials handling at the repository.

5.6 IMPLEMENTABILITY

The amended remedy and the original ROD remedy are technically and administratively feasible and rely on proven technologies. Materials and services required to design and construct the repository are readily available.

5.7 COST

Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The additional remedy will provide flexibility for future mine waste disposal not otherwise incorporated in the prior RODs. This may allow more cleanup than could be done without the repository for a net present value comparable to the existing OU 3 and 4 RODs. The construction of a 270,000 cubic yard on-site repository is estimated to cost approximately $1,470,000. If construction of the repository at the Druid Mine area/Church Placer Claim is possible, part of the repository capital costs would be offset by clean-up efficiencies since the proposed repository site otherwise needs remediation.

Costs saved by using the repository to manage water treatment solids are estimated to be $165,000 per year versus off-site disposal (includes sludge from Argo Treatment plant and anticipated sludge from future treatment of Gregory Incline and Gulch). Disposal of sediment and mine waste piles in the repository over off-site disposal are estimated to be another savings of $25,000 to $65,000 per year, for a total operational benefit of approximately $190,000 to $230,000 per year. Annual operations and maintenance costs to manage the repository are estimated to be $175,000. Therefore, the repository is anticipated to provide an annual savings of $15,000 to $55,000 per year, compared to using off-site disposal.

5.8 SUPPORTING AGENCY ACCEPTANCE

The EPA assisted the CDPHE in preparation of the Proposed Plan and this ROD Amendment and concurs with the addition of an on-site repository.

5.9 COMMUNITY ACCEPTANCE

The Clear Creek County Commissioners, the City of Idaho Springs, the Clear Creek Watershed Foundation, Upper Clear Creek Watershed Association and several community members expressed support for the addition of an on-site repository to the ROD. No written comments were received in opposition to the addition of an on-site repository.

Several commenters made specific recommendations. The City of Central and several community members advised that no waste should be accepted from outside the Clear Creek watershed. Support for continued use of the Gem Waste Rock Pile as a consolidation area was expressed by the Clear Creek Watershed Foundation, Clear Creek County Commissioners and City of Idaho Springs. Several community members had questions, concerns or recommendations about access, traffic, repository design and the preferred location.

Specific written comments received and agency responses are included in Appendix A. This appendix also includes a summary of community outreach activities.

6.0 SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the comparison of the original OU 3 and OU 4 remedies to the amended remedy and public comments, the CDPHE and EPA have decided to add an additional remedial component, an on-site repository, to the previously selected OU 3 and OU 4 remedial alternatives. The repository will be used for the containment of Clear Creek and Gilpin County OUs 3 and 4 waste rock and mill tailings, sediments, and solids from the treatment of mining-impacted surface and ground water in both counties that are within the Site study area.

The addition of a repository as an additional remedial component was selected based upon the following reasons:

- As required, the addition of a repository meets the threshold clean-up evaluation criteria (overall protection of human health and the environment, and compliance with ARARs).

- The amended remedy will achieve remedial action objectives and reduce mobility of contaminants through containment. Placing waste rock in the repository versus capping in place provides a higher degree of containment for select waste piles that will be placed in the repository.

- The repository will provide the same level of or greater protection to human health and the environment as the response actions originally intended to be implemented under the OU 3 and OU 4 RODs. The repository will provide a protective, efficient and effective opportunity to clean up mine waste and dispose of sediments and water treatment plant solids. Consistent with the National Contingency Plan statutory bias against off-site disposal, materials will no longer be disposed off-site.

- The repository is anticipated to reduce operations and maintenance costs.

- The addition of a repository provides more flexibility by providing an additional means of containment of materials generated during CERCLA response actions. Local voluntary projects such as recent EPA-approved mine waste consolidation activities by the Clear Creek Watershed Foundation are examples of projects that could benefit from the availability of a repository. Mine

wastes to be accepted at the repository will have been generated and deposited solely from within Clear Creek or Gilpin Counties as encompassed by the Superfund Study Area and approved by the EPA and CDPHE.

The preferred location for the repository is the Druid Mine area/Church Placer Claim, a mining-impacted property. If construction of the repository at this location is possible, it will help to address existing environmental problems at the Druid Mine area/Church Placer Claim. Part of the repository capital costs would be offset by clean-up efficiencies since the Druid Mine area/Church Placer Claim site otherwise needs remediation. If circumstances prevent construction of the repository at the Druid Mine area/Church Placer Claim, the remedy may be implemented at either the Glory Hole, Gem/Franklin or another site

The design of the repository will use proven technologies to minimize infiltration into the repository wastes through an engineered cover and stormwater controls. Leachate generated through contact of metals-containing mine waste with precipitation during operation will be addressed by the engineering design. Applicable regulations include, but are not limited to, the Colorado Solid Waste Disposal Sites and Facilities Act and the Colorado Water Quality Control Act Storm Water Discharge Regulations.

Institutional controls will be established for the repository because waste will remain in place once the remedy has been fully implemented. These institutional controls will limit human exposure to mine wastes and ensure that the integrity of components of the remedy is maintained. Institutional controls will be permanent and provide long-term effectiveness consistent with future site conditions and land use.

7.0 STATUTORY DETERMINATIONS

Under CERCLA 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (ARARs) (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions to the extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off site disposal of untreated wastes. The following sections discuss

how the selected remedy meets these statutory requirements. The CDPHE and EPA believe that the selected alternative provides the best balance of tradeoffs with respect to the balancing and modifying criteria.

7.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The amended remedy will continue to protect human health and the environment by incorporating the additional remedial action component, an on-site repository, into the existing OUs 3 and 4 remedial actions.

- This repository will permit mine waste rock, tailings, and sediments, as well as water treatment solids from the treatment of surface and ground waters in Clear Creek and Gilpin Counties, to be placed into an area on-site that will be managed as a CERCLA response action. This contaminated material will be contained in the engineered repository, eliminating exposure pathways and significantly reducing mobility.

- The short-term risks to on-site workers associated with the operation of heavy equipment cannot be completely eliminated but will be minimized by engineering and administrative controls. Attention to dust control will be required during loading, transport of mine waste and materials handling and drying of treatment solids at the repository.

- Reducing the amount of metals-laden sediment that is transported to the North Fork of Clear Creek with sediment control, and the removal of waste rock piles and the capping of waste rock piles located along tributaries and the North Fork, will ultimately improve the water quality in both the North Fork and the main stem of Clear Creek.

7.2 COMPLIANCE WITH ARARs

The amended remedy will comply with the Federal and State ARARs that have been identified. A complete list of all ARARs identified for remedial actions at OU 3 and OU 4 can be found in the Records of Decision. No waiver of any ARARs is being sought for the amended remedy. Monitoring will be conducted, and the five-year reviews will be used, to confirm compliance with ARARs upon implementation of the amended remedy.

Chemical-Specific ARARs

Compliance of the selected remedy with all chemical-specific ARARs will be evaluated during the five-year reviews. It is expected that the amended remedy will comply with all chemical specific ARARs for the North Fork and will comply on the main stem segment 11. The point of compliance for these ARARs will be established and monitored through the implementation of long-term monitoring. The applicable or relevant and appropriate chemical-specific requirements identified for the amended remedial action include:

- Federal Water Pollution Control Act (Clean Water Act)
- National Primary Drinking Water Regulations
- Colorado Water Quality Control Act (Surface Water and Ground Water Regulations)
- Colorado Primary Drinking Water Regulations

Action-Specific ARARs

The amended remedy will comply with all action-specific ARARs. The ARARs identified for the amended remedial actions include:

- National Pollutant Discharge Elimination System (NPDES) Permit Regulations
- Federal Water Pollution Control Act (Clean Water Act), including Section 404 Dredge and Fill Regulations
- Federal Resource Conservation and Recovery Act (RCRA) Solid and Hazardous Waste Regulations
- Federal Underground Injection Control (UIC) Regulations
- Colorado Discharge Permit System
- Colorado Solid Waste Disposal Sites and Facility Act and Regulations
- Colorado Hazardous Waste Act and Regulations
- Colorado Noise Abatement Act
- Colorado Environmental Real Covenants Act

Location-Specific ARARs

The amended remedy will comply with all location specific ARARs. The ARARs identified for the amended remedial actions include:

- Executive Order No. 11900, Protection of Wetlands
- Executive Order No. 11988, Floodplain Management
- Section 404 of the Clean Water Act
- National Historic Preservation Act
- Historic and Archeological Data Preservation Act of 1974
- Executive Order 11593, Protection and Enhancement of the Cultural Environment
- Archeological Resources Protection Act of 1979

- Endangered Species Act
- Fish and Wildlife Coordination Act
- Migratory Bird Treaty Act
- Executive Order No. 12962, Recreational Facilities
- Colorado Solid Waste Disposal Sites and Facilities Act
- Historic Places Register
- Colorado Non-game, Endangered, or Threatened Species Act
- Colorado Wildlife Act

Several regulations pertaining to the preservation of historic features have been identified as ARARs. Compliance will be achieved through implementation of procedures to document or preserve historical and archeological data should qualifying historical features be affected by the remedy.

7.3 COST-EFFECTIVENESS

The amended remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness (NCP 300.430(f)(1)(ii)(D))." This determination is accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e. were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. Proportional to costs, the selected remedy provides the best overall effectiveness of the alternatives considered. The selected remedy will achieve remedial action objectives for the contaminated material and reduce mobility of contaminants. The remedy makes use of proven technology that will be protective over the long term.

7.4 UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT (OR RESOURCE RECOVERY) TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The amended remedy represents the maximum extent to which permanent solutions and present treatment technologies can be practicably used to address mine waste piles and water treatment solids at the Site. The materials will not be disposed off-site, thus addressing the National Contingency Plan statutory bias against off-site disposal

7.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

While the remedy selected in the amendment does not satisfy the statutory preference for treatment as a principal element, a repository is a proven technology approved by EPA and widely utilized for consolidation of mine waste at numerous mining-impacted CERCLA sites throughout the western United States.

7.6 FIVE-YEAR REVIEW REQUIREMENT

Because this amended remedy will result in hazardous substances or pollutants or contaminants remaining above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after construction and implementation of remedial action and every five years thereafter to ensure that the remedy remains protective of human health and the environment.

8.0 REFERENCES

Colorado Department of Public Health and Environment. 1991. Record of Decision. Operable Unit 3 Clear Creek/Central City Superfund Site, Colorado. September 30.

Colorado Department of Public Health and Environment and the United States Environmental Protection Agency, Region VIII. 2004. Record of Decision. Operable Unit 4 Clear Creek/Central City Superfund Site. September 29.

Colorado Department of Public Health and Environment and the United States Environmental Protection Agency, Region VIII. 2006. Proposed Plan to Amend the Records of Decision for Operable Units 3 and 4 to Add an On-Site Repository. June 1.

Golder and Associates. 2001. Clear Creek/Central City Superfund Site. Repository Characterization Assessment. Project # 8609-I. October 31.

Golder and Associates. 2006. Clear Creek/Central City Superfund Site. Laboratory Testing and Material Characterization. March 24.

Golder and Associates. 2006. Clear Creek/Central City Superfund Site. Repository Site Characterization Assessment Cost Estimates Update. April 5.

Lewis, J.D. 2006. Church Placer Claim Analytical Results Report. February 15.

APPENDIX A

RESPONSIVENESS SUMMARY

This Appendix A contains the responses of the Colorado Department of Public Health and Environment (CDPHE) Hazardous Materials and Waste Management Division (HMWMD) and U.S. Environmental Protection Agency (EPA) to comments received concerning the Proposed Plan to Amend the Records of Decision for Operable Units 3 and 4 to Add an On-Site Repository. This Appendix summarizes the comments received and provides responses. The original comments are on file at the Site information repositories located at the CDPHE and EPA ("the agencies") and are available for public review.

A Proposed Plan, describing the proposed change to the Operable Unit (OU) 3 and OU 4 Records of Decision (RODs), was issued on June 1, 2006, and made available to the public and Clear Creek and Gilpin counties for review and comment. The CDPHE distributed the Proposed Plan by mail to more than 270 addressees in the surrounding communities, placed copies in the Site information repositories and posted the plan on the Clear Creek/Central City Superfund Site website maintained by CDPHE. EPA also posted the plan on its website. A notice of availability of the Proposed Plan and announcement of a public meeting was published in the Clear Creek Courant on May 31, 2006, and the Weekly Register-Call on May 26, 2006. A public comment period was held from June 1, 2006 until June 30, 2006. During the public comment period, the CDPHE accepted written comments by mail and electronic mail. Also, CDPHE and EPA conducted a public meeting on June 15, 2006, at the Gilpin County Courthouse to present the Proposed Plan and to provide an opportunity for interested community members to give oral comments. The proceedings of this meeting were recorded by a stenographer and are also available for public review at the Site information repositories located at the CDPHE and EPA offices.

Presentations concerning the repository were made to the Gilpin County and Clear Creek County Commissioners on May 30, 2006, and June 14, 2006, respectively. The agencies first met with both Gilpin County and Clear Creek County officials in 2002. CDPHE also presented the information regarding the proposed repository to the Upper Clear Creek Watershed Association on May 11, 2006. Presentations summarizing the proposed plan were made to the City of Central on June 6, 2006 at a city council meeting and to interested residents of the Gold Mountain Village Apartments on June 29, 2006.

The Clear Creek County Commissioners, the City of Idaho Springs, the Upper Clear Creek Watershed Association, the Clear Creek Watershed Foundation, and several community members expressed support for the addition of an on-site repository to the ROD. No comments were received in opposition to the addition of an on-site repository.

Several commenters made specific recommendations. The City of Central and several community members advised that no waste should be accepted from outside the Clear Creek watershed. Support for continued use of the Gem Waste Rock Pile as a consolidation area was expressed by the Clear Creek Watershed Foundation, Clear Creek County Commissioners and City of Idaho Springs. Several community members had questions about access, traffic, repository design and the preferred location.

CDPHE and EPA would like to thank all of the people who took the time to review and comment on the various documents related to the on-site repository.

COMMENTS FROM GOVERNMENTAL AGENCIES OR WATERSHED ORGANIZATIONS

COMMENT: City of Central – the City of Central supports the Proposed Plan provided that the Health Department only accept materials that are from the Clear Creek watershed, restricted to Gilpin and Clear Creek Counties with a priority to Central City, followed by Black Hawk, Gilpin County, Idaho Springs and Clear Creek County. The comment further states that: "Because the repository is located in the vicinity closest to Central City, Black Hawk and Idaho Springs, we believe that our request is reasonable. The acceptance of materials outside our area would not benefit any of the entities outlined above."

RESPONSE: CDPHE and the EPA **will not** accept wastes from outside of the Clear Creek watershed, as the repository will be constructed and operated as a remedial component of the Central City/Clear Creek Superfund Site. Materials will be limited to mining-related materials from the Central City/Clear Creek Superfund Site Study Area, which is a subset of the Clear Creek Watershed and also a subset of Clear Creek and Gilpin Counties. As stated in the Proposed Plan, the purpose of adding an on-site repository is to contain mining-related materials generated during the Superfund, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), response actions.

Projects implemented within the Clear Creek/Central City Superfund Site are conducted without political boundaries. Mining-related wastes as well as metals-contaminated water within the Clear Creek watershed have been derived from veins and mine workings that extend across county lines. Projects that provide the most benefit to human health and the environment, as well as to the respective counties, will be implemented regardless of the county or local governmental jurisdiction where the materials originate. Hence we do not plan to prioritize among local government jurisdictions that are located within the Central City/Clear Creek Superfund site, but will limit the repository's use to materials originating from the site.

COMMENT: The Clear Creek Watershed Foundation (CCWF) – concurs with the need for an on-site repository for the consolidation of low-toxicity mine residuals. The CCWF believes that there is a need for the Gem waste rock pile (Gem Site) to continue to be used as a repository for the consolidation of low-toxicity mine residuals. The comment further states that: "The CCWF requests that the preferred alternative be amended to include the continued use of the Gem Site." The CCWF also suggested the Gem site be used as an interim drying and consolidation location for Argo treatment solids until the repository is available.

RESPONSE: The EPA authorized the Clear Creek Watershed Foundation's (CCWF) use the Gem waste rock site for consolidation of mine waste from CCWF projects in an EPA action memorandum. The preferred alternative of adding the on-site repository at the Church Placer property does not affect the action memorandum and EPA authorization. Therefore the Gem mine site will continue to be available for the CCWF projects.

CDPHE and EPA do not plan to use the Gem site as an interim location for treatment solids drying and consolidation pending the availability of a repository. The Argo treatment solids will continue to be disposed off-site until the repository is ready to accept such materials.

COMMENT: The Clear Creek County Commissioners - provided CDPHE and EPA support for the on-site repository at the Church Placer property. The commissioners also commented that: "Until such time that the proposed Druid Site repository is constructed and operational, it is important that the Gem Site consolidation site be supported and available for use to the Clear Creek Watershed Foundation.

Access to the Gem Site is critical to current operations." The Commissioners further commented that: "In addition, it is the opinion of Board of County Commissioners that not every tailings site or waste rock pile should be capped or transported to a repository site. We have many mine waste materials locations that can be treated and managed by proper erosion control measures." The final comment from the Board of County Commissioners was: "Finally, several other mine drainage treatment facilities, in addition to the Argo Water Treatment Facility, will likely be developed in the future. These treatment facilities will require maintenance and cleaning on a periodic basis. The waste materials produced by these activities will also need to be placed into a repository site. The development of a local repository site will enhance the effectiveness of these future operations."

RESPONSE: CDPHE and EPA sincerely appreciate the support provided to us by the Clear Creek County Commissioners. As stated above in response to the comment submitted by the Clear Creek Watershed Foundation (CCWF), the Gem site will continue to be available to the CCWF and its projects involving the relocation of orphan mine wastes to the Gem Site.

Both agencies are sensitive to the historic value of the mining districts within the State of Colorado, and neither CDPHE nor EPA considers every waste rock pile or tailings pile to be an environmental concern. Sources of metals contamination that are considered a problem are prioritized pursuant to criteria such as evidence of erosion and release of metals to the environment, proximity to the stream channel, slope stability, and metal concentration and mobility. Superfund projects have focused on larger piles or reactive piles located near or within streambeds where the cost benefit of the cleanup efforts will be maximized.

In response to the final comment, the agencies plan on utilizing the on-site repository for the placement of solids derived from CERCLA response actions which treat acid mine drainage in both Clear Creek and Gilpin Counties. By doing so, the agencies will eliminate the need to transport this material off-site to landfills.

COMMENT: The City of Idaho Springs - submitted a comment letter stating that it concurs with the proposed ROD amendment with a provision regarding the use of the Virginia Canyon Road as a potential route for transit to the proposed on-site repository. Specifically, the comment was: "The (Virginia Canyon) road is marginal and will not sustain heavy weight traffic. Use of the Virginia

Canyon Road is contingent upon shoring, drainage improvements and paving. Enhancements to the roadway would have to be completed prior to use of this route for use of the cited repositories."

The comment letter further states: " The City of Idaho Springs does not oppose the preferred location of the repository, however, it is imperative that the Gem Mine Waste Rock Pile remain open and useable for drainage and repository projects that currently control run-offs, drainage improvements and remedial waste clean-ups. This site is already in use and the loss of this asset would be detrimental to interests within and adjacent to the City of Idaho Springs."

RESPONSE: The Virginia Canyon Road is one of multiple potential routes to transport materials to a repository, depending on the final selected location of the repository. CDPHE and EPA recognize that it is a fairly steep dirt road and that overuse with heavy weight transport trucks may not be ideal for either the road or as a route for transport. The agencies are exploring other routes, however we do think that the Virginia Canyon Road could be utilized if other alternatives are not available, or where it is the shortest and most direct route. If we do plan on using Virginia Canyon Road, we would coordinate efforts with Idaho Springs and the Counties to assure prior needed improvements are made and to minimize impacts to the road from the mine waste transport. We are of the opinion that the necessary improvements and additional maintenance would be manageable without excessive costs and without requiring the paving of Virginia Canyon road. Virginia Canyon road is the route currently used for transport of materials to the Gem Mine site from Virginia Canyon and the City, and we do not see the condition of the Virginia Canyon Road as prohibitive for use for transport of Virginia Canyon or Idaho Springs wastes to the repository.

The agencies' support for the Clear Creek Watershed Foundation use of the Gem Mine Waste Rock Pile has been provided above in response to the Clear Creek Watershed Foundation and the Clear Creek Board of County Commissioners comments. Provided the CCWF activities continue to be performed in accordance with EPA-approved documents, there is no reason for the agencies to request or require closure or cessation of the Gem Waste Rock Pile for consolidation of orphan mine site materials.

COMMENT: Mr. Ray Rears Gilpin County Planner and Historic Advisory Liaison – has brought to the attention of the agencies that Gilpin County has recently been classified as a Certified Local Government under Section 101(c) of the National Historic Preservation Act, which could necessitate its

review of any historical structures that may be involved, either altered or destroyed, in the proposed cleanup of the on-site repository area and construction of the repository.

RESPONSE: The agencies appreciate Mr. Rears advising us of this new classification. The agencies are sensitive to the historic structures located at the various mines throughout Clear Creek and Gilpin Counties. We will comply with the National Historic Preservation Act, and thus will assess and plan for how to address historic structures or site elements. The agencies will notify Mr. Rears before initiation of the construction of the on-site repository so that the agencies can share our findings and plans regarding historic items and the precautionary measures to be implemented to preserve the historic structures. On similar sites, preservations actions have ranged from documentation (photographs) to full preservation and restoration of structures. At present it is speculative to say exactly what measures will be taken, as this will be a site-specific process that depends on the impacted resource, safety concerns and potential preservation opportunities.

SPECIFIC COMMENTS FROM COMMUNITY MEMBERS

COMMENT: Mr. Larry Thompson, resident of Central City – wanted to advise the agencies that he is opposed to the removal and transport of "tailings" to a pristine environment, especially when some of the "tailings" already have trees growing on them. It is Mr. Thompson's opinion that if the "tailings" are to be moved that they should be re-located to an area that is not pristine.

RESPONSE: The "tailings" that Mr. Thompson refers to are believed to be the waste rock piles with metal toxicity low enough that the piles can support vegetation. The agencies evaluate this carefully as the presence of vegetation is an indication that the piles may not pose an environmental problem and are better left alone.

Only mining-impacted properties were evaluated in the Golder and Associates report (2001) for the siting of an on-site repository because the agencies are sensitive to impacts to pristine areas. An objective of the agencies is to pursue the opportunity to clean up an impacted mine site concurrent with the development of the repository, if possible.

COMMENT: Mr. Dick Ummel, resident of Central City – Mr. Ummel expressed appreciation that the agencies are implementing local mining mitigation projects, such as the repository. Mr. Ummel commented that upgrading the existing bridge access on County Road 279, the road that connects Central City to Black Hawk, would improve the driving conditions of Southern Gilpin County residents, including those living in the apartments and Recreational Vehicle Park.

RESPONSE: If the agencies use this roadway to transport treatment solids to the repository, the agencies will have to address load limitations for this bridge as well as other bridges on County Road 279. It is not currently anticipated that bridge replacement or re-construction would be required to facilitate access to the repository via County Road 279. CDPHE and EPA are continuing to explore routing and truck travel issues and will discuss routing options with appropriate government agencies as better plans are developed.

COMMENT: Mr. James Voorhies, resident of Central City – Mr. Voorhies provided support for the concept of an on-site repository project and he provided the agencies ten comments as follows:

1. Based on the information I currently have, siting of the repository at the Druid Mine/Church Placer does not appear to be the most logical location for a couple of basic reasons:

- Of the 3 sites that are being proposed for a repository, it is stated for the Druid Mine/Church Placer, "During rain storms and snow melt, metals-contaminated surface water and sediment run off the property into South Willis Gulch, a tributary to the North Fork of Clear Creek." and "The Gem Mine and Glory Hole both have significant mining impacts, the potential run-off problems and off-site sediment run-off potential of these do not appear to be as significant as the Druid/Church Placer". It would seem that the other two locations present a better site because of the natural retention of the materials in the waste cells should there be a breach of the system.

- Another beneficial factor for using the Glory Hole site is that the repository would be shielded from view and would not present a visual impact to the surrounding areas. Currently all the mine waste areas present a negative visual impact, but it is expected that the waste areas will be remediated and returned to their natural state.

RESPONSE: The CDPHE contracted with an engineering consulting firm in 2000 to evaluate three mining-impacted properties for the construction of an on-site repository (Golder and Associates, 2001). The evaluation criteria employed included: land ownership; site setting; access; site design; geologic conditions; historic mining use impacts; geotechnical conditions; surface water conditions; groundwater conditions; and regulatory considerations. The Golder and Associates report characterized stormwater flows as having a significant impact on the current Druid Mine site conditions, even though the South Willis Gulch watershed is relatively small. This is due to the presence of acid-generating materials exposed on the site surface, which are preventing vegetation establishment on the site and causing erosion. The Golder and Associates report indicates that stormwater impacts (e.g., erosion, sedimentation) resulting from run-off would be minimized through diversion channels and through terraces, berms or downslope channels as needed. While the Glory Hole site scored higher than the Druid Mine in the surface water drainage/controls category, it ranked lower overall due to access limitations.

The Church Placer property was identified under the Clear Creek/Central City Superfund Study Area OU 4 ROD as a property with significant environmental problems that would be addressed through a response action, whether or not a repository is constructed on the property. The agencies decided that the environmental problems, such as metals-laden run-off, could be addressed with the construction of the repository. The other two properties evaluated, the Gem/Franklin and the Glory Hole, were not identified for a response action. If circumstances prevent construction of the repository at the Druid area/Church Placer claim, the repository may be implemented at either the Glory Hole, Gem/Franklin or another site.

2. How long will the repository be accepting waste material or how long will it be actively operated?

RESPONSE: The on-site repository will have a finite volume. Once this volume is attained, the repository will be capped and vegetated. It is anticipated that the on-site repository will accept waste for a period of about thirty years depending upon the volume of mining-related waste consolidated in the facility. Capping, revegetation and closure will be staged over this timeframe with reclamation of portions of the site occurring as the repository is operated.

3. How long will the facility be monitored after closure?

RESPONSE: CERCLA requires that remedial actions which result in any hazardous substances, pollutants, or contaminants remaining at the site be subject to a Five-Year Review to ensure the protectiveness of the remedy. Five-Year Reviews continue through the life of the site until hazardous substances, pollutants or contaminants no longer remain on site at levels that do not allow for unlimited use and unrestricted exposure. Therefore, the repository will be subject to the Five-Year Review requirement in perpetuity.

As part of the design, a facility maintenance and monitoring plan will be developed. This plan will detail the frequency of ground water and surface water monitoring and surface water controls and final cover inspections. Typically, these activities are scheduled with greater frequency initially after facility closure and decrease in frequency following a sufficient period of demonstrated performance.

4. What is the source of funding for the project from initial activities (remediation of the site), operation of the repository (acceptance of materials), closure (capping and revegetation), and future monitoring?

RESPONSE: In accordance with CERCLA Section 104, where there are no responsible parties to finance the remedial action, the federal government funds ninety percent and the State funds ten percent of clean up costs. This funding arrangement will continue until the CERCLA response action is complete. After the repository is operational and functional, ongoing operation and maintenance activities are paid by the State in perpetuity. The State funds used for CERCLA actions are derived from fees on solid waste disposal.

5. Who will be allowed to dispose of waste in the repository? Will the repository only accept waste from abandoned mine/mill sites? If the waste comes from an operating mine/mill will they have to pay for disposal fees and other impact fees? Who would receive the monies?

RESPONSE: As stated in the Proposed Plan, the purpose of adding an on-site repository is to contain mining-related materials generated during the Central City/Clear Creek Superfund, or Comprehensive

Environmental Response, Compensation, and Liability Act (CERCLA), response actions. Any mine waste material proposed for consolidation into the repository not already identified for remediation in the OU 3 or 4 RODs would require approval by the EPA and the State to assure the repository use be limited to appropriate mine wastes. Such determinations would be made either on a case-by–case basis or through additional development of acceptance criteria and policy. Other considerations, including repository capacity, may be important factors.

The repository will only accept mining-related materials such as waste rock, mill tailings, treatment facility solids, or metals-contaminated sediment from sediment retention basins located within the Central City/Clear Creek Superfund Site.

Wastes from an operating mill **will not** be accepted in the repository. Disposal of wastes from an operating mill would be the responsibility of the mill operator and not the State or EPA. CDPHE and EPA are exploring a public/private venture to treat mine drainage water that would include treating Gregory Gulch and Gregory Incline waters along with the private party's mine dewatering water. We have contemplated the potential for these treatment solids, which will be very similar to solids produced at the Argo Water Treatment Facility, to be disposed of at the repository.

6. What is the expected traffic volume to and from the site during full operation?

RESPONSE: It is expected that typical, or "baseline", truck traffic would consist of up to one truck per day transporting treatment solids to the repository from the Argo Water Treatment Facility in Clear Creek County and up to one truck per day transporting treatment solids from Gilpin County. Traffic associated with removing mine waste piles and relocating the material to the repository is harder to predict. Traffic associated with removal actions would be localized to the route(s) from the mine waste being removed to the repository. At this time the agencies have not determined how may waste rock piles would be removed and re-located at the repository. Some materials are close to the preferred repository site and would have very limited routes. Others potential source of materials such as Nevadaville or Virginia Canyon, would most likely involve some transport along Road 279, and then to the repository location. Removal of mine waste piles would be for limited duration, but would involve multiple trips per day. Efforts will be made to be sensitive to the local community and to minimize the truck impacts and traffic.

7. Will the project be hiring local residents (with a stake in the success of the project), or will the workforce be strictly outside contractors?

RESPONSE: The construction of the repository will be by open competitive bid. All qualified bidders will be encouraged to bid on any or all phases of the project. Having person with local knowledge may be of benefit to potential bidding firms, but would not be required by the bid documents.

8. Will this facility be a GOCO (government owned/contractor operated) or strictly a government owned and operated facility? Are there plans to contract any part of the operation (initial, ongoing, closure, post closure monitoring)?

RESPONSE: Once the CERCLA response action is complete, the State will accept title of the repository property from EPA. The CDPHE will bid the construction phase of the project pursuant to the State procurement requirements. The design engineering firm, to be hired by the State, will provide an operations and maintenance document that will dictate how the facility is to be operated, material placed, maintained, and closed. The operation of the facility will also be competitively bid, unless a local governmental entity is interested in operating it. It has not been determined whether operations would be incorporated into operations of the Argo Water Treatment Facility or whether the repository would be operated by a separate contractor.

9. What criteria will be used to determine the success of the project? What assurances will the government (federal and state) give to the local communities for the successful completion of the contract? Who will be held accountable for non-success, non-completion, failure of the containment, accidents, etc. What could the penalties be for non-success, non-compliance, or failure of the containment?

RESPONSE: The repository construction and operation are a CERCLA remedial action, and success criteria are those set forth in CERCLA. As part of the design, a facility maintenance and monitoring plan will be developed. This plan will detail the frequency of ground water and surface water monitoring and surface water controls and final cover inspections. Typically, these activities are

scheduled with greater frequency after facility closure and decrease in frequency following a sufficient period of demonstrated performance.

If there are problems with the facility or the cap either during operation or after closure, the remedy will be reevaluated in accordance with CERCLA criteria. If additional remedial actions are needed, the State and EPA will be responsible for implementing the additional needed action.

The facility will be designed, constructed, operated, and monitored as the on-site repository is operated through its lifetime and into perpetuity. Adjustments will be made to the design and operation of the facility as needed and after closure of the repository to insure that the facility is successful.

10. This is a proposal to clean up and remediate sites within Gilpin and Clear Creek Counties. NO concessions or agreements should be made to accept any waste from any other jurisdiction. Wastes that are proposed for the repository are listed as " materials that are subject to Superfund response actions to be consolidated within an on-site repository that would be constructed within the Clear Creek/Central City Superfund Study Area. More specifically, these materials include tailings and waste rock piles, sediment from sediment control structures and solids from the treatment of acid mine drainage in Clear Creek and Gilpin Counties". Though some materials may exhibit similar characteristics as those materials proposed for disposal (solids from sanitary wastewater, chemical wastes from non-mining processes, construction and demolition waste). These should not be allowed for disposal in the repository now or in the future. Any waste that is not locally generated should not be acceptable at this facility.

RESPONSE: As mentioned above, the CDPHE and EPA **will not** accept wastes from outside of the Clear Creek watershed, as further limited by the Central City/Clear Creek Study Area. The fact that this is a CERCLA response action to address the Clear Creek watershed precludes this repository from taking such materials. Additionally, proposals to relocate mining-related wastes to the on-site repository that are not already identified as priority wastes by OU3 or OU4 will require CDPHE and EPA review and approval as CERCLA response actions. Waste material that contains any waste other than waste rock or tailings will not be allowed to be re-located into an on-site repository.

COMMENT: Mr. Fred Morin, resident of Gilpin County – Mr. Morin provided several comments regarding the on-site repository project as follows:

1. What roads are the trucks going to use? It would be practical to use the Laubhaun road as it is fairly flat to the site and it comes out on the upper part of the Church claim. The Frontenac road has a hill that drifts over quite a bit with the snow and would be hard to plow uphill at this point.

RESPONSE: Many decisions are involved in the siting of a repository. While the Druid area/Church Placer Claim the preferred location, the agencies have not determined the final location nor selected a specific roadway(s) for truck haulage and are exploring all options of ingress to the property.

2. Why are you going against the EPA's own regulation of the maximum 7 percent allowable grade, the area has a 15 percent grade.

RESPONSE: It is not clear what grade Mr. Morin is referring to with this comment. If the grade he is referring to is associated with the on-site repository, the agencies have not set any requirements for grade. Grades and side-slope configurations for the on-site repository will be provided as the design progresses and will be based upon sound engineering criteria.

3. It would be a good idea to have a person act as a liaison between the companies and the landowners to resolve problems. This is what was done when the Glenwood Canyon was built and it kept things at a minimum amount of complaints.

RESPONSE: The State and EPA Project managers will serve as the primary liaisons with the public. If this proves to be insufficient, alternative communication and community involvement means will be considered. CDPHE and EPA are committed to having and maintaining good relations with nearby landowners. We intend to share design and operational plans in order to receive comment and input. Outreach efforts will be tailored to community interest and requests.

4. How many trucks? This is a good question as there are some landowners who have had their homes damaged from the trucks rumbling in front of their homes. And what about the heavy

construction equipment? We know that you have to fuel trucks going up and lowboy trucks, so it's not just the trucks hauling the tailings but the secondary units also?

RESPONSE: At this time, it appears that there will be up to two trucks per day hauling treatment solids to the repository on a longer-term basis. The number of trucks hauling waste rock from waste rock piles is harder to accurately predict. Waste pile removals will be of limited duration, but would involve multiple truck trips per day when being implemented.

The agencies are sensitive to truck noise, damage caused by truck traffic, and dust, and will take practicable measures to minimize these problems. The agencies recognize it will be important to work with the local community to minimize impacts and address concerns.

5. The area under the Church claim is heavily undermined it will cause the ground to cave in. I have personally seen some of the underground workings.

RESPONSE: The Repository Site Characterization Assessment (Golder and Associates, 2001) evaluated maps of the underground workings associated with these mines and concluded that if the repository is designed to avoid the areas underlain by the mine workings associated with the shafts along the southern border of the site, there is negligible potential for geotechnical hazards such as subsidence, settlement, or caving. Information concerning the location of underground workings is critical to the design of the on-site repository and the agency representatives certainly want to avail themselves of any available information. If circumstances permit the construction of the repository at the Druid Mine area/Church Placer Claim, the agencies and engineering firm that will design the repository are willing to meet with Mr. Morin to review any information he has about the location of underground workings.

6. Are you aware of the new congressional bill being pushed thru congress on cleanup issues?

RESPONSE: The bill Mr. Morin may be referring to is the proposed "Good Samaritan" legislation. Though there are multiple "Good Samaritan" proposals, including one advanced by EPA, the common theme of the "Good Samaritan" concept is to allow volunteer cleanups of abandoned mine sites without significant potential liabilities as could occur under current Clean Water Act laws. The agencies will

continue to conduct response actions within the Central City/Clear Creek Superfund Study Area mindful of whatever legislation on this topic becomes law.

7. It may be possible to implode the Druid and Kokomo mines into a very large glory hole to fill in.

RESPONSE: If circumstances permit the repository construction at the Druid Mine area/Church Placer Mine and if the design process determines that the implosion of the Druid and Kokomo Mines is a reasonable avenue, it will be pursued. At this time, it is likely beyond the scope of what is necessary to perform the CERCLA response action.

The CDPHE contracted with an engineering consulting firm in 2000 to evaluate three mining-impacted properties for the construction of an on-site repository (Golder and Associates, 2001). The Glory Hole in Gilpin County was assessed. While it would provide a large volume repository, the consulting firm advised that placement and spreading of materials into the Glory Hole would be an engineering and operational challenge due to pit depth, instability of the pit walls, and limited access.

8. The water flowing off this area (referring to the Druid Mine area) is very fast and furious [sic] it could destroy some of the infrastructures that are in place.

RESPONSE: The comment is noted. One of the first tasks associated with the construction of the on-site repository, regardless of location, will be run-off control during storm events. The design of the facility will define what methods will be used to address run-off and prevent or control erosion.

9. We do not want any of the historic mines destroyed in the name of safety. They have a historic value just like any old buildings.

RESPONSE: The agencies are sensitive to the historic significance of mines and associated structures and have no desire to destroy mines and structures during the construction and operation of the repository and site cleanup. Some waste rock piles from mines will be removed or regraded however. The agencies will comply with the National Historic Preservation Act.

10. The Druid, Kokomo, and Frontenac Mines that are open could be contaminated by seepage from the repository into the openings.

RESPONSE: If the repository is constructed at the Church Placer area/Druid Mine, the repository would be designed to avoid the area underlain by the mine workings associated with the shafts along the southern border of the site. Additionally, a liner and leachate collection system will be placed at the base of the on-site repository to contain any leachate (liquids generated from storm water contact with the waste prior to the cover being constructed).

11. How will you be able to dry this stuff (reference is to treatment solids) with all of the snow and rain the site will get?

RESPONSE: Golder and Associates, under contract to the CDPHE, conducted a small-scale test of drying solids generated from the Argo Water Treatment Plant from August 20, 2002 through October 4, 2002. It was found that once dried, the solids did not re-hydrate and therefore rainfall did not significantly affect moisture content. The moisture evaporated from the surface. Rain and snow would be expected to slow the drying process, however, this factor and other site-specific considerations will need additional study during design to help better define sizing and staging procedures.

COMMENT: A Central City Town Council Member and a resident inquired about the potential removal of the Quartz Hill tailings pile to the repository at the June 6th, 2006 Town Council meeting.

RESPONSE: Tetra Tech RMC, which was contracted pursuant to the OU 3 Record of Decision to design an in-place closure for Quartz Hill, was also tasked to estimate removal costs. Tetra Tech RMC engineers estimated 60,000 cubic yards of materials would require removal to match the elevation of Nevada Street. The estimated cost of transporting this amount of material to the repository and capping and grading the site is $1.8 million. Additional material would have to be hauled off if a complete removal were desired. This compares to an estimate of approximately $870,000 for regrading and in-place closure at the site without removal (both estimates are for remediation of the tailings and do not include other items such as stormwater controls around the site). The cost to conduct removal of the pile is significantly higher than capping the pile in place. Therefore CDPHE and EPA continue to recommend in-place closure for Quartz Hill.

With the large volume of Quartz Hill material and because the repository has other planned uses, the repository would probably not be able to accommodate complete removal of Quartz Hill materials. If new information warrants it, acceptance of some material from Quartz Hill at the repository could be considered. In any event, CDPHE and EPA hope to work constructively with landowners and the City of Central to facilitate a remediation of the Quartz Hill mine waste pile that reduces the amount of mine materials eroding from the site, is protective of the environment and otherwise fits in with future use of the property.

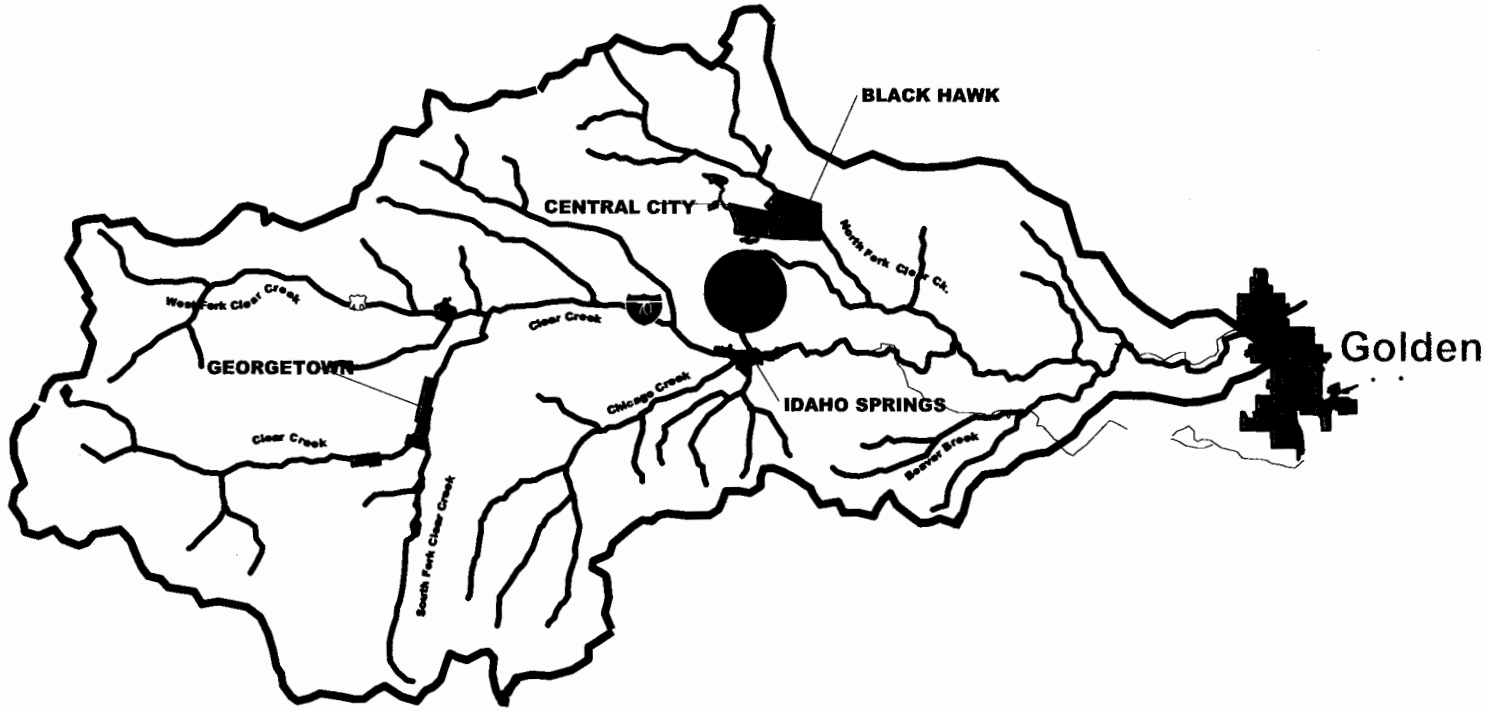
COMMENT: A resident of the Gold Mountain Village Apartments asked the CDPHE presenters at the June 28th, 2006 meeting what the repository would look like upon completion.

RESPONSE: This question will be answered more completely as the repository design is developed. The agencies will take into consideration the visual appearance of the repository. Regardless of location, the repository will likely be constructed and operated in phases with discrete areas constructed, filled and closed. Vegetating the repository should result in significant improvement to visual appearance over current conditions if the repository is build on a mining-impacted property, as preferred. Care will be taken with regard to final topography have to avoid an unnatural appearance as much as possible. We anticipate discussing the design with interested parties to incorporate input before finalizing design.

COMMENT: A comment and much of the discussion during the Gold Mountain Village Apartments related to the residents' comment that they hope that the repository project would help facilitate the addition of the exit from the Central City Parkway in the vicinity of the apartments.

RESPONSE: The construction of an exit from the parkway in the proximity of the Gold Mountain Village is an issue that is separate from and beyond the scope of the repository project. Having the ability to use the parkway as a means of transporting treatment solids from Idaho Springs to the repository may be positive, and the agencies intend to further discuss this possibility with Central City. We also believe other manageable alternatives exist in the event that access from the parkway is ultimately not available.

CLEAR CREEK WATERSHED



Area Contains Potential Repository Sites

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4 2 0 4 8 Miles

FIGURE 1.

CLEAR CREEK/CENTRAL CITY SUPERFUND SITE

OU3 & OU 4 ROD AMENDMENT

ON-SITE REPOSITORY PROJECT

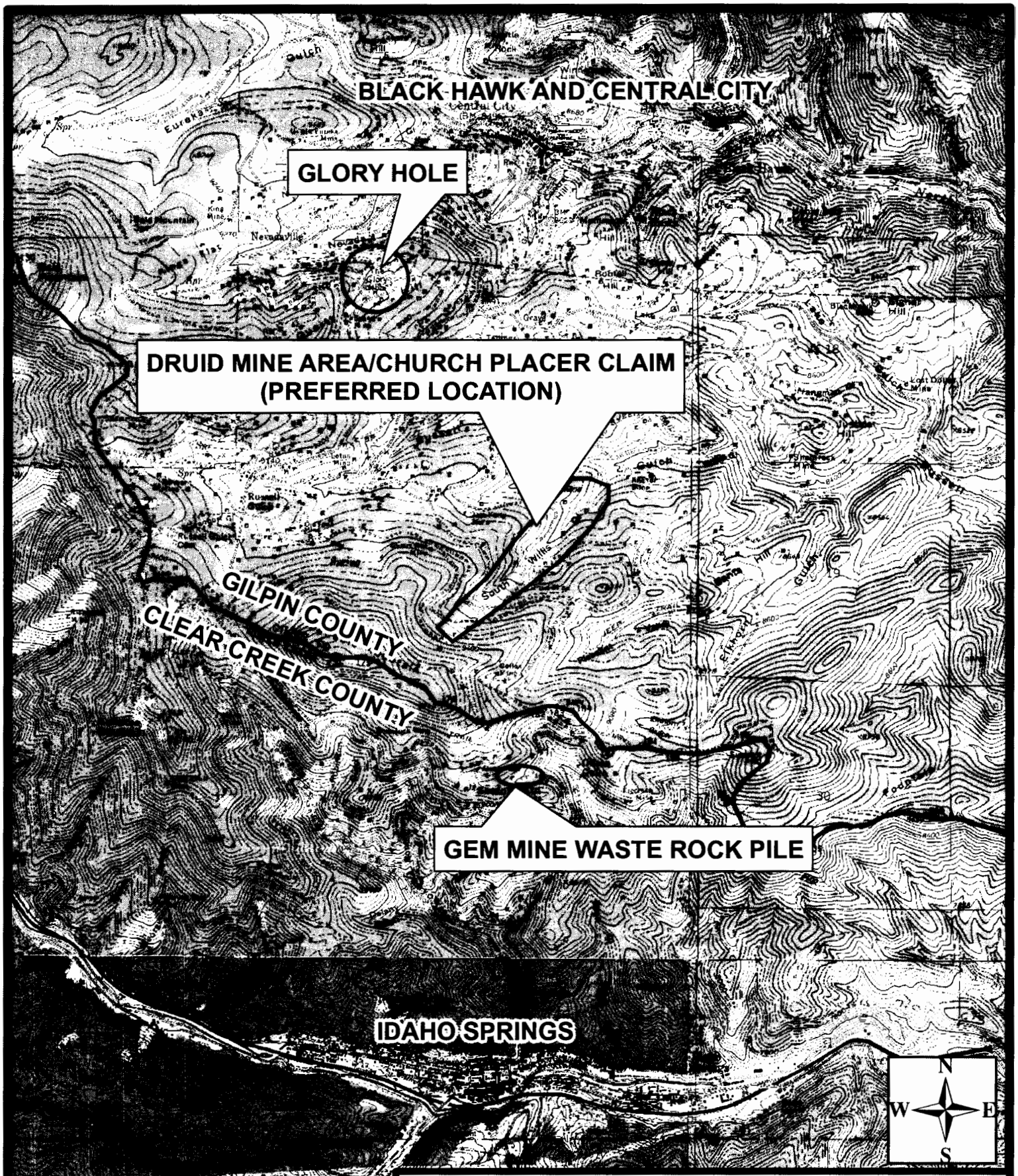

FIGURE 2.

AMENDMENT TO THE OU 3 AND OU4 RECORDS OF DECISION

POTENTIAL REPOSITORY LOCATION MAP