

FIVE YEAR REVIEW REPORT

First Five-Year Review Report
for
Eureka Mills Superfund Site
City of Eureka
Juab County, Utah

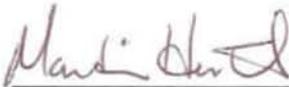
September 2008

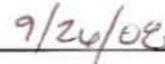
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LIST OF ACRONYMS

aka	also known as
AR	Atlantic Richfield
ARAR	Applicable or Relevant and Appropriate Requirement
BHHRA	Baseline Human Health Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	contaminant of potential concern
EBB	Eagle Blue Bell Mine, Transition & Dump
EC	Environmental Covenant
e.g.	for example
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FS	feasibility study
IEUBK	Integrated Exposure, Uptake and Biokinetic Model
Inc	Incorporated
KC	Knightsville Channel
MCL	Maximum Contaminant Levels
µg/dL	micrograms per deciliter
mg/kg	milligram per kilogram
N	No
NLMC	North Lily Mining Company
NPL	National Priorities List
O/M	Operation and Maintenance
OU	operable unit
ppm	parts per million
PRG	preliminary remediation goal
PRP (Respondent)	Potentially Responsible Party
QC	Quality Control
RA	Remedial Action
RAO	Remedial Action Objective
RAS	Response Action Structure
RAWP	Remedial Action Work Plan
RD	Remedial Design
RI	Remedial Investigation
ROD	record of decision

RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SSC	State Superfund Contract
UAO	Unilateral Administrative Order
UDEQ	Utah Department of Environmental Quality
UDOH	Utah Department of Health
UEG	Upper Eureka Gulch
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WIC	Women, Infants & Children
Y	Yes

EXECUTIVE SUMMARY

The remedy for the Eureka Mills Superfund Site in Eureka, Utah includes the grading and capping of mine waste piles; the excavation and replacement of 18 inches of soil in residential areas where lead contaminated soils are found; the implementation of institutional controls and implementation of public health actions until the remedy is in place. The remedial action is still being implemented at the Site and is expected to be completed in 2010.

This Five Year Review was conducted in accordance with the NCP; 40 CFR §300.430(f)(4)(ii). This review found that the remedy is being implemented in accordance with the requirements of the Record of Decision (ROD) and the completed portions of the remedy are functioning as designed. The remedy is expected to be fully protective once the remedial action is completed.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Eureka Mills Superfund Site		
EPA ID (from WasteLAN): UT0002240158		
Region: 8	State: Utah	City/County: Eureka/Juab County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input checked="" type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date: 2010 (est.)	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Paula Schmittziel		
Author title: RPM	Author affiliation: USEPA – Region 8	
Review period:** 04/25/2008 to 09/30/2008		
Date(s) of site inspection: 05/07/2008		
Type of review: <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input checked="" type="checkbox"/> Actual RA Start at OU#_01 <input type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
Triggering action date (from WasteLAN): 06/20/2003		
Due date (five years after triggering action date): 06/20/2008		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Summary of Site Issues

The following issues were identified during the Site Inspection at Eureka Mills Superfund Site.

	Issues	OU	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1	O/M manual is not in place so O/M is not occurring	All	Y	Y
2.	Resolution of O/M Responsibilities w/the State	All	Y	Y
3	Minor displacement of roadbase on several sections of Eagle Blue Bell access/haul roads	03	N	Y (But not likely to be much of a problem since area is flat)
4	Minor rutting/erosion of roadbase on access road to Chief Mine #2	03	N	Y
5	Gemini mine waste pile – lock on gate to Bullion Beck mill not working	02	N	N
6	Surveying of points on welded wire retaining wall on Gemini mine waste pile	02	N	Y (Unknown if wall is shifting w/out confirming thru surveying - Required by O/M manual)
7	Upper Access Road to May Day mine waste pile is eroding at turn-off from Knightsville road	01	N	Y (Road was constructed to access May Day waste pile – if maintenance of pile cap requires access w/equipment)
8	Gate and fencing on May Day access road has been vandalized	01	N	Y (Not critical unless vandalism to cap occurs)
9	Erosion/rilling of roadbase on access road to Lower Knightsville Sedimentation Pond, KC-2	03	N	Y
10	Implementation of institutional control – local ordinance & rest of ECs should be filed at county	All	N	Y
11	Noxious weeds should be removed from UEG	00	N	Y

Recommendations and Follow-up Actions for Site Issues

	Recommendations & Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date
1	EPA & State finalize O/M manual so O/M can commence	EPA	EPA	10/31/2008
2.	Resolve O/M Issues w/State & revise SSC	EPA & State	EPA	October'2008
3	Re-grade sections of Eagle Blue Bell access/haul road **	EPA	EPA	12/312008
4	Re-grade & compact roadbase on access road; divert runoff away from road where it is eroding	Spentst Hanson	EPA	June 2009
5	Repair or replace lock	Spentst Hanson	EPA	June 2009
6	Survey retaining wall	Spentst Hanson	EPA	June 2009
7	Repair rutting on May Day access road with armor rock in "Texas-style" crossing	Spentst Hanson	EPA	June 2009
8	Repair/replace or re-consider fencing along May Day access road	Spentst Hanson	EPA	June 2009
9	Work with Juab County to address drainage issue along Knightsville road.	EPA	EPA	June 2009
	Repair erosion of roadbase on access road to KC-2 sediment pond –	TBD	EPA	TBD
10	Adopt ordinance & set up administration of ordinance ***	City of Eureka	EPA	08/31/2009 (or sooner)
	File remaining ECs on RASs at County Recorder's Office^^	EPA & Spentst Hanson	EPA	03/31/2009
11	Remove weeds	City of Eureka	EPA	04/30/2009

** EPA is using sections of access/haul road for project work and will maintain while RA work is in progress.

*** Depends on resolution of funding of ICs and other O/M issues with State.

^^ Depends on resolution of language with State for ECs yet to be filed.

Protectiveness Statements:

As discussed in the main body of the Five Year Review report, the RI/FS for Operable Unit (OU) 04 is still underway so a final determination of ecological risk and groundwater contamination has not been made. The ecological risk assessment and RI/FS for groundwater will be completed in 2009. The ROD for OUs 00-03 only addresses human health exposure.

OU-00 Site Wide including Residential Areas:

The remedy (residential soil removal) at OU-00 is still under construction with approximately 70% complete. The remedy is expected to be protective of human health once the RA is completed and the institutional controls (local ordinance) are implemented. In the interim, exposure pathways that could result in unacceptable risks remain uncontrolled. However, regular blood lead testing and public health education are being implemented to mitigate those risks.

OU-01 May Day – Godiva Shaft and Tunnel:

The remedy at OU-01 is currently protective of human health because the large mine waste piles in OU-01 have been capped. However, for the remedy to remain protective in the future, the following actions should be completed:

- The minor erosion issues noted above should be addressed
- Environmental Covenants (ECs) for OU-01 that have not yet been recorded at Juab County should be filed to ensure the remedy remains protective.

OU-02 Bullion Beck – Gemini Mine Waste Piles:

The remedy at OU-02 is currently protective of human health because the mine waste areas have been capped. However, for the remedy to remain protective in the long-term, operation and maintenance activities should be implemented including the surveying of the retaining wall to ensure it has not shifted and the filing of the unrecorded ECs for OU-02 with the Juab County Recorder's office.

OU-03 Central Eureka Mining Areas:

The remedy at OU-03 is expected to be protective of human health once the RA is completed and the Environmental Covenants have been filed. Until construction is complete for the entire OU, the exposures pathways at some RASs in OU-03 that could result in unacceptable risks remain uncontrolled. However, regular blood lead testing and public health education are being implemented in the community even though no one lives directly on this Operable Unit.

I. INTRODUCTION:

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of this review are documented in this Five-Year Review report.

The Agency is preparing this Five-Year Review report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the first five-year review for the Eureka Mills Superfund Site (Site). The triggering action for this statutory review is the initiation of the first remedial action (RA) on June 20, 2003. The five year review is required because hazardous contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. This five year review will encompass the entire Site to establish one review schedule for the entire Site.

II. SITE CHRONOLOGY

The following table presents the major milestones since the project began.

TABLE 1 - CHRONOLOGY OF SITE EVENTS	
EVENTS	DATE
Joint State Site Inspection/EPA Removal Site Assessment - soil/mine waste testing	7/2000
Central Utah Department of Health Blood Lead Testing (WIC program)	7/2000
Blood Lead Testing showed high percentage of children w/elevated blood lead	7/2000
Soil/mine waste testing showed extremely high levels of heavy metals incl. lead and arsenic	7/2000
EPA Emergency Response and Remedial Response programs initiate an extensive sampling of residential soils and mine waste areas in and around Eureka. Public meeting is held in August 2000 to inform the public of EPA's actions.	Summer/Fall 2000
EPA, UDOH, & ATSDR initiate an extensive blood lead testing program of all children and adults in Eureka. Testing includes sampling the interiors of a subset of households for indoor exposure pathways.	Summer/Fall 2000
EPA initiates an RI/FS for site	Fall 2000
EPA prepares Action Memorandum to conduct Removal Action at select residential properties.	Winter 2001
EPA commences Removal Action at selected residential properties with soil lead levels >3000 ppm.	Spring/Summer/Fall 2001
EPA proposed the site for listing on the National Priorities List.	06/14/2001
EPA completes Baseline Human Health Risk Assessment	9/2001
RI/FS released to public	Summer 2002
Proposed Plan identifying EPA's preferred remedy is made available for public comment. Public meeting is held during public comment period.	7/2000
Final listing on EPA National Priorities List	9/05/2002
ROD selecting remedy is signed.	9/30/2002
EPA settles with North Lily Mining Company in bankruptcy court for access to land parcels for borrow material and for some water rights.	???? 2003
EPA proceeds with Remedial Design (RD) in Fall 2002. EPA completes RD.	5/23/2003
EPA issues UAO to PRP(ARCO) for conduct of Remedial Action @ OU 00, 01 & 03. ARCO complies with UAO on 6/20/2003.	6/20/2003
EPA signs SSC with State for conduct of fund-lead RA for OU-02 - i.e., Gemini- Bullion Beck mine waste area	08/25/03
EPA commences fund-lead RA at OU 02 using USACE to perform work. USACE has Shaw Environmental Inc. as their primary contractor.	9/03/2003
Consent Decree w/Spent Hansen, Keystone Surveys, Godiva Mines, etc. is approved by the Court.	04/07/2004
ARCO Consent Decree (CD) approved by the Court with the reduced SOW from the amended UAO.	1/2005
EPA signs SSC with State for conduct of fund-lead RA for the whole Site including OU-02 but minus the PRP-lead areas.	07/12/04
ARCO completes all work on-site per CD SOW. EPA and the State conduct Pre-final Inspection. AR is released from any further obligations at the Site.	9/2004
EPA completes all work on OU 02 on-site. EPA and the State conduct Pre-final Inspection.	10/2004
EPA commences residential cleanup in OU 00.	7/22/2004

TABLE 1 - CHRONOLOGY OF SITE EVENTS	
EVENTS	DATE
Consent Decree w/Chief Consolidated Mining Co. is approved by the Court.	01/27/2005
UPRR (PRP) commences work on Upper Eureka Gulch under CD-SOW. A 2nd component of UPRR's SOW is to operate Lime Peak Quarry to produce 2 years of rock materials for EPA. Shaw Environmental, Inc, under contract to USACE holds the mine permit from the State and authorized UPRR to operate the quarry.	6/2005
ARCO submits final Construction Completion/RA report for OU 01 & EPA approves report. ARCO per its CD is released from any further obligations at the site.	9/04/2005
EPA submits final Construction Completion/RA report for OU 02 and report is approved.	9/30/2005
UPRR Consent Decree is approved by the Court.	11/14/2005
EPA continues residential cleanup and commences cleanup of other mine waste areas & construction of drainages, haul roads & Open Cell.	2004 - 2008
EPA completes remediation of Eagle Blue Bell, Snowflake & Eureka Hill mine waste areas	Fall 2006
UPRR completes all physical work on-site and EPA & the State conduct a Pre-final Inspection.	Fall 2006
EPA approves all UPRR work and releases it from further requirements.	8/2007
UPRR submits final Construction Completion/RA report for Upper Eureka Gulch and the report is approved by EPA. UPRR transfers its land parcels in Eureka to the City. UPRR per its CD is released from any further obligations at the site.	8/2007
EPA expect to complete the RA of both residential and mine waste in 2010 depending on funding and level of increased costs.	2011

III. BACKGROUND:

III.A. PHYSICAL CHARACTERISTICS

The Eureka Mills Superfund Site is a historic mining site that comprises much of the town of Eureka and some of the adjacent areas in Juab County, Utah. Mining for silver and gold and other minerals began in Eureka in the 1870s and continued until 1965 when mining activities significantly declined.

The Site remediation encompasses approximately 450 acres and includes the residential and commercial parts of Eureka and some adjoining areas outside of the City limits. Numerous large waste rock piles and associated waste materials from mining operations remain in the area. They are located primarily on the south side of the Eureka valley and at the western edge of Eureka, near the town's residences and businesses. Mine waste has been distributed around Eureka by activities associated with mining such as transport along rail lines and milling operations. Due to the steep slopes of the valley, some of the waste pile

material has been used for residential construction in Eureka which has resulted in the distribution of mine wastes throughout the town. Wind and water erosion have also contributed to the extent of contamination at the Site.

III.B. LAND AND RESOURCE USE

Eureka is located in North Central Utah approximately 45 miles southwest of Provo at the edge of the Utah desert. Figure 1 shows the location of Eureka in relation to Salt Lake City and Provo, Utah. Eureka receives approximately 13 inches of precipitation annually in the form of rainfall and snow. The current land use of the Site is primarily residential with some associated commercial uses (gas stations, convenience stores, restaurant, etc.). Eureka currently has approximately 800 residents. There are some open areas within the Eureka city limits that are being individually developed into residential properties.

The City of Eureka provides municipal water for all residents from a series of wells that are located 1-4 miles outside of town. The City's regular sampling program has shown that the aquifers from which they are drawing their water are of very good quality without any contamination. Because of the complex geology, it is not expected that the City's water supply wells would be affected if the groundwater underlying the Site were found to be contaminated.

III.C. HISTORY OF CONTAMINATION

Since 1965, when mining in Eureka ended, the town's economic base has steadily declined leaving very few local jobs. Most residents commute 40-60 miles away to jobs in the Provo valley or to Dugway Proving Grounds or Tooele Army Depot. The State of Utah discovered contamination at the Site when conducting a Site Inspection in July, 2000 and collected a number of mine waste and residential soil samples for analysis. Concurrent with the Site Inspection, the Central Utah Public Health Department conducted blood lead testing on 18 children in Eureka under the WIC Program (Women, Infants & Children). Eleven of the 18 children had elevated blood lead levels above the health-based level of concern established by the United States Centers for Disease Control (10 µg/dL). All of the mine waste and soil samples showed extremely high levels of lead & arsenic.

III.D. INITIAL RESPONSE

Based on the results of the initial blood lead testing and soil sampling, EPA and the State initiated an extensive blood lead testing program for residents of Eureka in the summer of 2000. In addition, EPA's Emergency Response program initiated an extensive soil sampling program of residential properties and mine waste areas. The Site was proposed for the National Priority List (NPL) on June 14, 2001 and finalized on the NPL on September 5, 2002.

During 2001 and 2002 construction seasons, EPA's Emergency Response program conducted an emergency removal action on 71 properties – removing and replacing up to 18 inches of soil high in lead content on each property. The properties selected for emergency removal were based on soil lead levels greater than 3000 ppm and/or a child living in the home with a blood lead level greater than 10 µg/dL. Additionally, EPA and the Utah Department of Health (UDOH) initiated an on-going quarterly blood lead testing program that continued till spring of 2008. A summary of the blood lead testing is in Appendix A.

III.E. BASIS FOR REMEDIAL ACTION

In 2002, EPA completed a Baseline Human Health Risk Assessment (BHHRA) for the Site that evaluated the current and future risks to human health associated with elevated concentrations of metals in soils and mine waste within the Site. The BHHRA identified the following Contaminants of Potential Concern (COPC) in the soils and mine waste materials: lead, arsenic, antimony, mercury and thallium. The COPC are co-located in the soils and mine waste materials so all contaminants can be addressed through the same response actions.

In the BHHRA, the Integrated Exposure, Uptake and Biokinetic Model (IEUBK) predicted the 95 percentile of the blood lead values to range from 11 µg/dL to 101 µg/dL with a community-wide average of 33 µg/dL. The predicted incidence of children with blood lead levels greater than 10 dg/dL was 69%. Based on these findings, 100% of all residential properties in Eureka are above EPA's health-based goal of a probability that there would be less than a 5% chance that a child would have a blood lead level over 10 µg/dL.

The remedy selected in the first ROD only addresses the remediation of the mine waste areas and residential soils as they relate to human exposure. EPA is currently conducting an ecological risk assessment and groundwater/surface water RI/FS which will assess the impacts of the Site on the underlying aquifer(s).

III.F. CURRENT STATUS OF THE SITE

The Remedial Action (RA) commenced in 2003, and is still underway. Assuming adequate funding, EPA expects to complete the implementation of the selected remedy in 2011.

The major mine waste piles, constructed drainages, sediment ponds and haul/access road are referred to a "Remedial Action Structures" (RAS). Figure 2 shows the location of the RASs in relationship to the residential areas. The Site boundary and City limits are also included in this figure.

There are 5 operable units (OU) at the Site listed as follows:

- OU 00 – Site Wide covers the entire site including the residential areas
- OU 01 - May Day – Godiva Shaft and Tunnel

- OU 02 - Bullion Beck – Gemini Mine Waste Piles
- OU 03 - Central Eureka Mining Areas (Chief Consolidated Mining Company)
- OU 04 – Ecological Risk Assessment & Groundwater

Figure 3 shows the boundaries of Operable Units 00-03.

Figure 4 shows the RAS' that have been constructed and are subject to operation and maintenance requirements. Figure 5 shows the locations of the RAS drainage features and Figure 6 shows the locations of the RAS access & haul road features. Because EPA is currently using both the Chief Mill Site No. 1 haul road and the Open Cell access road to facilitate the Remedial Action, those two RASs are not yet ready to be turned over for operation and maintenance. Table 2 provides the acreage and volume of mine waste material for each RAS.

TABLE 2 – AREA AND VOLUME OF MINE WASTE MATERIAL FOR RASs			
Response Action Area	Description of Response Action	Response Action Area (Acres)¹	Volume of Waste (CY)²
Chief Mine #1 + Repository	Contour & Cap	23.69	616,000
Chief Mill Site # 1/Chief Mill Tailings	Contour & Cap	18.69	0
Eureka Hill/Eureka Hill Waste Rock	Contour & Cap	7.24	195,002
Eagle and Blue Bell Mine & Transition	Contour & Cap	16.89	399,071
Snow Flake/Open Cell (Including Residential Waste in Berms)	Contour & Cap	7.05	155,376
May Day/Godiva	Contour & Cap	6.62	287,033
Chief Mine # 2	Contour & Cap	3.51	48,146
Gemini & Bullion Beck Mine & Mill	Contour & Cap	25.15	388,598
Upper Eureka Gulch	Contour & Cap	12.90	0
Drainage Gulches/ Haul Roads and Sedimentation Ponds	Excavate, Contour and Cap	17.58	0
Total		139.32	2,089,225

Notes:

1. From Remedial Design
2. From Feasibility Study

The remedy selected in the Record of Decision (ROD) in September 2002 for human health addresses residential and mine waste areas in OUs 00 thru 03. A separate ROD will be issued for OU 04 upon completion of the ecological risk assessment and RI/FS for groundwater and surface water.

III.G. PRP STATUS

There are 5 potentially responsible parties (PRPs) identified at the Site who have settled their liability with EPA in a Consent Decree. The Settlements with three of the PRPs were based on an "Inability to Pay." The two other PRPs settled their liability by performing work on areas of the Site where they had liability and paying EPA cash to settle their remaining liability. For complete information on each PRP's settlement, refer to the individual Consent Decrees. Figure 7 shows land ownership of the RASs in Eureka – most of the RASs are owned by one of two PRPs - Chief Consolidated Mining Company or Spentst Hanson et. al. Figure 7 also shows which RASs were remediated by PRPs and which were remediated by EPA and the State.

A brief summary of the major points of each PRP's settlement that relates to the RA or to operation and maintenance (O/M) of the remedy are presented below:

- North Lily Mining Company (NLMC) settled in bankruptcy and EPA received access to property for use as a borrow source to provide topsoil and fill for the remedy. One of NLMC's land parcels in Homansville has been used as a source of borrow material for the residential cleanup. No cash payment resulted from NLMC's settlement with EPA.
- Spentst Hanson (aka Keystone Surveys, Inc.; Godiva Silver Mines, Inc; Bullion Beck Mining Company) settled with EPA by providing access to a well and associated water rights for the necessary water for the project. In addition, Spentst Hanson agreed to provide up to 500,000 CY of borrow material if necessary, to perform operation and maintenance on certain remediated mine waste areas and to take possession of certain land parcels that EPA bought in order to remediate some of the mine waste areas. Under the consent decree, Mr. Hanson is required to perform the O/M on these areas unless a particular activity exceeds his financial resources. Because of his "Inability to Pay," EPA does not expect that he will be able to perform all of the necessary O/M activities in the long term. Mr. Hanson is also required to file Environmental Covenants (ECs) on specific land parcels that he owns to ensure that the remedy remains in place. A copy of the map from his consent decree showing the areas where he is responsible for the O/M is included as Figure 8.
- Chief Consolidated Mining Company (Chief) was the major mining company and PRP in Eureka. Chief operated mines in Eureka during most of the time that mining took place and has extensive land holdings in

and outside of Eureka. However, Chief does not have active mining operations and has no significant income to contribute to the cleanup. As part of its settlement, Chief has provided access to all mine waste and residential areas in and around Eureka that it owns to allow EPA to perform the RA. In addition, Chief has provided access to other land holdings for obtaining clean topsoil and rock material. EPA has operated a quarry on Lime Peak near Eureka to obtain rock materials for the project. Chief is also required as part of its settlement to sell off certain non-mining properties with a percentage of the proceeds being paid to EPA which EPA will place into the Special Account. The money paid by a PRP to settle their liability with EPA is placed into a "Special Account" for the Eureka Site so that it can be applied to response costs or to Operation and Maintenance costs at the Site.

- Atlantic Richfield Company (AR) – AR performed the remediation of the May Day, Godiva and Chief Mine No. 2 mine waste piles where it had liability. In addition, AR constructed the Knightsville sedimentation ponds (KC-1 & KC-2) and the Secondary Water System, and remediated a portion of the top of the Chief Mine No. 1 mine waste pile which is referred to as "other RA work". AR performed this "other RA work" pursuant to a Unilateral Administrative Order (UAO) that was issued prior to commencing settlement negotiations with AR. Upon reaching a substantive agreement with AR, the UAO was modified to cover AR's performance of its work during the interim until the Consent Decree was final.
- After receiving credit for this "other work", AR paid \$15,964 in cash to settle its remaining liability. This "other work" is further described in Section IV under Remedy Implementation. AR has no responsibility for performing O/M at the Site.
- UPRR (Union Pacific Railroad) – UPRR performed the remediation of Upper Eureka Gulch (within OU 00) and operated the Lime Peak quarry to produce the rock materials for EPA for the project. In addition, UPRR filed ECs on the channel referred to as Upper Eureka Gulch and paid \$270,690 in cash to settle its remaining liability. Following the completion of its work and the filing of the ECs, UPRR transferred ownership of all of its land holdings in Eureka to Eureka City. UPRR has no responsibility for performing O/M at the Site.

All other areas of the Site are being remediated by EPA as a fund-lead cleanup with the State of Utah providing 10% matching funds.

IV. REMEDIAL ACTION:

IV.A. REMEDY SELECTION

OPERABLE UNIT OU 00 – 03:

The Remedial Action Objectives (RAOs) were developed as a result of the data collected during the Removal Preliminary Assessment and the Remedial Investigation to aid in the development and screening of remedial alternatives for consideration in the Feasibility Study. The RAOs for the Site are as follows:

- Prevent exposure of children to lead in surface soil within current and future developmental properties and adjacent mine waste areas at the Eureka Mills Superfund Site where soil is determined to be the source of lead and the ingestion of soil is predicted to result in a greater than 5% chance that an individual child or a group of similarly exposed children will have a blood lead level greater than 10 µg/dL.
- Prevent exposure of adolescents and adults engaging in recreational activities to lead in surface soil within non-residential properties at the Eureka Mills Superfund Site where ingestion of soil is predicted to result in a greater than 5% chance that an individual or a group of similarly exposed individuals will have blood lead level greater than 11.1 µg/dL.

The Contaminants of Potential Concern (COPC)'s Preliminary Remediation Goals (PRGs) for residential and recreational exposure were developed based on the remedial action objectives and the results of the BHHRA. The PRGs are listed in the table below:

Table 3 – Preliminary Remediation Goals for Contaminants of Potential Concern (COPC)

CHEMICAL	RESIDENTIAL PRG	RECREATIONAL PRG
Lead (mg/kg)	231	735
Antimony (mg/kg)	110	86
Arsenic (mg/kg)	77.4	118
Mercury (mg/kg)	82	65
Thallium (mg/kg)	22	17

Because the COPC listed above have been found to be co-located, lead concentrations are used as the driver for determining when an area should be remediated.

Based on the elevated blood lead levels in residents of Eureka and the results of the BHHRA, EPA and the UDEQ determined that implementation of remedial actions at the Site are necessary to reduce local residents' exposure to lead in the environment. To document its rationale for and the selection of the remedial action, EPA issued two RODs for the Site on September 30, 2002 that addressed Human Health. The Early Interim Action ROD for OU-00 identifies actions to be

implemented to protect public health in the short term, while a long-term cleanup solution for OUs 00-03 to address lead-contaminated soils is being simultaneously implemented in the Lead-Contaminated Soils ROD.

Remediation of both the mine waste and residential areas is basically containment (capping) to prevent direct contact with contaminated materials. Sampling and analysis during the RI found that the materials are not readily leachable. The action levels as selected in the ROD were based on the risks defined by the BHHRA. The areas to be remediated on-site are based on sampling results that shows lead levels in the surface soils greater than the following:

- Residential areas: 231 ppm (parts per million)
- Recreational areas: 735 ppm (parts per million)

The Lead-Contaminated Soils ROD defined the remedy for the mine waste areas and non-residential areas to include:

- Prior to mine waste pile re-grading and capping, implementation of temporary measures to control dust from mine waste piles.
- Re-grading of existing waste piles. Includes option to excavate and relocate all or part of the mine waste piles at a Chief Mine #1 or a secondary location within Eureka.
- Cover mine waste piles with a rock or vegetative cover designed to prevent dust blowing of contaminated dust or contamination of surface water runoff.
- Address lead contamination in non-residential areas located primarily in the southeast quadrant of the Site. In the ROD, lead contaminated soils in the non-residential areas would be addressed in one of two ways: 1) excavate and dispose of lead contaminated soils up to a depth of 18 inches or 2) leave lead contaminated soils in place with appropriate institutional controls (i.e., local ordinance) until the cleanup can be undertaken by individual property owners at the time of development. For the immediate future, the non-residential areas shall be addressed through implementation of appropriate institutional controls and where appropriate, fencing.
- Implement institutional controls, in cooperation with the State and local government, at all mine waste areas and non-residential areas.

The Lead-Contaminated Soils ROD defined the remedy for the residential and commercial areas to include:

- Cleanup lead-contaminated soils in yards where contamination was found in the top 18 inches.

- A marker barrier to delineate the clean soil will be placed prior to backfilling with 18-inches of protective cover material
- Re-vegetate yards to prevent erosion.
- Disposal of contaminated soils excavated from yards.
- Construct an open cell for acceptance of contaminated soils generated from future development.
- Implement Public Health Actions including blood lead testing and health education.
- Implement institutional controls (e.g.; zoning and/or building ordinances) to control the handling and disposal of contaminated soils that may be excavated during future construction activities.

Further detail on the elements of the selected remedy for the mine waste and the residential areas can be found in the ROD.

OPERABLE UNIT 04 (OU-04)

Operable Unit 04 was not addressed in the ROD signed in 2002. OU-04 includes the groundwater pathway, the surface water pathway and ecological risk. Currently, EPA is conducting an ecological risk assessment which is expected to be completed later this year. The groundwater/surface water remedial investigation was begun in 2007.

Surface water resources are very limited due to the arid conditions with only one very small pond fed by a spring on the Site. The pond fed by this spring is approximately 24 feet in diameter. Eureka Gulch which flows through the City of Eureka is an ephemeral drainage with water present only during precipitation events or spring runoff.

In 2007, EPA conducted a limited groundwater sampling program in Eureka of existing wells. There is limited information on the construction of these wells so the sampling results were inclusive as to presence of groundwater contamination. A couple of wells had 1 or 2 parameters with concentrations above the MCLs. One well had elevated levels of arsenic and lead while the second well had an elevated level of manganese. EPA is planning on drilling 4 monitoring wells and conducting additional groundwater sampling in 2008 to determine if groundwater contamination is a widespread problem.

The City of Eureka's drinking water comes from several wells approximately 1.5 miles east of the City in an area known as Homansville and another well located approximately 4 miles to the west of the City limits in the west Tintic valley. The City also has a well located at the High School but the well is not used for potable water but for irrigation of the ball fields at the high school and at City Park. The City's wells are completed in different geologic formations than the wells sampled within Eureka. The City regularly samples their wells as part of the State's

requirements for municipal waster supplies. Sampling results show consistently high quality of water with no metals exceeding MCLs.

Based on the findings of the ecological risk assessment and the groundwater investigation, a feasibility study and proposed plan will be prepared for public review and comment in 2009.

IV.B. REMEDIAL DESIGN

The remedial design (RD) was started in the fall of 2002 after the ROD was signed and was completed in May 2003. It was performed for EPA by the U.S. Army Corps of Engineers (USACE) and their design contractor, HDR Engineering in Omaha, Nebraska. During the course of the RD, the Federal Emergency Management Agency (FEMA) with EPA's cooperation performed a Flood Insurance Study (FIS) in 2002 to update the designation of the 100-year flood plain in Eureka. FEMA published the Draft FIS in 2002 which became the basis for the hydrologic design of the drainage channels and sediment ponds in EPA's remedial design. In 2007, FEMA finalized the FIS and published the 100-year flood map. The Remedial Design including all design drawings, specifications, quality assurance and quality control requirements, and health and safety requirements are found in the Remedial Action Work Plan (RAWP), most recently revised in April 2008.

IV.C. REMEDY IMPLEMENTATION (CURRENT STATUS)

Implementation of the remedy is still underway; however, construction of the remedy has been completed on some portions of the Site. The Remedial Action began in the summer of 2003 on several mine waste areas. In the summer of 2004, remediation of residential areas commenced. Each year since 2004, the remedial action has included work on both mine waste and residential areas.

Overall, the implementation of the remedial action has not encountered significant problems that have affected the schedule or cost of the project. The project has proceeded fairly closely to what was originally planned in the remedial design however the project is now experiencing increased costs due to inflation and due to rising fuel costs. There have been some minor changes and adjustments during construction to take advantage of opportunities that would save considerable cost during the RA or would minimize operation and maintenance of the remedy.

While there are many instances of cost-saving efforts, the most significant one is that of operating a quarry for all of the rock material (riprap, armoring, roadbase, etc.) for the project. The Site's remote location from major supply sources and subcontractors has been a challenge during the course of the cleanup. Initially, for the remediation of the Gemini-Bullion Beck mine waste area, all the rock material was hauled from a quarry approximately 35 miles away.

In 2004, an agreement was reached with Chief (a PRP) to open the Lime Peak quarry which was located approximately 1.5 miles from the Site. EPA and at times, two different PRPs, have operated the quarry for the production of the rock materials. The cost savings in terms of transportation and in terms of having tighter control on the quality of the rock materials and timing of delivery are significant, especially with the increasing fuel costs over the last years.

IV.C.1. Operable Unit 00 (OU-00)

This operable unit is considered the site-wide OU and includes the residential areas in Eureka. There are approximately 709 residential properties in Eureka with lead levels in the soil greater than 231 ppm. Figure 9 shows the progression of cleanup in the residential areas through the 2008 construction season.

In non-residential areas (defined as "Open Lands" without RASs), property will be cleaned up by the property owner at the time of development. These areas are generally covered with thick vegetation (sagebrush, etc.) that minimize the potential for exposure from either direct contact or wind-blown dust. Figure 10 shows the areas currently defined as "Open Lands."

All residential remediation is being conducted as a fund-lead cleanup by EPA with the State providing a 10% match of funds. Depending on funding, increased costs and any other unforeseen circumstances, EPA expects to complete the cleanup of the residential areas in 2010.

Upper Eureka Gulch:

Upper Eureka Gulch (UEG) is part of OU-00 although it was remediated by Union Pacific Railroad (UPRR), in 2005-2006. The work was performed by UPRR as a PRP-lead cleanup under a consent decree with EPA. Although it is labeled as an RAS, the only portion of UEG that has an EC is the constructed channel of UEG. The remaining land area was graded and capped in accordance with the requirements for residential remediation. Upon completion of the RA work, UPRR transferred ownership of UEG to the City. This area will be divided into smaller parcels by the City and transferred to residents of Eureka for residential uses. Development activities on these areas will be governed by the draft ordinance currently under consideration by the City Council.

Institutional Controls:

Pursuant to the ROD, the remedy requires institutional controls over the entire Site since contaminated materials will be left on-site. For the RASs (mine waste areas), ECs are required in addition to a local excavation ordinance. As discussed above, ECs have been filed on most of the land parcels where the RASs are located although there are a few parcels that still require ECs.

Environmental Covenants are restrictive easements that are filed at the Juab County Recorder's office in the chain of title on the land parcels that comprise the

RASs. The ECs limit the types of activities and land uses that can take place on the particular land parcel to ensure that the cap on an RAS is undisturbed and that remedy remains protective over the long term. There is a provision for modification of the EC but only with the approval of EPA and the State.

Environmental Covenants (EC) have been filed on most of the land parcels where RASs have been or will be constructed. Table 4 is provided at the end of the report in the Tables section. The table lists all of the land parcels for each RAS and whether an EC has yet been filed. If filed, the date of the filing is shown. Figure 11 shows the areas of the RASs that have ECs already filed.

For the residential areas and the Open Lands, EPA and the State have been working with the City of Eureka on the development of a local ordinance that will govern excavation activities once RA has been completed. The ordinance will require property owners to obtain a permit from the City for all "Restricted Activities" as defined in the draft ordinance. The draft ordinance is currently under consideration by the Eureka City Council with adoption hearings expected in 2009.

Public Health Actions:

The ROD also required of public health actions consisting of the following:

- Regular blood lead testing
- Educational Outreach Programs
- Voluntary Residential Program for Soil and In-home Dust Sampling and Cleanup

The Utah Department of Health (UDOH) along with the regional public health department has performed quarterly blood lead testing in Eureka since the fall of 2000. In addition, UDOH has conducted health education primarily in the schools and provided appropriate public health counseling to parents with a child with an elevated blood lead level. Over the past 8 years, the frequency of elevated blood lead levels has steadily declined such that in a recent review by EPA, UDEQ and UDOH, it was determined that the frequency of the blood lead testing program could be reduced to annual testing. The only exception to annual testing would be for children who have blood lead levels above 10 µg/dL. In those instances, UDOH would continue to follow-up with quarterly blood lead testing until that child's blood level was less than 10 µg/dL. The results of the blood lead testing program over the past 8 years are summarized in Appendix A

IV.C.2. Operable Unit 1 (OU-01)

OU-01 includes May Day and Godiva Mine Waste Piles and the Godiva Shaft Areas which consists of mine waste piles on the east side of Eureka.

May Day and Godiva:

In 2003 Atlantic Richfield (AR) began remediation of the following mine waste areas – May Day, Godiva Shaft and Tunnel. They completed the remediation of these areas in September 2004. Mr. Spent Hansen currently owns the all properties associated with these RASs. Environmental covenants have not been filed on these properties.

Other RA Work Performed by AR:

Chief Mine #1 and Knightsville Sedimentation Ponds were completed by AR and are discussed in OU-03. A secondary water supply system to supplement the City of Eureka public water supply system was determined during the remedial design to be essential to implementing the remedy since at that time the City did not have sufficient water to meet its own critical needs and its infrastructure was inadequate to meet the full needs of the project. AR constructed what is referred to as the Secondary Water System. The construction consisted of re-drilling a new water supply well, constructing a million gallon temporary storage pond on the top of the Chief Mine No. 1 waste pile and constructing a 3 ½ mile temporary water line from the well to the storage pond. The Secondary Water System will be removed and disassembled upon completion of the RA, with the exception of the well which will be turned back to the property owner whose land it's located on.

AR also installed utilities on the top of the Chief Mine No. 1 waste pile and capped the top of the mine waste pile as part of developing a suitable Site Management area for office trailers and equipment and material storage. EPA will complete the capping and closure of the Chief Mine No. 1 mine waste pile as part of the fund-lead RA.

Pre-final and final inspections were conducted by EPA with UDEQ in September 2004 on the remediation completed by AR. AR submitted a final RA report including final "As-built" drawings in the summer of 2005. EPA released AR from further response actions at the Site in September 2005.

IV.C.3. Operable Unit 2 (OU-02)

Gemini Mine Waste Pile, Bullion Beck Mine Waste Pile and Mill Site and Lower Eureka Gulch:

This operable unit consists of mine waste piles on the west side of Eureka. The Gemini and Bullion Beck mine waste areas and Lower Eureka Gulch were remediated as one unit by the U.S. Environmental Protection Agency as part of the fund-lead RA. The RA commenced in September, 2003 and was completed in September 2004. The remediation consisted of several components – relocating the entrance to City of Eureka's city maintenance yard where it crosses Lower Eureka Gulch, constructing a new channel in Lower Eureka Gulch to accommodate the 100 year flood, re-locating sections of the city's sewer and water lines within Lower Eureka Gulch drainage, constructing a 2-tier retaining wall at the toe of the Gemini mine waste pile, grading and capping of the Bullion

Beck mine waste pile (including the City's maintenance yard), Bullion Beck Mill Site and the Gemini Mine waste pile. Replacement of fencing and paving of the ATV path which also serves as an access road along side the City's water main in Lower Eureka Gulch were also part of the remedial action.

EPA conducted a pre-final and final inspection with UDEQ in the fall of 2004 and prepared a final RA report which was approved by both EPA and UDEQ in September, 2005.

As part of the Remedial Action, EPA acquired 7 land parcels along the eastern edge of the Gemini mine waste pile. The acquisition of these parcels was necessary for the remediation of the mine waste pile. Upon completion of the remediation at the Gemini Mine, EPA is required to file the ECs on the parcels and then transfer ownership according to the Consent Decree with Spent Hansen, a PRP. Environmental Covenants (ECs) are required for the Gemini-Bullion Beck mine waste areas. To date, Chief and Spent Hansen have filed ECs for the parcels they own. ECs still need to be filed by EPA and the City for their parcels at the Gemini-Bullion Beck mine waste area.

IV.C.4. Operable Unit 3 (OU-03)

This Operable Unit consists of several mine waste areas on the south central and western side of Eureka where the remediation has either been completed or is in progress. Depending on funding, EPA anticipates completing the RA for OU-03 in 2010.

OU 3 includes and Chief Mine No. 1, Chief Mill Site No 1, Chief No 1 Mill Tailings/Chief Mill No. 1, Open Cell, Eureka Hill, Snowflake, Eagle Blue Bell (EBB) Mine, EBB Transition and EBB Dump. Chief Mine No. 2 and Knightsville sediment ponds both completed by Atlantic Richfield are also included in OU-03. In accordance with the approved RAWP, the mine waste areas are graded to stable slopes and capped with armor rock or roadbase material (depending on slope). All of the remediation work of these mines waste areas is being conducted by EPA as fund-lead work with the State providing a 10% match. Chief has filed environmental covenants on all land parcels in OU-03 that have RASs and are owned by Chief.

Chief Mine No. 2

Chief Mine No. 2 started by Atlantic Richfield 2003, completed in September 2004. Mr. Spent Hansen currently owns half the property associated with this RAS the rest being owned by Chief. Environmental covenants have not been filed on these properties.

Knightsville Sedimentation Ponds:

AR constructed the Knightsville sedimentation ponds (including the construction of the underground storm drain to convey the discharge from the sediment ponds to Upper Eureka Gulch) at the same time as they conducted the work on the May Day & Godiva mine waste piles. AR also relocated the lower portion of Knightsville road from the western side of the Blue Rock property to the eastern edge of the property to allow the installation of the culvert between the sediment pond and Upper Eureka Gulch. The road was located on the Blue Rock property where the alignment of the culvert was planned. AR capped Knightsville road between US Highway 6 and the intersection with the May Day Access Road. Environmental Covenants (ECs) have been filed by Chief on the land parcels they own in OU-03. ECs on the land parcels owned by Mr. Spent Hansen in OU-03 have not yet been filed.

Eureka Hill & Snowflake mine waste piles & Eagle Blue Bell mine, transition and dump:

EPA completed the implementation of the RA on the Eureka Hill, Snowflake and Eagle Blue Bell mine, transition and dump in 2006. All of these mine waste piles were capped with armor rock and roadbase. The pre-final and final inspections of these areas were conducted on November 13, 2006 and May 7, 2007. The final RA Report for 2006 on these areas was approved in May, 2008.

Chief Mine No. 1:

The contaminated soils removed from the residential areas (Operable Unit 00) are being disposed of in two areas of OU-03: Chief Mine #1 and the Open Cell. A repository was developed at the western edge of the Chief Mine No. 1 mine waste pile during the Removal Action (2001 & 2002). Residential soils removed during the RA in 2004 and 2005 were also placed in the repository at the Chief Mine No. 1. The repository will remain open until EPA completes the residential cleanup. Aside from the repository on the western edge of the Chief Mine No. 1 mine waste pile, EPA expects to complete capping of the north face of the Chief Mine No. 1 in 2009. The top of the Chief Mine No. 1 was capped by AR in 2003 and is currently used for EPA's site management offices and construction yard for the RA.

Open Cell:

In 2006, EPA began construction of the Open Cell using the residential soils to construct the berms of the outer sides of the Open Cell and continued to use the contaminated residential soils to construct the berms of the Open Cell in 2007. EPA expects to complete the construction of the Open Cell in either 2008 or 2009. The Open Cell as a component of the institutional controls will be used for the proper disposal of contaminated soils that are excavated during development activities in the City that occur following the completion of the RA. Disposal of these contaminated soils will be pursuant to the provisions of the excavation ordinance to be adopted by the City of Eureka.

Chief Mill Site No. 1 & Chief No. 1 Mill Tailings:

EPA began remediation of the Chief Mill Site No. 1 during the winter of 2007-08 with the demolition of the mill foundation. EPA will continue the remediation of the site and final capping. A design change was made on part of the cap and agreed to with the State of Utah in 2007. The change will allow a vegetative cap for the relatively flat slopes that will be achieved as final grade saving the cost to make more armor rock and allowing the site to blend visually with the surrounding areas at the base of the mountain. The ROD as well as the RAWP allowed for either a rock or vegetative cover for mine waste areas since either type of cover can be protective. The side slopes on the northern edge of the mill site will be capped with armor rock. EPA has not yet begun work on the Chief No. 1 Mill Tailing site.

IV.D. OPERATION AND MAINTENANCE (O/M) (CURRENT STATUS)

The State Superfund Contract (SSC) with the State of Utah requires the State to perform Operation and Maintenance for the fund-lead areas at the Eureka Mills Superfund Site. In addition, EPA's consent decree with Spentst Hanson, et.al. requires him to perform operation and maintenance activities at specified RASs to the extent of his financial capability.

Originally, the O/M manual was titled the O/M Plan included both the technical direction and responsibilities. As a result of recent discussions with the State, EPA has removed the discussion on responsibilities and re-named the document: The Operations and Maintenance Manual. This manual provides technical direction for the conduct of the operation and maintenance activities at the Site. The original O/M manual (originally O/M Plan) was completed in the Spring of 2006 and most recently revised in October 2007 but due to issues that need to be resolved, it has not yet been approved by the State and thus finalized by EPA. Consequently, there have been no operation and maintenance activities performed to date by the designated PRP, the State or other parties responsible for O/M.

According to section 300.435 (f) of the NCP,

“Operation and maintenance measures should be initiated after the remedy has achieved the remedial action objectives and remediation goals ... and is determined to be operational and functional... A remedy becomes operational and functional either one year after construction is complete or when the remedy is determined by EPA and the State to be functioning properly and is performing as designed, which ever is earlier.”

One of the disagreements between EPA and the State was determining when operation and maintenance activities should commence. The State's position is that it should not commence on the portions that the State will be responsible for until all of the remedial action work has been completed on the entire site (i.e., construction completion). EPA has contended that O/M activities at Eureka

should be phased in as the construction of individual RAS' or of separate operable units is complete. At this time, the issue of when the State will commence its O/M responsibilities at the Site is still under discussion and yet to be decided. However, for the Spent Hanson properties, O/M responsibilities will commence once the O/M Manual is finalized in the Fall of 2008.

In addition, a separate O/M Plan will be developed which will include responsibilities and costs listed each portion of the Site. This will also have to be approved by both EPA and the State and incorporated into a revised SSC by reference.

V. PROGRESS SINCE THE LAST FIVE YEAR REVIEW

This is the first five year review conducted at the Site.

VI. FIVE YEAR REVIEW PROCESS

VI.A. ADMINISTRATIVE COMPONENTS

The Eureka Mills Superfund Site Five-Year Review Team is lead by Paula Schmittiel, Remedial Project Manager (RPM) for the Eureka Mills Superfund Site and includes the following members:

- Mary Darling, USACE Project Manager for the Remedial Action
- Joe Shields, HDR Engineering Design Engineer
- Libby Faulk, EPA Community Involvement Coordinator
- Michael Storck, Utah State Project Manager
- Patricia Smith, EPA Region 8 Five Year Review Coordinator

The schedule for the Five Year Review includes a detailed Site Inspection, drafting of the Five Year Review report in June and reviews by EPA-HQ and the State in July. EPA Region 8 is preparing the Five-Year Review report with the assistance of USACE and their contractor, HDR Engineering, Inc. The Region expects to finalize the report by September, 2008. The State was notified on April 25, 2008 via e-mail of EPA initiating the five year review and inviting the State to participate in the Site Inspection the week of May 5th. No PRPs have been notified of five year review since they are not required under their consent decrees to perform or participate in the five year reviews.

VI.B. COMMUNITY INVOLVEMENT

A meeting with the EPA community involvement coordinator for the Site and with the Region 8 five-year review coordinator took place on April 23, 2008 to discuss community involvement in the five-year review. Because the cleanup is still underway with an active EPA presence on-site and because the project had just updated the Community Relations Plan including community interviews in 2007, it was decided that community interviews were not necessary for this five-year review.

Members of the community were notified of the commencement of the five year review on May 16, 2008 through a notice placed in the "Nebo Reporter." On May 12, 2008 EPA informed the City officials of the commencement of the five year review. When the five-year review report is finalized in September, 2008, a notice will be placed in the local newspaper and a copy of the report will be available to the public in the on-site repository at City Hall.

VI.C. DOCUMENT REVIEW

The five-year review included review of relevant documents. The relevant documents referred to during the five year review are listed in Appendix B of this report. Because the remedial action is still underway and because O/M activities have not yet been initiated on the completed areas of the Site, there are not any O/M records or monitoring data.

Separate RA reports were prepared upon completion of the RA for OU-01 and for OU-02 and for Upper Eureka Gulch. For all fund-lead RAs conducted after the completion of OU-02, EPA decided it would be more appropriate to prepare an annual RA report for the work conducted that year. Each year's RA report summarizes the residential remediation conducted during that year and the construction of any RASs which were completed during that construction season. Each RA report includes all documentation for the remediation completed during that construction season including "As-built" drawings, QC documentation, photos, pre-final and final inspections, etc.

Because the O/M manual has not been finalized, operation and maintenance activities have not been initiated at the Site, no data or O/M reports are available. Since the completion of the remedial action for two of the Operable Units at the Site, no monitoring data, progress reports or performance evaluation reports have been prepared. Because the remedy is a containment remedy no "treatment" components were constructed.

Informal inspections have been conducted of re-vegetated areas (residential or mine waste) to assess the success of the re-vegetation. Re-vegetation is proving successful although the process takes 2+ years to establish. In the residential areas, re-vegetation consists of several methods – replacement of sod where sod was present before the cleanup, turf seeding and native vegetation seeding. In non-residential areas including mine waste areas, areas are seeded with native vegetation. A complete photo library of the re-vegetation progress is

available at the EPA Eureka field office. A few samples of the re-vegetation progress are included with site photos in the Appendix C.

VI.D. SITE INSPECTION

The Site Inspection was conducted by Paula Schmittiel, EPA; Mary Darling, USACE; Joe Shields, HDR; and Michael Storck, UDEQ on Wednesday, May 7, 2008. The temperature was 55-60° with wind and intermittent rain. The inspection took about 4 hours to perform.

The Operation and Maintenance Manual provides checklists for inspection of all RASs including drainages, sediment ponds and haul/access roads. Although the O/M manual is not yet finalized, it contains a detailed site inspection checklist for each RAS. These inspection checklists were completed by EPA as part of the Five-Year Review inspection and are included in Appendix D. Figure 4 shows the primary RASs that have been constructed and were inspected during the five year review. For the location of specific drainage and access/haul road features refer to Figures 5 and 6 when reviewing the checklists for those features.

The purpose of the Five-Year Review inspection is to assess the protectiveness of the remedy including the integrity of the capped areas, and the fencing already constructed. Most areas that were inspected did not show any issues with the capped areas with the exception of the following items. These issues are noted on the inspection sheets.

- **Chief Mine No. 2 Access Road** – rutting along the north side of the road and other minor rutting/erosion was noted but it is not impacting the remedy at this time. The rutting should be repaired in the near future to maintain the overall integrity of the cap.
- **Eagle Blue Bell Access Road, Lower Access Road and Haul Road** – During winter operations, snow removal displaced some of the roadbase cap. Minor regrading is needed.
- **Gemini Mine Waste Pile** – the lock on the gate to the Bullion Beck Mill was not working. The lock should be fixed.
- The inspection at Gemini mine waste pile revealed no problems during the site inspection, however, the O/M Manual requires that the Mechanically Stabilized Earth retaining wall on the Gemini Mine Waste Pile adjacent Highway 6, be surveyed every other year for the 1st five years to ensure that the wall is stable. Because there has not been any O/M performed at the Site, this wall has not been surveyed since the wall was constructed.
- Since the completion of the RAS, the Gemini headframe has fallen down. At the beginning of the project, an engineering evaluation of both the Gemini and Bullion Beck headframes was performed by a structural engineer/architect (Cooper, Roberts, and Simonsen) from Salt Lake City. The report indicated the Gemini was in poor structural condition, and for crew and public safety the Gemini headframe area was fenced off and not

entered. On May 22, 2007, Paula Schmittiel notified UDOGM that about 2 weeks prior, EPA had inspected the Gemini-Bullion Beck mine waste remediation and had noticed subsidence of the soil adjacent to the mine shaft, which is a serious safety issue. This caused the headframe to lean precariously. Later in 2007 high winds caused it to fall down, the main supports were rotted where they had been in contact with the concrete bases. EPA does not consider this issue to be related to the integrity of the remedy. To date, UDOGM has not undertaken any actions to address the subsidence around the shaft.

- **The City Maintenance Yard** was inspected and no issues were found.
- **Lower Eureka Gulch** was inspected (adjacent the City Yard and adjacent the City offices). Lower Eureka Gulch had sediment and trash deposited in the bottom but is not limiting flow or the remedy. There is no armor on the bottom of the gulch at this point because the bottom is bedrock.
- **Bullion Beck Head Frame** was inspected and no issues found. The Bullion Beck headframe was rehabilitated as part of the required cultural mitigation for SHPO.
- **The Eagle Blue Bell RAS** was inspected. The armor cap, roadbase cap, and waterbars are intact. The riprap in the EBB channel is intact. The roadbase on the haul road was disturbed and pushed into the top of EBB channel while clearing the haul road of snow during the winter of 2007-2008 to work on Chief Mill Site #1. The EBB headframe and loading chute were fenced for worker and public safety before construction on the RAS started. The EBB loading chute partially fell down the night of June 6th 2007 in very high winds.
- **May Day Mine Waste Pile** – It was noted that Upper Access Road at the beginning just off Knightsville road had erosion several inches deep. The access road is not critical to the remedy so a repair is not required at this time.
- The gate at the top of the access road to the May Day and Upper Godiva mine waste piles has been vandalized and no longer limits access. The gate is not considered critical to the remedy, so repair is not required.
- Three sections of fencing along the May Day access road are missing, however, the fencing is not considered critical to the remedy so repair is not recommended.
- **KC-1 Knightsville Sediment Pond (Upper)** - No issues were found.
- **KC-2, Knightsville Sediment Pond (Lower)** - Inspection showed rilling/erosion adjacent to transition between the Upper Knightsville sediment pond (KC-1) and KC-2) along Knightsville Road. The drainage along Knightsville Road cuts from the east side to west side at this point. Since Knightsville Road is a Juab County road, it is recommended that EPA have the county install a culvert to convey runoff from east side of

road to the west side of the road where it can be directed into into the lower sediment pond. Without the installation of a culvert to correct the drainage problem, erosion on the west side of the road will continue to be a problem. This erosion situation is causing erosion to the entrance road to the lower sediment pond (KC-2) and deposition of roadbase in the bottom of the sediment pond.

- **Knightsville Culvert** – This culvert conveys the runoff from KC-2 sediment pond to Upper Eureka Gulch. Five manholes into the Knightsville culvert (which exits from the Knightsville sediment ponds) were inspected (south of Highway 6). The four upper gradient manholes were free of sediment. The fifth manhole, by Highway 6, had approximately 18-inches roadbase and sediment in the bottom but it was not obstructing water flow. The slope of the culvert upgradient of the manhole is quite steep and at this manhole the grade of the culvert becomes less steep before crossing Highway 6, so sediment naturally drops out of flow at this manhole. Removal of the sediment is not recommended as in the next high flow the water will most likely wash existing sediment out while depositing sediment from upgradient.
- **Upper Eureka Gulch (UEG)** – Inspection of UEG showed that tumbleweeds have collected in the grates of Knightsville culvert where it daylight and discharges into Upper Eureka Gulch. Tumbleweeds should be removed as a large water event may distribute seed further down the gulch. Tumbleweeds and other vegetation have also deposited in the gulch further down the stretch of UEG, and at the culverts under Bulk Plant Road,. Spraying the gulch for weeds may be appropriate if regulations do not prevent spraying. Tumbleweeds lodged against the west side of the snow fencing along Bulk Plant road adjacent to UEG should also be removed to prevent seed from spreading.
- **Institutional controls** (both Environmental Covenants and local ordinances) as discussed above in Section IV.B.4., are not yet fully implemented.

VI.E. COMMUNITY INTERVIEWS

Community interviews were unnecessary for the five-year review for the following reasons:

- The Community Relations Plan had been revised in 2007 and community interviews were conducted at that time.
- EPA has a significant presence on-site since remedial action is on-going and;
- EPA/USACE meets 3-4 times/month (or more) with City officials,

Overall, the community is pleased with the remedial action and does not have any major concerns. Because EPA and USACE have a continuing presence on-

site, they along with their contractors are usually aware of any issues when they arise and they are quickly resolved.

VII. TECHNICAL ASSESSMENT

VII.A. QUESTION A

IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

Yes, the review of the documents, ARARs, risk assumptions and the results of the site inspection indicate that the portions of the remedy that are completed are functioning as intended by the ROD. The stabilization and capping of the contaminated soils and mine waste areas and the construction of specific drainage features is achieving the remedial action objectives by preventing exposure of lead contaminated soils and mine waste through direct contact or inhalation of air-borne dust. While the implementation of the remedy is not yet complete, the decrease in elevated blood lead levels as shown by the recent trends in the blood lead testing program can be attributed at least in part to the capping of several of the large mine waste areas and the residential cleanup.

Because this is a containment remedy, which is designed to be low maintenance, the lack of maintenance has not significantly impaired the effectiveness of the remedy. Only a few very minor issues related to the capping of mine waste areas were noted during the site inspection. If the most notable of these issues – the erosion present at KC-2 sediment pond – is corrected soon, the overall effectiveness of the remedy should function as intended in the long term.

The extent of fencing to control access to most non-residential areas of the Site (i.e., mine waste areas and open lands) may need to be reconsidered since several of the areas that have already been fenced and gated as part of the RA have been vandalized. Given that these areas are located in remote areas of Juab County (outside of the Eureka corporate limits) and that the property owners may not be local, successfully maintaining the fencing may not be cost effective. More limited fencing to specific areas that pose a particular safety issue – open shafts or protection of a particular historic feature such as a head frame - may be more reasonable.

There were no opportunities for system optimization observed during this review. With the implementation of the institutional controls (both the ordinance and the ECs) being completed in the near future, and resolution of the issue regarding O/M responsibilities, the remedy should remain fully protective of human health.

VII.B. QUESTION B

ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS AND REMEDIAL ACTION OBJECTIVES (RAOs) USED AT THE TIME OF THE REMEDY SELECTION STILL VALID?

Yes, there have been no changes to the physical conditions of the Site that would affect the protectiveness of the remedy as it was intended in the ROD and as it was designed in the RD. As the remedial action is still underway, human exposures are not yet fully under control, although EPA expects human exposure to be fully controlled by the completion of the RA.

The current soil cleanup levels selected in the ROD were based on the estimated risks defined in BHHRA. The assumptions for exposure, toxicity and risk assessment methods have not changed since the risk assessment in 2002. No new contaminants of concern or contaminant sources have been identified since the ROD and the commencement of the RA. Because the Ecological Risk Assessment is not yet complete, the need for protection of ecological receptors is unknown at this time.

The current land use and reasonably expected future land use have not changed. If the current land use in some undeveloped areas within the corporate limits of Eureka were to change, the institutional controls (both the ordinance and ECs) would ensure that future development occurs in a manner that protects human health against exposure to contaminants of concern.

VII.C. QUESTION C

HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

No, there is no other information that calls into question the protectiveness of the remedy for human exposure at this time.

VII.D. TECHNICAL ASSESSMENT SUMMARY:

Implementation of the RA is not yet complete but review of those portions of the Site that have been remediated indicate that the remedy for the most part is functioning as intended by the ROD. With full implementation of all institutional controls for the Site, all remediated portions of the Site can be fully protected. Until then, EPA's presence on the Site limits the potential for disruption of the in-place remedy.

There have been no changes to the physical conditions of the Site that would affect the protectiveness of the remedy as it was intended in the ROD and as it was designed in the RD. The RAOs in the ROD are being met for those portions of the Site that have been remediated. The current soil cleanup levels and toxicity factors for the contaminants of concern have not changed since the BHHRA and there have been no changes to the standardized risk assessment

methodology that could affect the protectiveness of the remedy for human exposure. There is no other information that calls into question the protectiveness of the remedy.

VIII. SITE ISSUES

The following issues were identified during the Site Inspection.

Table 5– Summary of Site Issues

	Issues	OU	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1	O/M manual is not in place so O/M is not occurring	All	Y	Y
2.	Resolution of O/M Responsibilities w/the State	All	Y	Y
3	Minor displacement of roadbase on several sections of Eagle Blue Bell access/haul roads	03	N	Y (But not likely to be much of a problem since area is flat)
4	Minor rutting/erosion of roadbase on access road to Chief Mine #2	03	N	Y
5	Gemini mine waste pile – lock on gate to Bullion Beck mill not working	02	N	N
6	Surveying of points on welded wire retaining wall on Gemini mine waste pile	02	N	Y (Unknown if wall is shifting w/out confirming thru surveying - Required by O/M manual)
7	Upper Access Road to May Day mine waste pile is eroding at turn-off from Knightsville road	01	N	Y (Road was constructed to access May Day waste pile – if maintenance of pile cap requires access w/equipment)
8	Gate and fencing on May Day access road has been vandalized	01	N	Y (Not critical unless vandalism to cap occurs)
9	Erosion/rilling of roadbase on access road to Lower Knightsville Sedimentation Pond, KC-2	03	N	Y
10	Implementation of institutional control – local ordinance & rest of ECs should be filed at county	All	N	Y
11	Noxious weeds should be removed from UEG	00	N	Y

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 6 – Recommendations and Follow-Up Actions

	Recommendations & Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date
1	EPA & State finalize O/M manual so O/M can commence	EPA	EPA	10/31/2008
2.	Resolve O/M Issues w/State & revise SSC	EPA & State	EPA	October 2008
3	Re-grade sections of Eagle Blue Bell access/haul road **	EPA	EPA	12/31/2008
4	Re-grade & compact roadbase on access road; divert runoff away from road where it is eroding	Spentst Hanson	EPA	June 2009
5	Repair or replace lock	Spentst Hanson	EPA	June 2009
6	Survey retaining wall	Spentst Hanson	EPA	June 2009
7	Repair rutting on May Day access road with armor rock in "Texas-style" crossing	Spentst Hanson	EPA	June 2009
8	Repair/replace or re-consider fencing along May Day access road	Spentst Hanson	EPA	June 2009
9	Work with Juab County to address drainage issue along Knightsville road.	EPA	EPA	June 2009
	Repair erosion of roadbase on access road to KC-2 sediment pond –	TBD	EPA	TBD
10	Adopt ordinance & set up administration of ordinance ***	City of Eureka	EPA	08/31/2009 (or sooner)
	File remaining ECs on RASs at County Recorder's Office^^	EPA & Spentst Hanson	EPA	03/31/2009
11	Remove weeds	City of Eureka	EPA	04/30/2009

** EPA is using sections of access/haul road for project work and will maintain while RA work is in progress.

*** Depends on resolution of funding of ICs and other O/M issues with State.

^^ Depends on resolution of language with State for ECs yet to be filed.

X. PROTECTIVENESS STATEMENT

As discussed in the main body of the Five Year Review report, the RI/FS for Operable Unit (OU) 04 is still underway so a final determination of ecological risk and groundwater contamination has not been made. The ecological risk assessment and RI/FS for groundwater will be completed in 2009. The ROD for OUs 00-03 only addresses human health exposure.

X.A. OU-00 SITE WIDE INCLUDING RESIDENTIAL:

The remedy (residential soil removal) at OU-00 is still under construction with approximately 70% complete. The remedy is expected to be protective of human health once the RA is completed and the institutional controls (local ordinance) are implemented. In the interim, exposure pathways that could result in unacceptable risks remain uncontrolled. However, regular blood lead testing and public health education are being implemented to mitigate those risks.

X.B. OU-01 MAY DAY – GODIVA SHAFT AND TUNNEL:

The remedy at OU-01 is currently protective of human health because the large mine waste piles in OU-01 have been capped. However, for the remedy to remain protective in the future, the following actions should be completed:

- The minor erosion issues noted above should be addressed
- Environmental Covenants (ECs) for OU-01 that have not yet been recorded at Juab County should be filed to ensure the remedy remains protective.

X.C. OU-02 BULLION BECK – GEMINI MINE WASTE PILES:

The remedy at OU-02 is currently protective of human health because the mine waste areas have been capped. However, for the remedy to remain protective in the long-term, operation and maintenance activities should be implemented including the surveying of the retaining wall to ensure it has not shifted and the filing of the unrecorded ECs for OU-02 with the Juab County Recorder's office.

X.D. OU-03 CENTRAL EUREKA MINING AREAS:

The remedy at OU-03 is expected to be protective of human health once the RA is completed and the Environmental Covenants have been filed. Until construction is complete for the entire OU, the exposures pathways at some RASs in OU-03 that could result in unacceptable risks remain uncontrolled. However, regular blood lead testing and public health education are being

implemented in the community even though no one lives directly on this Operable Unit.

XI. NEXT REVIEW

The next five-year review will be conducted for the entire Site in 2013. At that time, it is expected that all remedial response actions should be completed with a Construction Completion and all O/M responsibilities in place. The five-year review report for that review should be completed by September 2013.

TABLES

TABLE 4 – REMEDIAL ACTION STRUCTURE PROPERTIES REQUIRING ENVIRONMENTAL COVENANTS

#	Owner	Card # or Parcel ID	Environmental Covenant Recorded? (Yes/No)	Date Covenant Recorded
Gemini/Bullion Beck				
1	Keystone/Mammoth	C # 556	Yes	11/2/2005
2	Keystone/Mammoth	C # 347	Yes	11/2/2005
3	Keystone/Mammoth	C # 314	Yes	11/2/2005
4	Keystone/Mammoth	C # 389	Yes	11/2/2005
5	Keystone/Mammoth	C # 532	Yes	11/2/2005
6	Keystone/Mammoth	C # 272	Yes	11/2/2005
7	Keystone/Mammoth	C # 345	Yes	11/2/2005
8	Keystone/Mammoth	C # 267	Yes	11/2/2005
9	Keystone/Mammoth	C # 212	Yes	11/2/2005
10	Keystone/Mammoth	C# 374	Yes	11/2/2005
11	Keystone/Mammoth	C# 320	Yes	11/2/2005
12	Keystone/Mammoth	C# 690	Yes	11/2/2005
13	Keystone/Mammoth	C#239	Yes	11/2/2005
14	Keystone/Mammoth	C#240	Yes	11/2/2005
15	Keystone/Mammoth	C# 238	No	
16	Keystone/Mammoth	C # 523 & 523A	No	
17	Keystone/Mammoth	C # 175	No	
18	Okelberry	C # 264	No	
19	Okelberry	C # 1A	No	
20	Chief Consolidated	XE 5530	Yes	110/06/2006
21	Chief Consolidated	C # 564	Yes	110/06/2006
22	Chief Consolidated	C #153	Yes	110/06/2006
23	Chief Consolidated	C #1A	Yes	110/06/2006
24	Chief Consolidated	C #565	Yes	110/06/2006
25	Chief Consolidated	C #112	Yes	110/06/2006
26	Chief Consolidated	C#158	Yes	110/06/2006
27	Chief Consolidated	C#553	Yes	110/06/2006
28	Chief Consolidated	C #264	Yes	110/06/2006
29	Chief Consolidated	C #660	Yes	110/06/2006
30	Chief Consolidated	C #1A	Yes	110/06/2006
31	Chief Consolidated	C #564	Yes	110/06/2006
32	Chief Consolidated	C#523	Yes	110/06/2006
33	Chief Consolidated	C#672 & 672A	Yes	110/06/2006
34	Chief Consolidated	C#238	Yes	110/06/2006
35	Chief Consolidated	C #211	Yes	110/06/2006
36	Chief Consolidated	XE 5529	Yes	110/06/2006
37	Chief Consolidated	XE 5643-A	Yes	110/06/2006
38	Chief Consolidated	XE 5643-B	Yes	110/06/2006

TABLE 4 – REMEDIAL ACTION STRUCTURE PROPERTIES REQUIRING ENVIRONMENTAL COVENANTS

#	Owner	Card # or Parcel ID	Environmental Covenant Recorded? (Yes/No)	Date Covenant Recorded
39	Chief Consolidated	XE 5534	Yes	110/06/2006
40	City of Eureka	City Yard	No	
41	City of Eureka	RR Parcel 7	Yes	Dec-05
42	EPA	370 W Evans	No	
43	EPA	380 W Evans	No	
44	EPA	385 W Evans	No	
45	EPA	037 N Last Chance	No	
46	EPA	067 N Last Chance	No	
47	EPA	075 N Last Chance	No	
48	EPA	099 N Last Chance	No	
Open Cell				
1	Chief/Hoyt/Juab County	C # 11	Yes	10/6/2006
2	Chief Consolidated	C # 456	Yes	10/6/2006
3	Chief Consolidated	C # 567	Yes	10/6/2006
4	Chief Consolidated	C # 207	Yes	10/6/2006
Eureka Hill				
1	Keystone/Mammoth	C # 388	No	
2	Okelberry	C# 407	No	
3	Chief/Hoyt/Juab County	C # 11	Yes	10/6/2006
4	Chief Consolidated	C # 388	Yes	10/6/2006
5	Chief/Hoyt/Juab County	C # 550	Yes	10/6/2006
Snowflake				
1	Keystone/Mammoth	C # 229	No	
2	Keystone/Mammoth	C # 41	No	
3	Keystone/Mammoth	C # 484	No	
Chief Mill Site #1				
1	Chief Consolidated	C # 702	Yes	10/6/2006
2	Chief Consolidated	XE 5386-1	Yes	10/6/2006
3	Chief Consolidated	C # 604	Yes	10/6/2006
4	Godiva Silver Mines	C #168	No	
5	Godiva Silver Mines	C #168	No	
6	Okelberry	C # 23	No	
Chief Mill Tailings				
1	Okelberry	C # 23	No	
2	Okelberry	C # 639	No	
3	Chief Consolidated	XE-5378-1	Yes	10/6/2006
4	Chief Consolidated	XE-5375	Yes	10/6/2006
5	Chief Consolidated	XE 5386-1	Yes	10/6/2006
6	Chief Consolidated	XE5379-11	Yes	10/6/2006
7	Chief Consolidated	C # 604	Yes	10/6/2006

TABLE 4 – REMEDIAL ACTION STRUCTURE PROPERTIES REQUIRING ENVIRONMENTAL COVENANTS

#	Owner	Card # or Parcel ID	Environmental Covenant Recorded? (Yes/No)	Date Covenant Recorded
8	Chief Consolidated	XE-5380	Yes	10/6/2006
Chief Mine #2				
1	Godiva Silver Mines	C # 471	No	
2	Godiva Silver Mines	C # 19	No	
3	Godiva Silver Mines	C # 193	No	
4	Chief Consolidated	XE 5471	Yes	10/6/2006
5	Chief Consolidated	XE 6111	Yes	10/6/2006
6	Chief Consolidated	C # 257-B	Yes	10/6/2006
7	EPA	XD-5458-11	No	
May Day/Godiva				
1	Godiva Silver Mines	C# 29	No	
2	Godiva Silver Mines	C# 74	No	
3	Godiva Silver Mines	C# 248	No	
4	Godiva Silver Mines	C# 399	No	
5	Godiva Silver Mines	C# 383	No	
6	Godiva Silver Mines	C# 25-A	No	
7	Godiva Silver Mines	C# 260	No	
8	Godiva Silver Mines	C# 157	No	
9	Godiva Silver Mines	C# 399	No	
Chief Mine #1				
1	Keystone/Mammoth	C # 229	No	
2	Keystone/Mammoth	C # 41	No	
3	Keystone/Mammoth	C # 484	No	
4	Chief Consolidated	XE 4790	Yes	10/6/2006
5	Chief Consolidated	XE 4791	Yes	10/6/2006
6	Chief Consolidated	XE 4793	Yes	10/6/2006
7	Chief Consolidated	XE 4794	Yes	10/6/2006
8	Chief Consolidated	XE 4795	Yes	10/6/2006
9	Chief Consolidated	XE 4796	Yes	10/6/2006
10	Chief Consolidated	XE 4799	Yes	10/6/2006
11	Chief Consolidated	XE 4801	Yes	10/6/2006
12	Chief Consolidated	XE 4802	Yes	10/6/2006
13	Chief Consolidated	XE 4803	Yes	10/6/2006
14	Chief Consolidated	XE 4804	Yes	10/6/2006
15	Chief Consolidated	XE 4805	Yes	10/6/2006
16	Chief Consolidated	XE 4806	Yes	10/6/2006
17	Chief Consolidated	XE 4807	Yes	10/6/2006
18	Chief Consolidated	XE 4808	Yes	10/6/2006

TABLE 4 – REMEDIAL ACTION STRUCTURE PROPERTIES REQUIRING ENVIRONMENTAL COVENANTS

#	Owner	Card # or Parcel ID	Environmental Covenant Recorded? (Yes/No)	Date Covenant Recorded
19	Chief Consolidated	XE 4809	Yes	10/6/2006
20	Chief Consolidated	XE 4811	Yes	10/6/2006
21	Chief Consolidated	XE 4812	Yes	10/6/2006
22	Chief Consolidated	XE 4815	Yes	10/6/2006
23	Chief Consolidated	XE 4817	Yes	10/6/2006
24	Chief Consolidated	XE 4818	Yes	10/6/2006
25	Chief Consolidated	XE 4836	Yes	10/6/2006
26	Chief Consolidated	XE 4837	Yes	10/6/2006
27	Chief Consolidated	XE 4844-1	Yes	10/6/2006
28	Chief Consolidated	XE 4845	Yes	10/6/2006
29	Chief Consolidated	XE 4846	Yes	10/6/2006
30	Chief Consolidated	C # 456	Yes	10/6/2006
31	Chief Consolidated	C # 672B	Yes	10/6/2006
32	Chief Consolidated	XF 6126-F	Yes	10/6/2006
33	Chief Consolidated	XF 6115A	Yes	10/6/2006
34	Chief Consolidated	C # 659A	Yes	10/6/2006
35	Chief Consolidated	C # 567	Yes	10/6/2006
36	Chief Consolidated	C # 149	Yes	10/6/2006
37	Chief Consolidated	C # 83	Yes	10/6/2006
38	Chief Consolidated	C # 82	Yes	10/6/2006
39	Chief Consolidated	C # 207	Yes	10/6/2006
40	Loader	XE-4848	No	
41	EPA	XE-4797	No	
42	EPA	Dean Property	No	
43	City of Eureka	RR Parcel 8	Yes	Dec-05
44	City of Eureka	Alberg Street	No	
45	City of Eureka	"Hatchet" Area	No	
46	City of Eureka	South of Putnam	No	
Gardner Canyon				
1	Chief Consolidated	XE 5388	Yes	10/6/2006
2	Chief Consolidated	XE 5386-1	Yes	10/6/2006
3	Chief Consolidated	C # 702	Yes	10/6/2006
Chief Mill Site #1 Haul Road				
1	Chief Consolidated	C # 702	Yes	10/6/2006
2	Chief Consolidated	C # 703	Yes	10/6/2006
3	Chief Consolidated	C # 152	Yes	10/6/2006
4	Chief Consolidated	XE 5386-1	Yes	10/6/2006
5	Chief Consolidated	C # 21	Yes	10/6/2006
6	Chief Consolidated	C # 256	Yes	10/6/2006

TABLE 4 – REMEDIAL ACTION STRUCTURE PROPERTIES REQUIRING ENVIRONMENTAL COVENANTS

#	Owner	Card # or Parcel ID	Environmental Covenant Recorded? (Yes/No)	Date Covenant Recorded
7	Chief Consolidated	C # 256	Yes	10/6/2006
8	Chief Consolidated	C # 604	Yes	10/6/2006
9	Chief Consolidated	C # 605	Yes	10/6/2006
10	Chief Consolidated	XE 5471	Yes	10/6/2006
11	Chief Consolidated	XE 6113-21	Yes	10/6/2006
12	Godiva Silver Mines	C #168	No	
13	Godiva Silver Mines	C # 193	No	
14	EPA	XD-5458-11	No	
15	Okelberry	C # 23	No	
16	City of Eureka	RR Parcel 2	Yes	Dec-05
17	City of Eureka	Foote Trust	No	
Eagle Blue Bell				
1	Chief Consolidated	C # 141	Yes	10/6/2006
2	Chief Consolidated	C # 149	Yes	10/6/2006
3	Chief Consolidated	C # 174	Yes	10/6/2006
4	Chief Consolidated	C # 233	Yes	10/6/2006
5	Chief Consolidated	C # 236	Yes	10/6/2006
6	Chief Consolidated	C # 576	Yes	10/6/2006
7	Chief Consolidated	C # 83	Yes	10/6/2006
8	Chief Consolidated	C # 82	Yes	10/6/2006
9	Chief Consolidated	C # 76	Yes	10/6/2006
Upper Eureka Gulch				
1	City of Eureka	Part of RR Parcel 4	Yes	??
2	Betty Robinson		Yes	??
Knightsville Sediment Ponds				
1	Chief Consolidated	XE 6113-21	Yes	10/6/2006
2	Chief Consolidated	XE 6115	No	
3	Chief Consolidated	XE 6111	Yes	10/6/2006
4	EPA	XD-5458-11	No	
5	Godiva Silver Mines	C # 471	No	