Final Draft

Five-Year Review Report for Atlas Asbestos Mine Site

Prepared for

Contract No. 68-W-98-225/WA No. 058-FRFE-0934
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

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Approved by:

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Date:

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List of Acronyms

AMSC	Atlas Mine Site Committee
APCD	Air Pollution Control District
ARARs	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
BLM	Bureau of Land Management
BNG	Bitterroot Native Growers
CAA	Federal Clean Air Act
CAC	California Administrative Code
CCMA	Clear Creek Management Area
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
CVRWQCB	Central Valley Regional Water Quality Control Board
DHS	California Department of Health Services
DTSC	California Department of Toxic Substances Control
E&E	Ecology and Environment, Inc.
ESC	Environmental Strategies Corporation
EPA	United States Environmental Protection Agency
FR	Federal Register
FWPCA	Federal Water Pollution Control Act
H&S Code	California Health and Safety Code
HLA	Harding Lawson Associates
MFL	Million fibers per liter
MWD	Metropolitan Water District of Southern California
NESHAP	National Emissions Standard for Hazardous Air Pollutants
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List

Acronyms, continued

O&M	operation and maintenance
OHV	off highway vehicle
OSHA	Occupational Safety and Health Act
OU	operable unit
OUFS	Operable Unit Feasibility Study
PLM	Polarized light microscope
PM10	particulate matter less than 10 microns in diameter
POTW	publicly owned treatment works
PRPs	potentially responsible parties
RAC	Response Action Contract
RACR	Remedial Action Completion Report
RADP	Remedial Action Design Plan
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RDWP	Remedial Design Work Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RWQCB	California Regional Water Quality Control Board
SES	Scrivner Environmental Services, Inc.
SPLC	Southern Pacific Land Company
SPTC	Southern Pacific Transportation Company
TBC	To Be Considered
TSCA	Toxic Substances Control Act
USC	United States Code
WMU	Waste Management Unit

Executive Summary

The Atlas Asbestos Mine Superfund Site in Fresno County, California, consists of two operable units (OUs): the City OU and the Atlas Mine Area OU. The remedy for the City OU included the burial and capping of contaminated soils and materials on site and institutional controls. The remedy for the Atlas Mine Area OU included stabilization of erosion prone areas, structural improvements and additions, access control, and institutional controls. As a part of the Coalinga Mine Site, the City OU was removed from the Superfund National Priorities List (NPL) in April 24, 1998. The Atlas Mine Area OU is still on the NPL.

The assessment of this Five-Year Review found that the remedies were constructed in accordance with the requirements of the Record of Decisions (RODs). The remedies are functioning as designed. It is recommended that an access road at the Atlas Mine Area OU is either repaired or rerouted to insure future protectiveness, that a study is carried out to determine the best means of addressing eroding soil in the erosion prone area near the Regional Sediment Storage Area, and that better and more frequent maintenance is carried out at the revegetation sites. Because the remedies at all OUs are protective, this Site is protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name : Atlas Asbestos Mine

EPA ID: 0934, CERCLIS ID #:CAD980496863

Region: IX **State:** CA **City/County:** Coalinga/Fresno

SITE STATUS

NPL status: ❑ Final ❑ Deleted ■ Other (specify) City OU has been delisted, Atlas Mine OU on Final NPL

Remediation status (choose all that apply): ❑ Under Construction ❑ Operating ■ Complete

Multiple OUs? ■ YES ❑ NO **Construction completion date:** City OU: March 1991
Atlas Mine Area OU: January 2000

Has site been put into reuse? ❑ YES ■ NO Part of City OU has been put into reuse

REVIEW STATUS

Reviewing agency: ■ EPA ❑ State ❑ Tribe ❑ Other Federal Agency_____

Author name: Shea Jones

Author title: Remedial Project Manager **Author affiliation:** EPA, Region IX

Review period: July 2001 to September 2001

Date(s) of site inspection: March 13, July 11, and 12, 2001

Type of review: ■ Statutory
❑ Policy (❑ Post-SARA ❑ Pre-SARA ❑ NPL-Removal only
❑ Non-NPL Remedial Action Site ❑ NPL State/Tribe-lead
❑ Regional Discretion)

Review number: ❑ 1 (first) o 2 (second) ❑ 3 (third) ■ Other (specify) 2nd Review for City OU
1st Review for Atlas Mine Area OU

Triggering action:
❑ Actual RA Operation of Groundwater Remedial Systems
❑ Actual RA Start at OU#____
■ Previous Five-Year Review Report
❑ Construction Completion
❑ Other (specify)_____

Triggering action date: City OU Review: March 1995
Atlas Construction Initiation: October 1994

Due date (five years after triggering action date): March 2000 (City OU), October 1999 (Atlas OU)

1.0 Introduction

The United States Environmental Protection Agency (EPA) has conducted a Five-Year Review of the remedial actions implemented at the Atlas Asbestos Mine Superfund Site (also referred to as "Atlas Site"), located in Fresno County, California, approximately 50 miles east of Los Angeles. CH2M HILL was contracted under the EPA's Response Action Contract (RAC) IX to prepare this report which documents the results of the Five-Year Review.

The purpose of the Five-Year Review process is to evaluate whether the remedial measures implemented at the site are protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review Reports. In addition, Five-Year Review Reports identify deficiencies found during the review, if any, and provide recommendations for addressing them.

This review is required by statute and is thus, a statutory review. EPA must implement Five-Year Reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), as amended, which 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.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CPR) 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.

Consequently, this Five-Year Review has been undertaken because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unrestricted use and unlimited exposure.

This is the first Five-Year Review for the Atlas Asbestos Mine Site.

The Atlas Site includes four geographically distinct areas: i) The Atlas Mine Area; ii) The Clear Creek Management Area; (CCMA) iii) The Ponding Basin of the California Aqueduct; and iv) The City of Coalinga, California. Asbestos mining and milling waste from the Atlas Mine Area has been transported to and come to be located in the other three areas.

There are two designated operable units (OUs) for the Atlas site: the Atlas Mine Area Operable Unit (Atlas Mine Area OU, which would include the CCMA and Ponding Basin) and the City of Coalinga Operable Unit (City OU). The City OU is also considered part of the Coalinga Asbestos Mine Site due to historic operations in the Coalinga Area.

Overall, this is the first Five-Year Review for the Atlas Asbestos Mine Site. Specifically, this is the first Five-Year Review for the Atlas Mine Area OU, and the second Five-Year Review for the City OU. The triggering action for these statutory reviews is the date of the previous Five-Year Review. The Five-Year Review for the City OU was completed on March 28, 1995. No deficiencies were noted at that time. The Five-Year Review for each OU has been carried out in 2001 in order to put both OUs on the same review schedule. From this point forward, the Five-Year Review for each OU will not be carried out separately.

Thus, only one report will be used to document the Five-Year Review for both OUs of the Atlas mine site.

The Five-Year Review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. This report is divided into two parts. The first part is a review of the City OU; the second is a review of the Atlas Mine Area OU.

2.0 Site Chronology for the City OU

TABLE 1
Chronology of Site Events for the City OU

Event	Date
The Metropolitan Water District (MWD) of Southern California detected elevated levels of asbestos in California Aqueduct water samples.	1980
Coalinga Asbestos Mine and the Atlas Asbestos Mine Sites were placed on the NPL.	1984
During the investigation of the Atlas and Coalinga Sites, high levels of airborne asbestos were measured in the City of Coalinga. Subsequently, the 107-acre City of Coalinga OU of the Atlas Mine Site and the Coalinga Asbestos Mine Site was created.	1986 and 1987
Operable Unit Feasibility Study and Hazardous Substance Containment Report released by EPA.	February 9, 1989
ROD for the City OU was signed.	July 19, 1989
Remedial activities began at the City OU.	March 1990
Construction of the City OU was completed.	March 1991
Final Remedial Action Report and Operation and Maintenance Plan for City OU were accepted by the EPA.	April 1992
City OU First Five-Year Review.	March 1995
Superfund Final Closeout Report for Coalinga Mine Site.	August 1997
City OU (Coalinga Mine Site) removed from NPL	April 1998

3.0 Background for the City OU

3.1 Physical Characteristics

The City of Coalinga is in Pleasant Valley, in Fresno County, California, on the western margin of the central San Joaquin Valley in an area that includes the foothills of the Southern Diablo Range Mountains. Approximately 20 miles northwest of Coalinga in the Diablo Range is the New Idria Formation which is the largest known serpentine deposit in the Coalinga region. Extensive mining has been conducted in the southeastern third of the New Idria Formation for chromite ore, chrysotile asbestos ore, and other serpentine related minerals.

The City of Coalinga OU is located along Highway 198 at the southwestern end of the City of Coalinga, Fresno County, California (see Attachment 1). The City OU consists of approximately 107 acres situated between 4th Street and the intersection of Lucille Avenue and Highway 198. The nearest population center is an apartment complex and housing development that is located just northeast of the Waste Management Unit (WMU) and within the boundaries of the OU. In addition, a retail center is also located

within the OU. The City of Coalinga (approximate population of 9,800) is located immediately to the northeast.

3.2 Land and Resource Use and History of Contamination

The Southern Pacific Railroad property within the 107-acre City OU consisted partly of a portion of the original operating right-of-way acquired by Southern Pacific Railroad Company (a predecessor of Southern Pacific Transportation Co.) pursuant to the July 27, 1866 Act of Congress, and partly of ancillary lands acquired pursuant to the same Act patented July 10, 1894. During Southern Pacific's ownership, several properties were leased to various entities which were active in the milling, manufacture, storage and/or transportation of asbestos materials from the mid-1950s until approximately 1980. Over time, most of Southern Pacific's holdings were sold. The land which contains the City OU WMU is the property of Union Pacific, successor to Southern Pacific Transportation Co. (SPTC).

In September 1984, an asbestos mine located in the New Idria Formation and a mill (the JMM) located immediately southeast of the Formation were listed on the Superfund National Priorities List (NPL) as the Atlas Asbestos Mine Superfund Site and the Coalinga Asbestos Mine Superfund Site. During investigation of these sites, EPA conducted an airborne asbestos sampling program in which high asbestos readings were measured in the City of Coalinga. Further investigation revealed that asbestos had been transported from the mines and mills to storage areas within the City of Coalinga for handling and shipment. In August 1987, EPA issued an administrative order pursuant to CERCLA Section 106 (Order87-04) to SPTC requiring them to conduct a Remedial Investigation at the City of Coalinga. Soil sampling confirmed the presence of uncontrolled hot spots of asbestos and nickel contamination over a 107-acre area in the City of Coalinga. EPA ordered SPTC to prepare an Operable Unit Feasibility Study (OUFS) to develop and evaluate remedial alternatives for the site. On February 9, 1989, EPA released the OUFS and the Hazardous Substance Containment Report explaining EPA's proposed plan for cleanup.

Contamination in the northern portion of this area was associated with the Atlas storage, handling, and shipping operations, while contamination in the southern portion was associated with the Johns-Manville storage, handling, and shipping operations. Although cleanup could have proceeded as two separate operable units, EPA decided it would be more expeditious to combine the cleanup of the entire 107-acre area into a single operable unit, designating it the City of Coalinga Operable Unit.

Contaminated soils, equipment, and other waste materials were removed during remediation and permanently buried in the onsite WMU. Two buildings known as the Marmac Warehouse and the Echo Transport Building were partially dismantled and the contaminated material was also placed in the WMU. The remaining steel superstructures of the buildings were left onsite after being decontaminated by steam cleaning and application of an encapsulant. A deed restriction was placed only on the property occupied by the WMU; EPA considered cleanup of the remainder of the site to be complete, including the Marmac Warehouse and the Echo Transport Building.

Consistent with EPA's objective of restoring Superfund sites to safe and productive use, commercial and residential redevelopment has occurred or is in progress on some parts of the site. Following EPA's issuance of a Certificate of Completion of cleanup for the site, the City of Coalinga arranged to remove the remaining superstructure of the Marmac Warehouse to make way for a new housing development project. This development has since been completed. Cleanup of that area was considered complete, so standard demolition practices were used. Other redevelopment of portions of the site included construction of a K-Mart store.

3.3 Initial Response

The Atlas Asbestos Mine and Coalinga Asbestos Mine Sites were approved for listing on the NPL in September 1984.

During an airborne asbestos sampling program in 1986 and 1987, conducted as part of the Remedial Investigation and designed to measure airborne emissions from the Atlas and Coalinga Sites, high asbestos readings were measured in the City of Coalinga. Based on this data, a study was initiated to look for possible sources of asbestos in Coalinga. On June 17 and 18, 1987, EPA conducted a limited soil/waste material sampling and analytical program in Coalinga. This study showed chrysotile asbestos occurrence from less than one (1) percent to fifty (50) percent in the Coalinga area. Further investigation revealed that a major landowner in the contaminated area was SPTC. In August of 1987, EPA issued an administrative order pursuant to CERCLA Section 106 (Order No. 87-04) to SPTC, requiring SPTC to conduct a Remedial Investigation at the City of Coalinga site (i.e., an intensive sampling program to identify and quantify sources of mining waste contamination). As a result of the Remedial Investigation, areas contaminated with residual asbestos ore waste were found throughout the City of Coalinga site. SPTC was also ordered to prepare an OUFS to develop and evaluate remedial alternatives for the City of Coalinga site. EPA released the OUFS and information concerning EPA's proposed plan for cleanup of the City of Coalinga site on February 9, 1989.

In response to Order No. 87-04, SPTC also performed interim measures to stabilize the waste materials during the more detailed investigation. These tasks included: (i) limiting access to contaminated areas with fencing, (ii) posting warning signs, (iii) spraying biodegradable sealant to control dust emissions, and (iv) covering waste ore piles with plastic sheeting. These interim measures were performed in the fall of 1987; a second spraying of sealant took place in the spring of 1988, and a third spraying took place in June of 1989.

3.4 Basis for Taking Action

3.4.1 Contaminants

Hazardous substances that have been released at the site in each media are listed in the table below:

TABLE 2
Contaminants at the City OU

Soil	Ore Waste	Air
Asbestos	Asbestos	Asbestos
Nickel	Nickel	--

The primary contaminant of concern for this site was asbestos. The principal threat posed by uncontained asbestos is from inhalation of airborne fibers. Exposure to asbestos through inhalation is known to cause lung cancer, mesothelioma, and asbestosis in humans.

4.0 Remedial Actions for the City OU

4.1 Remedy Selection

The Record of Decision (ROD) for the City of Coalinga OU was signed on July 19, 1989. As previously mentioned and stated in the ROD, the principal threat posed by uncontained asbestos close to residential areas comes from airborne emissions. The purpose of this remedy was to limit airborne emissions from the asbestos- and nickel-contaminated soils.

The remedial action selected in the ROD addresses a problem specific to a populated area. Asbestos piles in Coalinga were to be removed, consolidated, and permanently buried so that releases of asbestos fibers to the air were minimized.

The major components of the selected remedy in the ROD include the following:

1. The removal and consolidation of the asbestos- and nickel-contaminated soils at this site that: (a) exceed 1 area percent asbestos using polarized light microscopy (PLM), (b) display the light-grey coloring characteristics of asbestos contaminated soils and/or (c) contain nickel at levels in excess of background. Areas displaying light-grey coloring will be remediated until no light-grey color is visible and only light brown soil remains by visible inspection; confirmation will be by 1 area percent PLM.

2. Removal and consolidation of waste materials and equipment that exceed the levels set forth in paragraph 1, immediately above.

3. Decontamination of buildings to less than or equal to 1 percent by PLM.

4. Construction of an underground, onsite WMU to bury permanently the consolidated contaminated substances under an impermeable cap. The impermeable cap will consist of a compacted soil foundation layer overlain by an impermeable clay mat, covered by a second soil layer.

5. Use of strict dust control measures to limit the release of asbestos fibers from the Site during the Remedial Action work.

6. Confirmation sampling to ensure achievement of the cleanup standards.

7. Groundwater monitoring and continuous monitoring of soil moisture content using neutron probes.

8. Regrading of areas where contaminated soils have been removed.

9. Placement of deed restrictions on the Site property where the WMU and soil cover exist, to prevent the disturbance of the cap and possible release of asbestos fibers or nickel contaminants.

4.2 Remedy Implementation

The contaminated structures and areas at the site were divided into four areas based on geography:

- The Marmac Warehouse located on Elm Avenue (Highway 198). This was a chromite ore distribution center with approximately 1,600 cubic yards of chromite ore and asbestos-contaminated waste.

- The storage yard located approximately 1 mile south of the Marmac Warehouse on Elm Avenue. It contained stacked pipes contaminated with asbestos.

- The Atlas shipping yard located in the vicinity of Glenn Avenue and 6th Street. It was used as an asbestos distribution center.

- The U.S. Asbestos Company consisting of 9 acres located at the southern border of the site and containing piles of raw asbestos ore. The Echo Transport Building is located in this area.

Cleanup of the site included the removal and consolidation in the WMU of contaminated soils that exceeded 1 area percent asbestos using PLM, soils that contained nickel at levels in excess of background, and any soils that displayed light-grey coloring characteristics of asbestos contamination. Equipment and other waste materials that exceeded 1 area percent asbestos were also moved to the WMU. The Marmac Warehouse and the Echo Transport Building were partially dismantled, and the contaminated material was placed in the WMU. The remaining steel superstructures of the buildings were left onsite after being decontaminated by steam cleaning and application of an encapsulant.

Remedial activities began in March 1990, and construction of the WMU was completed in March 1991. Confirmation sampling showed that the cleanup levels had been met, and a final inspection was conducted in October 1991. Following remedial response, the onsite WMU was the only area of the site on which a deed restriction was placed. The deed restriction was put in place on June 21, 1990 by the Southern Pacific Transportation Company ("Owner"), which is the owner of the property at the southern end of the City of Coalinga along State Highway 198 (Elm Street). This deed restriction will prohibit anyone in possession of the property from taking any actions that would interfere with the maintenance or operation of the WMU which was constructed pursuant to the Consent Decree entered into by and between Owner and the United States of America on behalf of the U.S. Environmental Protection Agency. The EPA considered cleanup of all other areas of the site complete. EPA accepted the final Remedial Action Report and an Operation and Maintenance Plan for the WMU in April 1992. The previous Five-Year Review found the WMU to be secure and operating as designed.

4.3 System Operation/Operation and Maintenance

The Operation and Maintenance (O&M) Plan for the City OU dated January 1992 was approved by EPA. O&M activities for the City OU currently include annual inspections for cap integrity, surface water ponding, fence integrity, and repairs as necessary. There is also a provision for specific monitoring in the event of a natural disaster (100-year flood, catastrophic earthquake). O&M activities for the City OU are being conducted in accordance with the O&M Plan. The most recent inspection was conducted in May 2001. Union Pacific, successor to SPTC, will continue to perform annual inspections and provide EPA with inspection reports. DTSC will be responsible for oversight of the O&M work at the site once an agreement is signed with the PRPs.

Previous post-cleanup operation and maintenance has included performing vadose zone monitoring and conducting regularly scheduled inspections of the WMU. Periodic inspections were conducted by EPA and SPTC to assess the condition of the WMU and document any damaged areas or areas requiring corrective action. Quarterly inspections were performed during the first 3 years beginning in June 1991, and annual inspections have been conducted thereafter.

A groundwater monitoring program was developed and would have been implemented if significant moisture increases had been detected. Vadose zone monitoring was performed quarterly for the first year beginning in June 1991, then semi-annually for the second and third years, and annually for the fourth and fifth years. Regularly scheduled vadose zone monitoring was terminated as planned after five years, with the final event in May 1995, because no increases in moisture content greater than 5 percent over background baseline conditions (adjusted after the early quarterly events in 1991) were detected. Future vadose zone monitoring is only anticipated in the event of a natural disaster such as a flood, in which case Union Pacific will immediately report the results to EPA. In that event, Union Pacific will compare the vadose zone monitoring results to baseline conditions to determine if an increase in moisture above the 5 percent limit has occurred and if the groundwater monitoring program should be initiated. Should groundwater monitoring be required, the program would entail the installation of three monitoring wells and quarterly sampling for nickel and asbestos.

In the event of a natural disaster such as an earthquake or flood, the PRP conducts inspections independent of other scheduled inspections. One such inspection was conducted on April 2, 1994, following the occurrence on March 31 of two earthquakes measuring 4.2 and 4.4 on the Richter scale whose epicenters were 5 miles northeast of Coalinga. Vadose zone monitoring was conducted to monitor changes in the moisture content in the WMU. A significant increase in moisture content of the WMU would have indicated the potential for the downward transport of contaminants to groundwater.

The only problem identified during the previous Five-Year Review and more recent inspections of the WMU is damage from burrowing animals to the cap and areas around the neutron probe vadose zone monitoring access tubes. Also, the irrigation system currently requires repairs and is not functional;

however, the vegetation on the cap is such that irrigation is not necessary. According to Union Pacific, the burrow holes are generally shallow and do not impair the performance of the WMU cap. When damage has been identified, Union Pacific has directed their maintenance contractor to make repairs. The Union Pacific maintenance contractor visits the WMU at least once per month to monitor cap vegetation, apply fertilizer or to reseed if necessary, clear vegetation from the area immediately surrounding the WMU, remove deep-rooted vegetation that might damage the integrity of the WMU, and fill burrow holes.

5.0 Progress Since the Last Five-Year Review for the City OU

Since the last Five-Year Review, the Final Closeout Report for this site was issued in August 1997, and the Coalinga Asbestos Mine Site was removed from the NPL. The EPA announced its intent to delete the Coalinga Asbestos Mine (Johns-Manville Mill and City OU) Superfund Site from the NPL in the November 19, 1997 Federal Register, and the site was deleted April 24, 1998. EPA based its decision on the observation that all appropriate response actions required for the site had been implemented. Even if a site is deleted from the NPL, where hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, EPA requires review of remedial elements at least every five years after the initiation of the remedial action. Whenever there is a significant release from a site deleted from the NPL, the site may be restored to the NPL without application of the Hazard Ranking System. If new information becomes available which indicates a need for further action, EPA may initiate remedial actions.

Maintenance has been conducted as planned. No other noteworthy events have taken place.

The previous Five-Year Review recommendations were:

1. Perform additional sampling to compare asbestos levels at redeveloped areas to offsite levels.

2. Remove the Echo Transport Building.

Neither of these actions have taken place. Recommendation 1 was not carried out since it was later determined that it would be difficult to draw any meaningful conclusions from a sampling effort. As noted in the Atlas Remedial Investigation Report and Phase I of Johns-Manville Coalinga Remedial Investigation Report, there are multiple sources of asbestos in the Los Gatos Creek drainage basin. Streams naturally erode and transport asbestos from abandoned mines (such as the Atlas Asbestos Mine), tailings, and the New Idria Serpentine Mass to downstream areas, such as the City of Coalinga. Thus, it may be difficult to distinguish between “background” asbestos levels and elevated asbestos levels. In addition, analysis of ambient asbestos fibers in air tends to be difficult because the fibers tend to be short and thin, and other particulate matter may mask the fibers.

After the first Five-Year Review, Union Pacific discussed whether or not Recommendation 2 should be implemented or not. Union Pacific finally determined not to implement Recommendation 2 because the removal of the Echo Transport Building would have no impact on human health and the environment. The remaining structure of the Echo Transport Building, which is currently behind a locked fence, is not contaminated with asbestos. EPA concurred with Union Pacific’s decision. Therefore, Recommendation 2 was not carried out.

6.0 Five-Year Review Process for the City OU

6.1 Administrative Components

Members of Union Pacific and the State Department of Toxic Substances Control (DTSC) were notified of the initiation of the Five-Year Review on July 9, 2001. The Five-Year Review team was led by Shea Jones of EPA, Remedial Project Manager for the City OU, and included members from the Regional Technical Advisory staff with expertise in biology and risk assessment. CH2M HILL was contracted by EPA to provide support for this review.

From July to September 2001, the review team established the review schedule whose components included:

- Community Notification
- Document Review
- Site Inspection
- Five-Year Review Report Development and Review

6.2 Community Notification

Based upon the previous Five-Year Review and the current status at the City OU, community involvement was limited to the production and distribution of a fact sheet summarizing the results of the Five-Year Review.

6.3 Document Review

This Five-Year Review included a review of relevant documents (see Attachment 2). Applicable or relevant and appropriate requirements (ARARs) were also reviewed to determine if any regulatory changes have occurred since the last Five-Year Review was conducted that would impact the protectiveness of the remedy.

6.4 Site Inspection

Two site inspections were conducted for the City OU Five-Year Review. These site inspections were performed by EPA on December 21, 2000 and July 11, 2001. During the December 21, 2000 site visit, it was noted that portions of the site had been redeveloped into a shopping center (K-Mart) and a residential subdivision, and that other portions of the site were available for redevelopment. The property occupied by the WMU, which is controlled by a deed restriction, was fenced, and the perimeter clear of vegetation. The WMU cover was in excellent condition. Although the WMU fence and signs were in good condition, the lock to the front gate was open. Union Pacific was notified of the problem and replaced the lock.

During the July 11, 2001 site visit, the fence, lock, and WMU cover were all observed to be in good condition, and the perimeter was observed to be clear of vegetation. The only deficiencies noted were that a sign was damaged and there were several animal burrows on the northeastern and northwestern perimeter of the WMU. Photos from that site inspection can be found in Attachment 3.

7.0 Technical Assessment for the City OU

Question A: Is the remedy functioning as intended by the decision documents?

The site inspection and review of documents, ARARs, and risk assumptions indicates that the remedy is functioning as intended by the ROD. The City OU has achieved the remedial objectives to reduce the

exposure of asbestos.

Operation and maintenance of the WMU has, on the whole, been effective. A few areas showed evidence of burrowing of small animals. The burrows did not penetrate beyond the soil layer, and so did not affect protectiveness. The Union Pacific maintenance contractor regularly inspects and repairs small animal burrows. There are no indications of any difficulties with the remedy.

There were no opportunities for system optimization observed during this review. Operation and maintenance activities are already minimal.

TABLE 3
Changes in Chemical-Specific Standards at City OU

Contaminant	Media	Cleanup Level	Previous Standard/Requirement	Citation/Year	New Standard/ Requirement	Significance of Changes
Asbestos	Bulk materials (e.g., soil, rock)	N/A	Use of polarized light microscopy (PLM) measurement technique for asbestos	TSCA, Asbestos Hazard Emergency Response Act (AHERA), 52 FR 41846: 1987	None	None
Asbestos	Air	N/A	Air cleaning– requires user of air cleaning devices for asbestos control to meet certain requirements	CAA, Asbestos NESHAP, 40 CFR 61.152: 1984 (amended 1986 and 1990)	None	None
Asbestos	Air	N/A	Reporting– requires asbestos waste producers subject to 40 CFR 61.149, 61.150, 61.151, and 61.154 to report certain information to EPA	CAA, Asbestos NESHAP, 40 CFR 61.153: 1984 (amended 1990 and 1991)	None	None
Asbestos	Air	N/A	Cross reference to other asbestos regulations	CAA, Asbestos NESHAP, 40 CFR 61.156: 1990 (amended 1995)	None	None
Nickel	Mining Waste	N/A	Classifies nickel-beraing waste as Class B mining waste	CAC, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2571(b)(2)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 7, Subchapter 1, Article 1, Section 22480(b)(2)	None
Nickel	Mining Waste	N/A	Allows RWQCB to exempt mining waste piles from liner and leachate collection and removal requirements if demonstrate that leachate will not form in our escape from unit	CAC, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2570(b)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 7, Subchapter 1, Article 1, Section 22470(b)	None
Nickel	Waste	N/A	Allows RWQCB to exempt Group B mining waste unit from certain provisions of Article 7 if comprehensive hydrogeologic investigation demonstrates that (1) there are only very minor amounts of groundwater underlying the area or (2) the discharge is in compliance with the applicable water quality control plan and (3) either natural conditions or containment structures will prevent lateral hydraulic interconnection with	CAC, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2570(c)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 7, Subchapter 1, Article 1, Section 22470(c)	None

CAA = Federal Clean Air Act
CAC = California Administrative Code
CCR = California Code of Regulations
CFR = Code of Federal Regulations
H&S Code = California Health and Safety Code
NESHAP = National Emissions Standard for Hazardous Air Pollutants
TSCA = Toxic Substances Control Act

The only institutional control that is in place is a deed restriction on the property occupied by the WMU. No activities were observed during the most recent inspection that would have violated the institutional controls. The cap and the surrounding area were undisturbed. The fence around the City OU was intact and in good repair. Only one sign was damaged and in need of repair.

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?

There have been no changes in the physical conditions of the City OU that would affect the protectiveness of the remedy.

TABLE 4
Changes in Action-Specific Requirements at City OU

Action	Previous Requirement	Citation/Year	New Requirement	Significance of Changes
Construction	Permissible exposure limit (PEL) of 0.2 asbestos fibers per cubic centimeter (f/cc) of air for occupationally exposed workers and action level of 0.1 f/cc as 8-hr. time weighted average	OSHA, 51 FR 22612 (1986)	Amended to cover workers in additional labor classifications	None

CFR = Code of Federal Regulations
FR = Federal Register
OSHA = Occupational Safety and Health Act

TABLE 5
Changes in Location-Specific Requirements at City OU

Location	Previous Requirement	Citation/Year	New Requirement	Significance of Changes
City OU	Activities carried out by Federal agencies should not jeopardize continued existence of endangered species identified at site or cause adverse modifications of critical habitat	16 U.S.C. 1536 (a)(4) 1973	None	None
City OU	Established guidelines for minimizing habitat loss	U.S. Fish and Wildlife Service Mitigation Policy – 46 FR 7644-7663, January 1981	None	None

FR = Federal Register
USC = United States Code

No significant revisions to the standards have been made that affect the protectiveness of the remedy.

No new standards have been promulgated that affect the protectiveness of the remedy.

No significant revisions have been made to To Be Considereds (TBCs) that affect the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

An ecological assessment was not performed as part of remedial activities for the City OU because of the nature of the site. Because of the lack of changes of land use at the site and surrounding area, it was not deemed necessary to perform an ecological risk assessment for this Five-Year Review.

No weather- or seismic-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the documents and data reviewed, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the City OU that would affect the protectiveness of the remedy. There have been no changes in the standards that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

8.0 Issues for the City OU

TABLE 6

Issues for the City OU

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Evidence of small animal burrows at a few locations of the WMU cap	N	N
Signs damaged	N	N

9.0 Recommendations and Follow-up Actions for the City OU

TABLE 7

Recommendations and Follow-up Actions for the City OU

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Animal burrows in WMU cap	Repair current burrows	Union Pacific	DTSC	Ongoing	N	N
Signs damaged	Repair sign	Union Pacific	DTSC	Ongoing	N	N

10.0 Protectiveness Statement for the City OU

The remedy at the City OU is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. All threats at the City OU have been addressed through the burial of contaminated material in the WMU, the installation of fencing and warning signs, regular maintenance of the WMU, and the implementation of institutional controls.

11.0 Next Review for the City OU

The next Five-Year Review for the Coalinga Asbestos Mine Superfund Site is required by September 2006, five years from the date of this review.

12.0 Site Chronology for the Atlas Mine Area OU

TABLE 8
Site Chronology for the Atlas Mine Area OU

Date	Event
1967 to 1979	Asbestos mining and milling at the Atlas Mine OU.
December 3, 1976 and February 15, 1980	Atlas Asbestos Company and Wheeler Properties cited for violating the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulations regarding control of asbestos emissions.
1980	The Metropolitan Water District (MWD) of Southern California detected elevated levels of asbestos in water samples from the California Aqueduct. A sampling program suggested that the Atlas Mine Area was a probable source of asbestos.
	The Central Valley Regional Water Quality Control Board (CVRWQCB) and the California Department of Health Services (DHS) inspected the Atlas Mine Area. The CVRWQCB concluded that corrective actions were required.
September 21, 1984	Atlas Asbestos Mine Site was placed on the National Priority List (NPL).
April 1990	RI/FS Report and Proposed Plan for the Atlas Site revealed for public comment.
February 14, 1991	The ROD for the Atlas Mine Area OU signed.
August 13, 1992	Consent Decree entered.
October 1994	Remedial Action Design Plan approved.
August 18, 1994	Contract awarded to Scrivner Environmental Services, Inc. (SES) for construction.
September 21, 1994	EPA Region IX issued Notice to Proceed with Remedial Action.
October 7, 1994	Atlas Mine Site Committee (AMSC) issued Notice to Proceed with construction to SES.
May 15 to June 14, 1996	SES completed pre-final inspection punchlist items such as the removal of debris near Pond D and former mill area and the removal of surplus construction material.
1999	Re-paved double chip sealed access road from lower site gate to upper site gate.
January 18, 2000	Preliminary Close Out Report signed; construction phase complete.

The Atlas Asbestos Mine site was listed by the EPA on the final NPL on September 21, 1984. State of California regulatory agencies who have been involved with response and cleanup activities at this site include the Central Valley Regional Water Quality Control Board (CVRWQCB) and the California Department of Health Services, Toxic Substances Control Division (currently known as the California Environmental Protection Agency, Department of Toxic Substances Control [DTSC]).

13.0 Background

13.1 Physical Characteristics

The Atlas Mine Area OU is an abandoned asbestos mine within a large region of naturally occurring asbestos minerals (see Attachment 4). It is also within the Bureau of Land Management's (BLM) Clear Creek Management Area (CCMA). The property is approximately 20 miles northwest of Coalinga, in Fresno County, California. The site is approximately 140 acres and situated at an approximate elevation between 4,000 and 5,000 feet above sea level. The nearest population center is Coalinga (population 8,250) located approximately 18 miles to the southwest of the mine site.

13.2 Land and Resource Use and History of Contamination

The Atlas Mine Area lies within approximately 124 square kilometers (48 square miles) of serpentine rock (the New Idria Formation) containing large amounts of naturally occurring chrysotile asbestos (asbestos) as well as other minerals associated with serpentine.

The Atlas Mine Area OU included three open pit asbestos mine surface stockpiles of asbestos waste material, an abandoned mill building, a settling pond, and debris. The area is drained by intermittent streams, which drain into the White Creek Watershed into Los Gatos Creek through the Arroyo Pasajero drainage basin, into a Ponding Basin, and intermittently into the California Aqueduct. Adjacent land uses include mining, ranching, farming, and recreation (camping, hiking, hunting, and mineral collection.) The site is accessed by either a BLM dirt road north of the site near Spanish Lake or from a private dirt road located north of Los Gatos Road. AMSC approval is required to gain site access. Both access roads to the site contain locked gates with keys managed by BLM.

In the mid-1950's, an investigation by the California Division of Mines and Geology indicated that the serpentine matrix of the New Idria Formation was mainly chrysotile asbestos. Subsequent investigation in the southeastern third of the New Idria Formation demonstrated that the asbestos ore could be mined and milled to produce a marketable short-fiber asbestos product. From 1959 through 1962, the Coalinga and Los Gatos Creek areas experienced an intensive land rush for asbestos mining claims. In 1962, the Atlas Minerals Division of the Atlas Corporation acquired title to a large block of claims and began construction of an asbestos mill at the Atlas Mine Area. Asbestos mining and milling at the Atlas Mine Area occurred from 1967 to 1979. The Vinnell Mining and Minerals Corporation, in a joint venture with California Minerals Corporation, owned and operated the mining and milling operation from 1967 until 1974, when they sold it to Wheeler Properties. Wheeler Properties operated the facility until 1979 and filed for bankruptcy shortly thereafter.

The mining activity included digging the asbestos ore out of surface pits and then milling the ore. The by-products of the milling process (the mill tailing) were bulldozed into piles near the mill building. Approximately 2.3 million cubic meters (3 million cubic yards) of asbestos ore and asbestos tailings remain at the Atlas Mine Area OU.

On December 3, 1976, and on February 15, 1980, Atlas Asbestos Company and Wheeler Properties were cited for violating the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulation regarding control of asbestos emissions.

In early 1980, the Metropolitan Water District (MWD) of Southern California detected elevated levels of asbestos in water samples from the California Aqueduct near Los Angeles. An extensive sampling program along the Aqueduct, conducted by the MWD in August through September of 1980, suggested that the Atlas Mine was one probable source of asbestos in the California Aqueduct. Asbestos levels of up to 2,500 million fibers per liter (MFL) were measured.

On October 17, 1980, the Central Valley Regional Water Quality Control Board and the California Department of Health Services (DHS) inspected the Alias Mine Area to determine if waste discharges from these facilities were in compliance with state regulations. The board concluded that additional corrective measures should be taken to prevent mine- and mill-generated asbestos from entering the drainage basins.

13.3 Initial Response

In March of 1983, the board collected four surface water samples during a period of high run-off in the Arroyo Pasajero watershed. Asbestos fiber concentrations in these samples ranged from 80,000 to 240,000 MFL.

On June 14, 1983, the risks represented by the Atlas Mine Area were rated using the Hazard Ranking System. The Atlas Site was placed on the NPL in September 1984. Remedial Investigation/Feasibility Study (RI/FS) activities were initiated by the EPA in 1985.

During an airborne asbestos sampling program in 1986 and 1987, conducted as part of the Remedial Investigation and designed to measure airborne emissions from the Atlas Asbestos Mine and Coalinga Asbestos Mine Sites, high asbestos readings were measured in the City of Coalinga. Based on this data, a study was initiated to look for possible sources of asbestos in Coalinga. As a result of this investigation, the City OU, an OU of both the Atlas Asbestos Mine and Coalinga Asbestos Mine Sites, was designated.

The Atlas Minerals Division of the Atlas Corporation, Vinnell Mining and Minerals Corporation, Wheeler Properties Inc., the California Mineral Corporation and the BLM were identified as Potentially Responsible Parties (PRPs) at the Atlas Mine OU. On October 13, 1987, and on June 23, 1988, general notice letters were sent to these PRPs, notifying them of their potential liability.

13.4 Basis for Taking Action

13.4.1 Contaminants

The hazardous substance that has been released at the site in soil, water, and air is asbestos. Exposure to airborne asbestos fibers is known to cause lung cancer, mesothelioma, and asbestosis in humans.

14.0 Remedial Action

14.1 Remedy Selection

The ROD for the Atlas Mine Area OU was signed on February 14, 1991. Asbestos waste at the Atlas Mine Area OU presented three major problems:

1. Generation of airborne asbestos on-site by vehicular or other human disturbance;

2. The transport of asbestos from the Atlas Mine Area by vehicles which have been driven through the Atlas Mine Area; and

3. The release of chrysotile asbestos from the Atlas Mine Area into local creeks during heavy rains and the potential for this asbestos to subsequently become airborne at downstream locations.

Clean up of the asbestos at the Atlas Mine Area OU includes controlling the release of asbestos from and restricting access to the Atlas Mine Area using engineering and institutional controls. The selected remedy entails:

1. Fencing or other appropriate controls to restrict access to the Alias Mine OU;
2. Paving the road through the Atlas Mine Area or implementing an appropriate road maintenance alternative;
3. Constructing stream diversions and sediment trapping dams to minimize the release of asbestos into local creeks;
4. Conducting a revegetation pilot project to determine whether revegetation is an appropriate means of increasing stability and minimizing erosion of the disturbed areas and implementing revegetation if it is found to be appropriate;
5. Dismantling of the mill building and disposing of debris;
6. Filing deed restrictions; and
7. Implementing an operation and maintenance program.

Stabilization and control of asbestos waste will minimize the release of asbestos, thus providing long-term protection of human health and the environment.

Operation and maintenance activities will be required to ensure the effectiveness of the response action. In the event of a natural event such as a flood or earthquake, all repairs necessary to contain the hazardous substances will be made. Because the asbestos waste will not be treated, long term management of the waste is required. EPA is performing periodic reviews of the remedial action pursuant to CERCLA Section 121(c).

14.2 Remedy Implementation

The Remedial Action Design Plan (RADP) was approved June 22, 1994. Harding Lawson Associates (HLA) was retained by the AMSC to observe the work and assure conformance with the Remedial Action Design Plan. All construction and field construction management were provided by Scrivner Environmental Services, Inc. (SES). Project activities from 1992 – June 1999 were managed by HLA where project management responsibilities were transferred to ESC (Environmental Strategies Corporation).

Construction activities began on October 20,1994, and continued until May 5, 1995, when rain and surface-water accumulation forced suspension of construction activities. Construction resumed on September 11, 1995, and was completed on January 12, 1996.

14.2.1 Surface Impoundments

Ponds A, B, D, E, and G were constructed as designed in the RADP. Pond F was deleted from the remedial action as part of the Remedial Design Modifications (Revised) letter from the AMSC to the EPA dated October 19, 1995. Pond C construction was completed without removing all of the silt that had accumulated in the bottom during the heavy rains of spring 1995. The volume of sediment and water storage in each of the Ponds is as required in the RADP and includes the volume of the annual sediment load and the volume from a 25-year storm event. The impoundments were constructed to pass the flow from a 100-year storm event through a piped spillway or outlet structure and discharge into the existing channels downstream. The Pond F area was graded to direct surface water into a ditch that intersects Pond E dissipater pad area.

Ponds A, B, C, E, and G were constructed with a piped outlet structure and Pond D was constructed with an open channel spillway structure. Two sediment storage areas were constructed: one near Ponds A and B that has at least a one-year pond capacity and one near Pond E that has at least a six-year site capacity. These storage areas are located adjacent, or as near as possible, to the impoundments so as not to interfere with runoff or contribute to sediment deposition within the impoundments.

14.2.2 Channel Protection

Channels were constructed to prevent further erosion of existing tailings from the previous asbestos mining operation. The two channels constructed are Channel A and Channel B located on the west and northeast areas of the site, respectively. The graded channels are protected with rock-filled gabions with filter fabric beneath the gabions to prevent fine-grained underlying soil from migrating through the gabions. Channel A is approximately 1,500 feet in length with slopes ranging from approximately 10 percent to 41 percent. The lower end of Channel A was shortened by approximately 30 feet to minimize destruction of existing vegetation stabilizing slopes in the area against erosion. Channel B cuts through native soil and rock adjacent to tailings on the east side of the site. The channel is approximately 1,400 feet in length with slopes ranging from approximately 1 percent to 26 percent. Sideslopes are nearly vertical where the channel was constructed into existing rock. The lower end of Channel B was shortened by approximately 30 feet due to groundwater seeps and narrowed by approximately 3 feet in areas with steep, rocky side slopes.

14.2.3 Other Diversions and Site Improvements

The roadside ditch along the Pond A access road was constructed to intercept surface-water flow and divert the water away from the site toward Diversion Channel B. The Pond A access road was realigned along the cutslope above Pond B in order to maintain access to Pond A during substantial storm events. Storm-water diversion berms were constructed north of Pond B area to divert runoff from upland areas around disturbed areas toward Diversion Channel A and to divert runoff from within the disturbed area to surface impoundments.

A double bituminous paved cap was constructed on the main access road through the site to minimize dust emissions and provide improved access for future maintenance activities. The cap was constructed with two layers of imported chipped and cleaned rock and bituminous material conforming to ASTM D2397. The gates on the main access road were relocated as shown on the Record Drawings in the Remedial Action Completion Report (RACR). A soil stabilizer was applied to ponds access roads to minimize dust emissions.

14.2.4 Mill Site Area

Two steel storage tanks containing asbestos and miscellaneous scrap metal were demolished from the former Mill Site area. The scrap metal and material were buried in the disposal area shown on the Record Drawings (which can be found in the RACR). Although not a part of the approved remedial design, a pool of oil located near the Mill Site area was mixed with chemical nutrients to encourage bioremediation and buried in the disposal area.

14.2.5 Supplemental Site Modifications

Supplemental Site modifications were constructed at the Rover Pit area and the Pond A access road in response to an EPA request dated June 13, 1995, a site inspection coordinated with Ecology and Environment, Inc. (E&E), and several teleconferences among all parties associated with the project. The final revised design modifications were submitted to the EPA in a letter from the AMSC dated October 19, 1995. Supplemental design modifications were approved by EPA in their February 1, 1996 letter. Construction of the design modifications is described below.

The bottom of the Rover Pit was regraded and compacted to route runoff to an armored controlled outlet. The outlet was lined with filter fabric and filled with riprap to minimize erosion. The modification was constructed to minimize uncontrolled flow from the mining face through the pit.

A surface-water diversion was constructed across a part of the Pond A access road north of the road realignment. The original design specified the installation of an 18-inch corrugated metal pipe (CMP). During the 1995 field construction activities, a field modification was made by the supervising construction manager to use a water bar (diversion) for drainage rather than an 18-inch CMP. The decision was made to minimize future CMP maintenance requirements.

In addition, Channel B and sedimentation storage markers were modified (telephone poles were used instead of staff gauges due to unavailability of material) at the request of EPA under the direction of Environmental Strategies Corporation. The site modifications were reviewed and approved by EPA's contractor CH2M HILL in September of 1999 and constructed in October and approved in November of 1999.

14.2.6 Revegetation

The selected remedy specified by the Record of Decision required that a revegetation study be conducted to evaluate whether native vegetation could be established on disturbed areas of the Atlas Mine Area OU. Consequently, in 1994 the Bureau of Land Management contracted with Bitterroot Native Growers (BNG) of Corvallis, Montana to conduct a revegetation project for the site. The project involved a pilot study followed by three phases of planting. During the planting phases, 3,100 cubic yards of soil amendment were applied to 18.5 treatment acres, over 10,000 individual plants were planted, and 9.26 acres of the treated area were hydroseeded.

Field trials were conducted in late 1994 and 1995 with the planting of a Pilot Project study area, located within the perimeter of Pond D, to test the species and soil amendments at the site and to determine effective field techniques for conducting full-scale revegetation. A revegetation pilot program was implemented in the southwest section of Pond D above the high-water line, as required in the Consent Decree. The revegetation pilot program was implemented by Bitterroot under contract to BLM and AMSC. The pilot study was designed to evaluate whether native vegetation could be established on disturbed areas.

During the following years, full-scale planting was implemented to reduce wind and water erosion through: the application of soil amendment with organic composts, slow-release fertilizer, and gypsum; contour strip planting of live shrubs inoculated with site-specific mycorrhizal inoculum; and grass/forb seed applied as a hydroseeded slurry. The work was conducted in three phases, with BNG conducting annual planting and monitoring of the previous year's efforts.

In June 1999, EPA's contractor, CH2M HILL, conducted a brief visual survey to determine the relative success, up to that point of time, of the revegetation efforts at the site. At the time of the survey, much of the vegetation from the three phases of planting was living and appeared to be potentially viable. Overall, each successive phase of planting appeared to be increasingly successful. This was possibly because the results of the previous year's planting demonstrated the more efficient plant species and soil amendments and provided data for BNG botanists.

14.2.7 Deviations from Approved Construction Documents

The following lists deviations that occurred during construction. The EPA and their representative from E&E were formally informed of the revisions during onsite meetings and monthly conference calls. Design modifications from approved construction documents were approved by EPA in their February 1, 1996 letter.

- Pond A outlet modifications included reducing the slope angle of the corrugated metal pipe (CMP) outlet to achieve a safer operating condition during construction.
- The access road north of Diversion Channel B at the inlet to the channel was excavated to an elevation of 4,166 feet instead of 4,170 feet to minimize ponding of water near the outlet of Pond G overflow pipe and dissipater pad.
- The sideslope angles of the Regional Sediment Storage Area were changed to avoid construction of sliver fills and to modify the existing slope at an isolated location to catch the tailings pile above the deviation which resulted in a slope of 2.8:1 (horizontal:vertical). The slope height at 2.8:1 is approximately 13 feet vertical, transitioning back to the designed slope of 3:1 for 40 feet horizontal both north and south of the erosion channel.
- The northeast leg of Diversion Channel A was shortened by approximately 30 feet to minimize destruction of existing vegetation that is currently stabilizing the slopes in this area against erosion.
- The sideslopes of Diversion Channel B in the areas determined to be rocky during excavation were changed to an angle of approximately 1:1 in order to minimize disturbance of existing dense and well-established vegetation.
- Loose rock on top of geotextile fabric was installed for the lowest 30 feet of Diversion Channel B due to water flowing from a local spring.
- Approximately 1,040 feet of gabions were installed as part of Diversion Channel B with a width of 18 feet instead of 21 feet due to the steep slope on the eastern side of the channel.
- The bottom of Pond C was not compacted due to water accumulation at the pond bottom from local seeps.
- The slope of the main berm of Pond C exceeds 2:1 due to water accumulation at the pond bottom from local seeps.
- Approximately 120 feet of the upper left fork of Diversion Channel A was constructed with 1-1/2-foot-depth gabions instead of two 9-inch-depth gabions.
- Polyfelt TS 500 geotextile fabric as used to complete construction of Diversion Channel A, the dissipater pads for Pond C and Pond E, and the Pond A access road crossing due to unavailability of the specified Mirafi 700X geotextile fabric.
- The 80-foot length of channel downstream of the Pond E overflow dissipater pad was constructed using geotextile fabric and loose rock instead of installing gabions. The channel is relatively flat, and standing water prevented the excavator from tracking down the channel to fill the gabions with rock.
- An access gate was not installed near the main road by Pond C because better access to Pond C may be obtained on the construction road located at the northeast corner of the pond.
- Treated Class 4 Douglas fir telephone poles were substituted for the staff gauges specified due to unavailability of material.
- Pond B and Pond C staff gauges were not installed at the locations shown on the Design Drawings due to inaccessibility from water accumulation in the ponds.
- Both layers of the double-chip seal road were constructed using 3/8-inch No. 6 washed rock due to unavailability of the rock specified.

- BLM gates originally located at Spanish Lake and at the lower entrance were relocated in accordance with the Design Drawings. Gates from Pond A and Pond B access roads were removed and reinstalled with new gate posts at the original locations.
- Improved drainage ditches near Pond A and Pond B entrance gates, along west side of main road, and east side of entrance to Pond E.
- Extended fence at north site access gate.

14.3 Operation and Maintenance

Since 1996, AMSC and BLM have conducted routine site inspections and operation and maintenance activities. Operation and maintenance activities are required to ensure the effectiveness of the engineering controls. An Operation and Maintenance Plan (O&M Plan) dated December 31, 1999 was developed for engineered systems at the site. BLM is the designated O&M manager for the site and has been administering the O&M Plan as outlined in the AMSC-BLM agreement. The regulatory agency responsible for oversight of the operation and maintenance work at the site is EPA.

The O&M Plan originally specified that routine inspections at the site of the engineering systems and access restrictions occur quarterly for the first 2 years, and then be conducted semi-annually for the remaining 28 years of the implementation period. However, in a letter dated January 2000, EPA approved reducing the frequency to annual inspections because of the nature of the site.

In addition to the frequency listed above, inspections shall be performed after storm events equal to or greater than 10-years. Should a seismic event greater than 4.8 on the Richter Scale occur within a 50-mile radius, a visual inspection shall be made within one week after the event. A maintenance report describing the results of the visual inspection shall be submitted to EPA, DTSC and AMSC within 5 working days of the inspection and shall include photographs of any significant damage. The maintenance report will include a repair plan and schedule for accomplishing the work and the inspection checklist.

The BLM will be the agency responsible for inspections due to storm events and/or seismic activity. The 10-year storm event to trigger an inspection will be based upon a rainfall depth of 2 inches or greater, within a 24-hour period measured at Spanish Lake Meteorological Station (Index No. 1864, Div. No. 05).

Routine maintenance is defined as the work effort required to maintain the intent and integrity of the engineered systems and appurtenances, and consistent with the general appearance and operation of the site at completion of the remedial action construction. These activities include (1) inspection of engineering systems to ensure integrity and performance, (2) removal of sediments from retention dams, (3) any repair work necessary to maintain the integrity of the remedial systems, (4) maintenance of the revegetated areas as appropriate, and (5) regular policing of the Atlas Mine Area by BLM rangers. Routine maintenance activities will be performed subsequently to the routine inspections and in accordance with the inspection reports, the Atlas Mine Area O&M Plan, and as directed by the BLM. It is not anticipated that routine maintenance activities will require the presence of an oversight engineer.

Emergency maintenance efforts may be required as the result of large storm events (equal to or greater than the 10 year 24 hour storm event) and/or significant seismic activity, which have caused damage to the engineered systems. Damage could include but is not limited to, overtopping of impoundments, severely eroded abutments or embankments, slope failure or cracks in the embankments, plugged or inoperative outlet works, impassable access, and overtopping and/or breech of diversion channels.

Only one noteworthy natural event has taken place since construction was completed. In the winter of

1998-1999, two 25-year storms occurred back to back. As a result, Pond C required sediment removal and Channel B required repairs (due to undercut riprap).

O&M inspections have been performed annually since June 2000 by ESC, contractor to BLM. The most recent routine O&M inspection was performed March 2001. No significant maintenance issues were noted at that time. It was noted that (anticipated) erosion and slumping were occurring. Some erosion has resulted in the partial failure of the entrance road to the Rover Pit, undercutting of Channel A, and erosion of a slope near the Regional Sediment Storage Area.

14.4 Access and Institutional Controls

Portions of the perimeter of the site have been fenced, and berms along White Creek road have been constructed by the BLM to discourage access of the Atlas Mine Area. The site is routinely inspected by BLM to discourage trespassing and to identify activities of vandalism. In addition, access to the site is further limited by two locked gates on White Creek Road above the site and two locked gates on the same road below the site. Signs are clearly posted and maintained by BLM The locks are managed by BLM.

A deed restriction that will limit use of the three privately held parcels of land has been negotiated but not recorded. When implemented it will help in preventing future disturbance of the contaminated material left at the site.

15.0 Progress Since the Last Five-Year Review for Atlas Mine Area OU

This is the first Five-Year Review performed for this OU.

16.0 Five-Year Review Process for the OU

Members of BLM and DTSC were notified of the initiation of the Five-Year Review in late-February 2001. The Five-Year Review team was led by Shea Jones of EPA, RPM for the Atlas Mine Area OU, and included members from the Regional Technical Advisory staff with expertise in biology and risk assessment. CH2M HILL was contracted by EPA to provide support for this review.

During July and September 2001, the review team established the review schedule whose components included:

- Community Notification
- Document Review
- Site Inspection
- Five-Year Review Report Development and Review

16.1 Community Notification

Based upon the current status at the Atlas Mine Area OU, community involvement will be limited to the production and distribution of a fact sheet summarizing the results of the Five-Year Review.

16.2 Document Review

This Five-Year Review consisted of a review of relevant documents (see Attachment 5). ARARs were also reviewed.

16.3 Site Inspection

Site inspections for the Five-Year Review were performed by EPA on March 12, 2001 and July 12, 2001. A representative of BLM accompanied EPA for each inspection. During the site inspections, the ponds, paved road, and diversion channels were noted to be in satisfactory condition. During the March 2001 inspection, it was noted that the road to the Rover Pit had partially deteriorated. During the July 2001 inspection, it was noted that the condition of the road to the Pond A area had also deteriorated; although it had not completely failed, its integrity was questionable at certain locations, especially at the point where a drainage pipe runs under the road. Erosion was also noted on the steep slope outbound of the Regional Sediment Storage Area and revegetation project. The slope extends down to a naturally vegetated area and creek. The erosion occurring of the slope is preferential, and a wedge-like void is growing toward the revegetation project and sediment storage area. The revegetation project results varied and growth was minimal at best. Photos from the site inspections can be found in Attachments 6 and 7.

17.0 Technical Assessment for the Atlas Mine Area OU

Question A: Is the remedy functioning as intended by the decision documents?

The site inspections and review of documents, ARARs, and risk assumptions indicate that the remedy is functioning as intended by the ROD. The remedial activities and subsequent monitoring have achieved the remedial objectives to reduce the exposure of asbestos.

Operation and maintenance of the Atlas Mine Area has, on the whole, been effective. The maintenance contractor regularly inspects the OU. Erosion and slides are occurring in areas where the structural controls have been installed to capture most of the soil and prevent it from migrating off the site. However, one erosion prone area located near the Regional Sediment Storage Area lies beyond the structural controls (see Attachment 7). This area also appears to have the potential for a wedge growth which, if it were to continue, could ultimately impact the revegetation area and sediment storage. Monitoring of this slope will be continued.

Erosion in the area above Pond B is threatening the integrity of the Pond A access road. During the July 12, 2001 site visit, it was noted that the road had partially eroded away at one point, and cracks in the unpaved road indicated that future slides were imminent. In order to continue down the road for the site inspection, inspectors had to leave their vehicle and continue on foot. If no measures are taken, the road will completely erode away and prevent access to parts of the site.

The Rover Pit access road has also partially failed; however, it is still possible for light vehicles to access the Rover Pit using this road. As such, no remedial measures are recommended for that road at this time.

The only major maintenance that has taken place has been the removal of sediment from Pond C and the repair of Channel B in 1999 following two 25-year storms.

The revegetation project was not very successful and suggests inadequate maintenance. Of the revegetation that has managed to survive, none are thriving.

O&M at this OU can be improved. Further nurturing of the revegetation, better upkeep of roads to repair and prevent deterioration, and carrying out investigations to reduce erosion may be required.

The fence around the site is intact and in good repair. It should be noted, however, that in past years, BLM has noted that the site has been accessed by unauthorized persons and vehicles. As such, they will continue to patrol the site.

While short-term institutional control needs (site access control) are in place, deed restrictions have not been placed on the property.

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?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

TABLE 9
Changes in Chemical-Specific Standards at the Atlas Mine Area OU

Contaminant	Media	Cleanup Level	Previous Standard/ Requirement	Citation/Year	New Standard/ Req't	Sig. of Changes
Asbestos	Air	N/A	Air cleaning - requires user of air cleaning devices for asbestos control to meet certain requirements	CAA, Asbestos NESHAP, 40 CFR 61.152: 1984 (amended 1986 and 1990)	None	None
Asbestos	Air	N/A	Reporting - requires asbestos waste producers subject to 40 CFR 61.149, 61.150, 61.151, and 61.154 to report certain information to EPA	CAA, Asbestos NESHAP, 40 CFR 61.153: 1984 (amended 1990 and 1991)	None	None
Asbestos	Air	N/A	Cross reference to other asbestos regulations	CAA, Asbestos NESHAP, 40 CFR 61.156: 1990 (amended 1995)	None	None
Asbestos	Air	N/A	PM10 Standard is ambient levels of particulate matter less than 10 microns shall not exceed 30 ug/m3 (annual average) or 50 ug/m3 (24 hour period)	California H&S Code, Div. 26, section 39000 et seq and CCR, Title 17, Part 3, Chapter 1, Subchapter 15, Article 2, Section 70200, Table of Standards (1989)]	No substantive changes Fresno County Air Pollution Control District (APCD) has been incorporated into San Joaquin Valley Unified APCD	None

CAA = Federal Clean Air Act

CCR = California Code of Regulations

CFR = Code of Federal Regulations

H&S Code = California Health and Safety Code

NESHAP = National Emissions Standard for Hazardous Air Pollutants

PM10 = Particulate Matter less than 10 microns in diameter

TABLE 10
Changes in Action-Specific Requirements at the Atlas Mine Area OU

Action	Previous Requirement	Citation/Year	New Requirement	Significance of Changes
Construction	Permissible exposure limit (PEL) of 0.2 asbestos fibers per cubic centimeter (f/cc) of air for occupationally exposed workers and action level of 0.1 f/cc as 8-hr time weighted average	OSHA, 51 FR 22612 (1986)	Amended to cover workers in additional labor classifications	None
Construction	All mining units shall be protected from flooding as shown on Table 1.2	CCR, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2572(b)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 7, Subchapter 1, Article 1, Section 22490(b)	None
Construction	Diversion and drainage facilities shall be designed and constructed to accommodate anticipated volume of precipitation and peak flow from surface runoff from 25-year, 24-hour storm	CCR, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2572(h)(1)(A)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 7, Subchapter 1, Article 1, Section 22490(h)(1)(A)	None
Construction	Dischargers shall comply with precipitation and drainage control requirements given in Section 20365(d) and (e)	CCR, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2572(h)(3)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 7, Subchapter 1, Article 1, Section 22490(h)(3)	None
Construction	Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system	CCR, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2546(d)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 3, Subchapter 2, Article 4, Section 20365(d)	None
Construction	Surface and subsurface drainage from outside WMU shall be diverted from unit	CCR, Title 23, Chapter 3, Subchapter 15, Article 7, Section 2546(e)	No substantive changes Recodified as CCR, Title 27, Div. 2, Chapter 3, Subchapter 2, Article 4, Section 20365(e)	None

CCR = California Code of Regulations

CFR = Code of Federal Regulations

FR = Federal Register

OSHA = Occupational Safety and Health Act

WMU = Waste Management Unit

TABLE 11
Changes in Location-Specific Requirements at the Atlas Mine Area OU

Location	Previous Requirement	Citation/Year	New Requirement	Significance of Changes
Atlas Mine Area OU	Activities carried out by Federal agencies should not jeopardize continued existence of endangered species identified at site or cause adverse modifications of critical habitat	16 U.S.C. 1536(a)(4) (1973)	None	None
Atlas Mine Area OU	Established guidelines for minimizing habitat loss	U.S. Fish and Wildlife Service Mitigation Policy – 46 FR 7644-7663, January 1981	None	None
Atlas Mine Area OU	Regulates discharge of dredged or fill material into navigable waters	FWPC, Section 404(b)(1), 33 U.S.C. 1344(b)	None	None
Atlas Mine Area OU	Regulates placement of deed restrictions on property so that site cannot be used for purpose other than existing industrial or manufacturing	California H&S Code; Div. 20, Chapter 6.5, Section 25220-25241 et seq [specifically, H&S Code section 25232(a)(1) and (2)] and CCR, Title 22, Div. 4, Chapter 30, Section 66001 et seq	None	None

CCR = California Code of Regulations
CFR = Code of Federal Regulations
FR = Federal Register
FWPCA = Federal Water Pollution Control Act
H&S Code = California Health and Safety Code
USC = United States Code

No significant revisions to the standards have been made that affect the protectiveness of the remedy.

No new standards have been promulgated that affect the protectiveness of the remedy.

No significant revisions have been made to TBCs that affect the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

An ecological risk assessment was considered for the Atlas Mine Area OU. Upon review of the RI, it was noted that "from an ecological standpoint, the most significant impacts of the site appeared to be associated with habitat destruction [from mining activities], rather than the effects of asbestos." Because of the lack of changes in land use, an ecological risk assessment was deemed unnecessary. In addition, an Environmental Impact Statement was issued for the CCMA in 1995 when BLM was evaluating land use alternatives. As previously mentioned, the Atlas Mine Area OU is part of the CCMA, and this Environmental Impact Statement was reviewed in lieu of performing an ecological risk assessment. This review did not reveal any information that calls into question the protectiveness of the remedy.

No weather- or seismic-related events have affected the protectiveness of the remedy. There is erosion in two areas that need to be investigated and addressed (the road near Pond A and a slope near the Regional Sediment Storage Area). No other information that calls into question the protectiveness of the remedy has been discovered.

17.1 Technical Assessment Summary

According to the documents and data reviewed, the remedy is functioning as intended by the ROD (with the exception of two erosion problems). There have been no changes in the standards that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

18.0 Issues for the Atlas Mine Area OU

TABLE 12
Issue for the Atlas Mine Area OU

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Access road to Pond A Area failing	N	Y
Erosion prone area near Regional Sediment Storage Area	N	Y
Revegetation sites	N	N
Institutional Controls	N	Y

Although addressing the erosion prone area near the Regional Sediment Storage Area may not be considered a remedial action, it may be considered a property management issue. EPA will issue a letter to BLM, notifying them of this site condition and recommending that they take actions to mitigate the erosion in that area.

In addition, prior to delisting the site, EPA will clarify the link between the Atlas Mine Area OU and lands that are part of the CCMA and Arroyo Pasajero. EPA will continue to oversee O&M activities at the site.

19.0 0 Recommendations and Follow-up Actions for the Atlas Mine Area OU

TABLE 13
Recommendation and Follow-up Actions for the Atlas Mine Area OU

Issues	Recommendations & Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Access road to Pond A area is failing	Repair road or find another route to access Pond A area.	BLM	EPA	July 2002	N	Y
Erosion prone area near the Regional Sediment Storage Area	Preform a study to determine the best means of addressing eroding soil	BLM	EPA	September 2002	N	Y
Revegetation sites	Better and more frequent maintenance	BLM	EPA	September 2002	N	N
Institutional Controls	Place deed restrictions on property; access control agreement	EPA	EPA	September 2002	N	Y

20.0 Protectiveness Statement for the Atlas Mine Area OU

The remedy at the Atlas Mine Area OU is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. All immediate threats at the site have been addressed through the removal of contaminated material, stabilization of erosion prone areas, structural improvements and additions, the installation of access controls and warning signs and regular maintenance of the Atlas Mine Area OU. Additional institutional controls including property deed restrictions and agreements for land access control need to be implemented to ensure long-term protectiveness.

21.0 Next Review for the Atlas Mine Area OU

The next Five-Year Review for the Atlas Asbestos Mine Superfund Site is required by September 2006, five years from the date of this review.