Libby Asbestos Superfund Site OU2 – Former Screening Plant

U.S. EPA, Region 8 – Denver, Colorado *September 2009*

Proposed Plan for Public Comment

Introduction

The public is invited to review and comment on this Proposed Plan to address environmental cleanup at **Operable Unit 2** (**OU2**) of the Libby Asbestos **Superfund** Site in Libby, Montana. OU2 is the former Screening Plant and is located on the banks of the Kootenai River about five miles northeast of Libby, Montana. OU2 is one of eight **OUs** at the site (Exhibit 1). The investigation and cleanup are being done by the U.S. Environmental Protection Agency (EPA), in consultation with the Montana Department of Environmental Quality (DEQ) under the **Superfund** law. This Proposed Plan provides an overview of the site history, site contamination, and risk; summarizes the remedial alternatives EPA is considering; and details EPA's preferred remedial alternative and supporting rationale.

Exhibit 1. Libby Asbestos **Superfund** Site OUs

OU#	Name
1	Former Export Plant
2	Former Screening Plant and nearby areas
3	Former Vermiculite Mine
4	Libby, MT (Residential, commercial, industrial, and public properties)
5	Former Stimson Lumber parcel
6	Burlington Northern and Santa Fe Railroad
7	Troy, MT
8	State Highways

Issuance of this plan starts the public comment period (September 16 to October 16 2009). At the end of that period, EPA will review and consider all comments provided. Based on that consideration, EPA may select the preferred cleanup alternative, modify it, select another response action, or develop other alternatives if public comment warrants or if new material is presented.

Information on how to provide your comments or questions to EPA is provided on page 12, along with details on where you can get more information and attend a public meeting. To help you better understand the plan, page 13 provides a list of commonly used environmental terms that appear in **BOLD** thought this Proposed Plan.

This Proposed Plan focuses on OU2. For additional information on the Libby Asbestos Site as a whole, please contact the EPA Information Center in Libby or visit EPA's web site (page 12).

Understanding the Superfund Process

Issuance of the Proposed Plan is part of a detailed process that includes everything from site discovery through cleanup (Exhibit 2). EPA will continue to work with local residents on this process over the coming months.

The **remedial investigation (RI)** and **feasibility study (FS)** for OU2 were completed in July and August 2009 using the data collected since 1999. These documents are conducted concurrently, as data collected in the **RI** influence development of remedial alternatives in the **FS**. The **RI** characterizes the site conditions, determines the nature of the waste, and assesses risk to human health and the environment. The **FS** identifies, develops, screens, and evaluates remedial alternatives to address risks to human health and the environment from soil contaminated with **Libby Amphibole** (**LA**) **asbestos**.

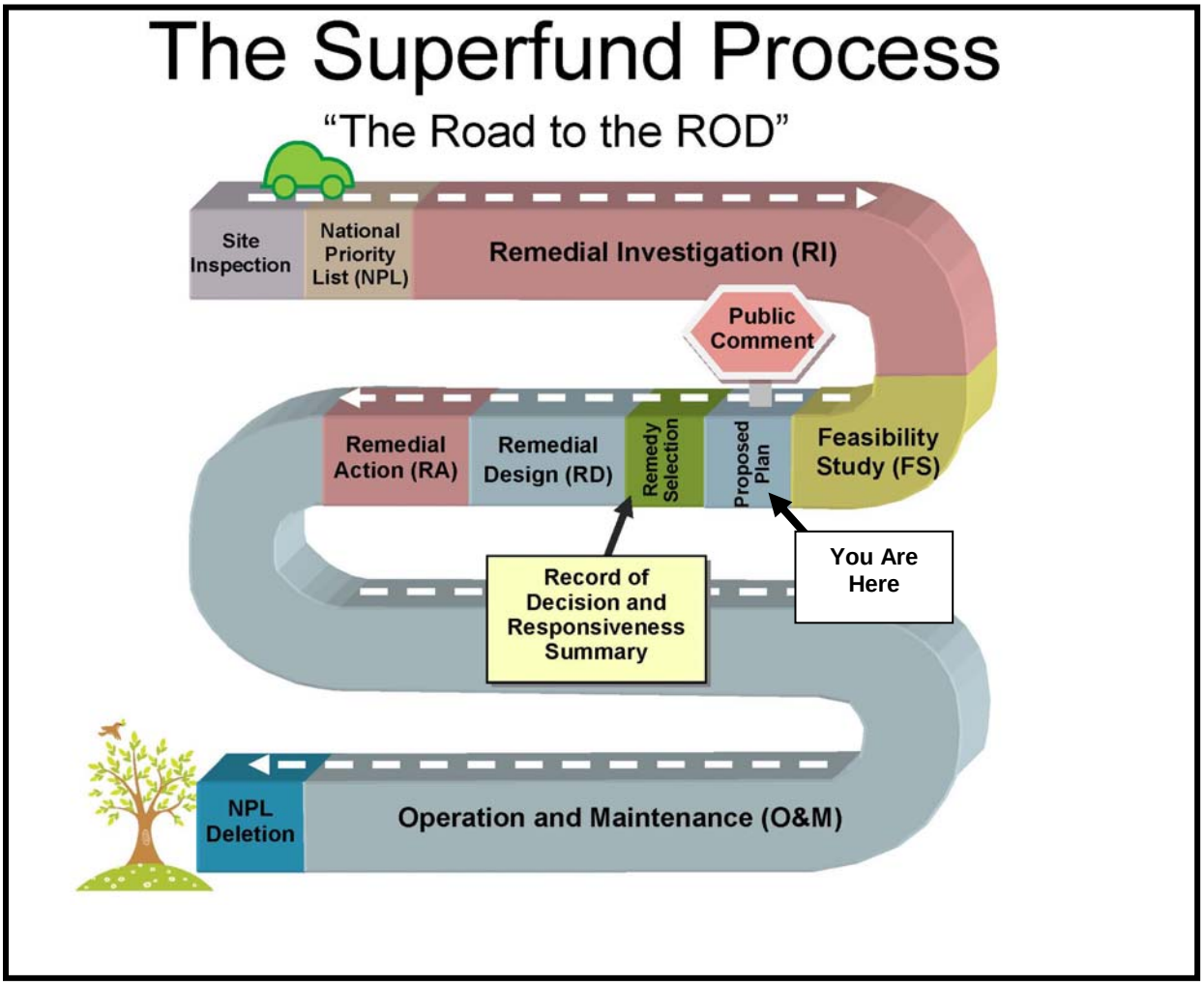
The general **FS** process follows the steps summarized in the following bullets:

- Identify **remedial action objectives** (**RAOs**)
- Identify and screen potential remedial technologies that will satisfy these **RAOs**
- Assemble remedial alternatives that can provide protection of human health and the environment from the retained remedial technologies
- Screen the alternatives based on effectiveness, implementability, and cost
- For alternatives that make it through the screening process, conduct a detailed analysis against seven of nine evaluation criteria (the two threshold criteria and the five primary balancing criteria) and a comparison between alternatives

After the **FS** is finalized, a preferred alternative for the site is presented to the public in a Proposed Plan (this document). The Proposed Plan briefly summarizes the alternatives studied in the detailed analysis phase of the **RI/FS** and, highlights the key factors that led to identifying the preferred alternative. The public comment period allows the State of Montana (through DEQ) and the community to provide comment on the preferred alternative.

The final phase of the **RI/FS** process is to prepare a **Record of Decision** (**ROD**). Following the receipt and evaluation of public comments and any final comments from DEQ, EPA selects and documents the remedy for the site in a **ROD**.

Exhibit 2. The **Superfund** Process



Site Characteristics

OU2 is mostly undeveloped and contains only two buildings. With the exception of the riverbank, the majority of the Former Screening Plant and Flyway properties are fenced to prevent access from Highway 37 and the *River Runs through It* subdivision (south of the **OU**).

OU2 is divided into four subareas:

- **Subarea 1 – Former Screening Plant.** This 21-acre subarea has a privately owned garage/shed/apartment that is accessed periodically by the owners. This property is used for residential purposes, and it is anticipated that future use will continue to be residential and/or commercial. Rip-rap was also placed along the river banks in this subarea to protect against flooding and bank erosion. Due to the **LA** contamination associated with vermiculite from the Libby Mine, the subarea has undergone extensive investigation and removals since 1999, when EPA began emergency response activities in Libby.

- **Subarea 2 – Flyway.** This 19-acre subarea (currently owned by a subsidiary of Grace) housed a pump that conveyed water from the Kootenai River to the mine during mining operations. The pump house has been abandoned and cleaned, and the structure was left on-site for possible future use. The subarea includes the adjacent Highway 37 right-of-way. The subarea is currently vacant, undeveloped land, and there are no plans for development. Portions of the subarea have shore line that could be accessible by boat. This subarea was found to contain several vermiculite piles and vermiculite-containing material was also used as fill. The majority of the subarea was remediated between 2001 and 2005 by EPA and Grace.

- **Subarea 3 - Private Property.** This 1-acre parcel includes the Highway 37 right-of-way adjacent to it. The property is currently vacant, undeveloped land, and there are currently no plans for development. In the past, the property was used for mining related activities such as decontamination, storage, and staging area. The subarea was remediated in 2005 by EPA.

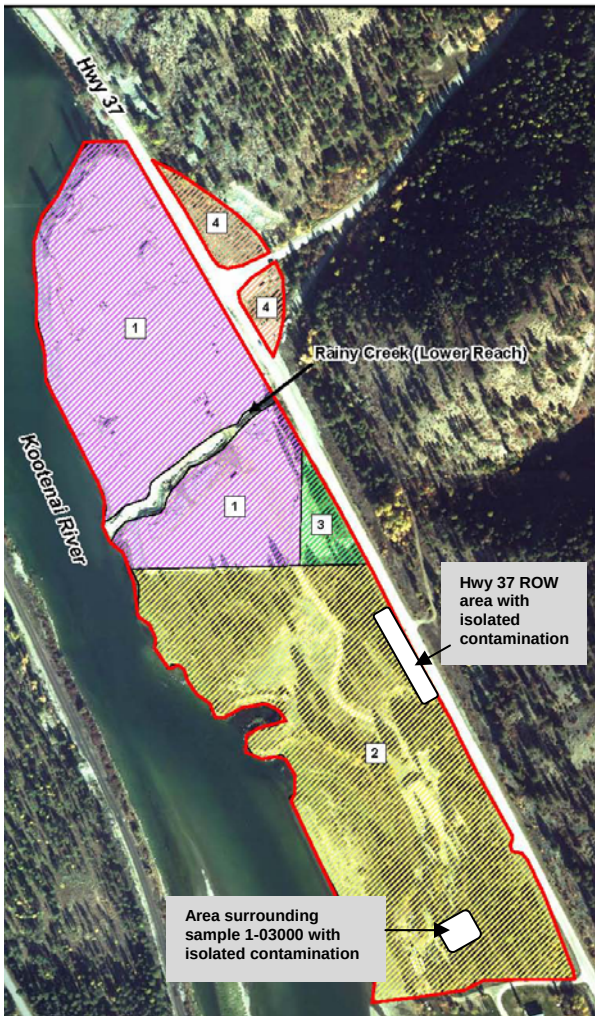


Exhibit 3. Locations of Subareas in OU2

- **Subarea 4 - Rainey Creek Road Frontage.** This 45,000 square foot subarea is privately owned and was used to store trees for use during restoration at the former Screening Plant. It is currently vacant, undeveloped land, and it is expected to remain undeveloped. The subarea was remediated by EPA between 2004 and 2006.

Rainey Creek flows through Subarea 1. It is a perennial stream that discharges to the Kootenai River. The lower reach of Rainey Creek that flows through OU2 is owned by the State of Montana. However, the adjacent riparian lands are privately owned. This reach was restored with several step pools to facilitate fish migration. It is expected that Rainey Creek will continue to sustain a viable fish population;

however, it is unknown whether public access to the lower reach will be allowed in the future.

Site Background

Contamination at OU2 is primarily linked to operations at the nearby vermiculite mine, most recently owned and operated by the W. R. Grace Company (Grace). **LA** is a naturally occurring contaminant in the vermiculite deposits at the mine. Ore was transported from the mine to the former Screening Plant and then to local and nationwide processing facilities. The ore was processed by heat expansion and was then exported to market via truck or rail.

Historic uses of these four subareas are:

- **Subarea 1.** Grace used the former Screening Plant from 1975 to 1990 to screen mined vermiculite by size and grade. The ore was sorted, stored, and loaded onto a conveyor for transport across the Kootenai River. It was then trucked to the local Export Plant (OU1) for processing or transported by rail to expansion plants outside of Libby. From 1993 to 1999, it operated as Raintree Nursery.
- **Subarea 2.** The Flyway is currently owned by Kootenai Development Corporation (a Grace subsidiary). In 1999, it was found to contain vermiculite piles, and vermiculite-containing fill was also suspected to have been used to level drainages.
- **Subarea 3**. The Private Property was likely used by Grace for vermiculite mining-related activities (e.g., storage or equipment staging). More recently, it was used for equipment decontamination during remediation of Areas 1 and 2.
- **Subarea 4.** The Rainey Creek Road frontage areas were used for a short period to store trees for use in restoration of Subarea 1.

In November 1999, in cooperation with the Agency for Toxic Substances and Disease Registry and DEQ, EPA began an emergency response action to protect public health. The Libby Asbestos Site was subsequently listed on the **NPL** in October 2002. Due to **LA** contamination associated with vermiculite from the Libby mine, OU2 has undergone extensive investigation and response actions under EPA's emergency response authorities.

The investigations conducted at OU2 since 1999 to determine the nature and extent of **LA** contamination have included sampling of soil, dust, air, and bulk materials, as well as activity-based sampling. They are detailed in the **RI** and are briefly summarized in Exhibit 4.

Exhibit 4 – Summary of Investigations at OU2

Year	Event	Summary
Screening Plant (Subarea 1)		
1999, Dec	Soil sampling	Baseline evaluation of **LA** soil contamination on-site.
2000, March/ Aug	Soil, dust, and scenario-based personal air sampling	Soil sampling to supplement 1999 investigation. Dust sampling to determine if contamination was present. Scenario-based sampling to determine concentrations of **LA** from building maintenance activities.
2001, April - May	Soil sampling	Soil sample event to supplement the 1999 investigation and better characterize site soils.
2003, March	Soil and bulk material sampling	Sampling to determine if soil contained in the root mass of trees removed from the **OU** was contaminated with **LA**.
Flyway (Subarea 2)		
2000, March	Soil sampling	Baseline evaluation of **LA** soil contamination on-site.
2000, Sept		Sampling from test pits to document possible **exposure** during an archaeological investigation.
2001, March		Trenching to determine vertical extent of **LA** contamination in soil not previously investigated.
2001, May and July		Soil sample event to supplement the 2000 investigation and better characterize site soils.
2003, July		Sampling to supplement 2000 investigation, including portions of the Highway 37 right-of-way.
2005, June		Soil sampling activities to determine the extent of soil requiring removal along the Highway 37 right-of-way.
2007, Aug 2008, June	Ambient air sampling	Outdoor ambient air samples collected
Private Property (Subarea 3)		
2000, April	Soil sampling	Sampling of vermiculite stockpiles and soil areas.
Rainey Creek Road Frontage (Subarea 4)		
2003, May	Soil sampling	Baseline evaluation of **LA** soil contamination.
2003, Nov	Soil sampling	Confirmation samples of decontamination run-off water.

In addition to the investigations, a variety of past response actions have been performed at OU2. These include the removal of vermiculite contaminated dust, soil, and debris. These actions

Exhibit 5 – Summary of Past Response Actions at OU2

Year	Material Removed	Summary of Response Actions
Former Screening Plant (Subarea 1)		
2000, August through October	Building demolition materials, vermiculite contaminated soil, and debris	Demolition of all buildings except the long shed. Removal of miscellaneous metal debris, vegetative covering, and excavation of contaminated soil. All debris and soil was stockpiled for future disposal at the Former Libby Vermiculite Mine.
2001, August through November	Building demolition materials, vermiculite contaminated soil, and debris	Demolition of the long shed. Continued excavation and disposal of contaminated soil at the Former Libby Vermiculite Mine.
2002, August through October	Vermiculite contaminated soil, debris, trees, and vegetative material	Removal of decontamination pad and surrounding soil. Excavation along the banks of Rainey Creek, including removal of trees and vegetation and disposal of contaminated soil at the Former Libby Vermiculite Mine.
2002, October 2003, April	Vermiculite contaminated soil, granular pad	Removal of vermiculite contaminated soil and granular pad during installation of potable water well.
2003, September 2004, August	Vermiculite contaminated soil	Excavation within the Highway 37 right-of-way and disposal of contaminated soil at the Former Libby Vermiculite Mine.
2005, July 2006, May	Vermiculite contaminated soil	Removal of vermiculite contaminated soil and granular pad during installation of potable water well.
Flyway (Subarea 2)		
2001, September	Vermiculite contaminated soil	Excavation and disposal of vermiculite contaminated soil at the Former Libby Vermiculite Mine site.
2004, July through November	Vermiculite contaminated soil	Continued excavation and disposal of vermiculite contaminated soil at the Former Libby Vermiculite Mine.
2005, June	Vermiculite contaminated soil	Excavation within the Highway 37 right-of-way adjacent to the Flyway and disposal of contaminated soil at the Former Libby Vermiculite Mine.
Private Property (Subarea 3)		
2005, June	Vermiculite contaminated soil	Excavation in conjunction with removal activities along Hwy 37 right-of-way and disposal of contaminated soil at the Former Libby Vermiculite Mine.
Rainey Creek Road Frontage (Subarea 4)		
2004, August through October	Vermiculite contaminated soil	Excavation along the North and South frontages and disposal of vermiculite contaminated soil at the Former Libby Vermiculite Mine site.
2006, August	Vermiculite contaminated soil, repairs to damaged water line	Excavation to locate and repair a damaged water line and disposal of vermiculite contaminated soil at the Former Libby Vermiculite Mine site.

were taken to reduce the volume of **LA** and reduce further **exposure** to source material. Response activities completed between 2000 and 2006 are summarized in Exhibit 5.

Nature and Extent of Contamination

The **RI** summarizes the nature and extent of contamination. Over the years, **LA** has been observed in all the media sampled (indoor air, indoor dust, outdoor ambient air, outdoor air near disturbed soil, and soil). However, all complete **exposure pathways** have either been broken through past response actions or investigation has found them to be below levels of concern. The possible exception is outdoor air near disturbed soil in an isolated portion of the Highway 37 right-of-way and the area surrounding sample location 1-03000. Both of these locations are within the Flyway (Subarea 2).

In summary:

- There is an isolated area with concentrations of **LA** of greater than 1 percent at less than 1

foot within the Flyway portion of the Highway 37 right-of-way.

- There is an area surrounding sample location 1-03000 with concentrations of **LA** at less than 1 percent within the Flyway.

- Ambient air concentrations indicate an acceptable risk range of between 5E-08 and 1E-07. For the layman, a risk of 5E-08 means that, over a lifetime, the contamination is expected to have a risk of 5 additional cancer deaths per 100 million people.
- There is vermiculite-containing soil in the subsurface below engineered caps.
- The majority of residual contamination is present at depths greater than or equal to 4 feet. In several isolated areas in Subarea 1, it is present at depths less than 4 feet.
- The majority of the excavated areas in Subarea 2 met EPA's clearance criteria (less than 1 percent **LA** at depth) at depths varying from less than 1 foot to greater than 4 feet. However, **LA** concentrations greater than 1 percent have been detected in confirmation soil samples from the eastern boundary of the Flyway within the Highway 37 right-of-way at depths less than 1 foot up to 2 feet. **LA** was also seen in surface soil in one other location (surrounding sample 1-03000, which was not previously remediated) at concentrations less than 1 percent.
- The majority of Subarea 3 does not contain residual contamination; however, one confirmation soil sample collected along the north portion of the property contained less than 1 percent **LA** at a depth of 1 foot.
- Residual contamination is present along the Rainey Creek Road Frontages at depths of between 1 and 2 feet.

Conceptual Site Model

The conceptual site model (CSM) is a basic description of how contaminants enter the environment, how they are transported, and what routes of **exposure** to organisms and humans occur. It also provides a framework for assessing risks from contaminants, developing remedial strategies, determining source control requirements, and methods to address unacceptable risks. **LA** is the dominant environmental concern at the site. The CSM for OU2 includes current and future receptors and is depicted pictorially in Exhibit 6 (next page).

Sources of Vermiculite

Vermiculite and/or vermiculite concentrate was transported to OU2 from the mine for screening prior to shipment to the various export plants. It is also believed that vermiculite materials were used to fill in low lying areas of the site. Potential contaminated media of concern evaluated for OU2 include: outdoor air near highways, indoor air, dust in air of vehicles, outdoor air near disturbed soil, general (ambient) outdoor air, and dust in air from disturbance of outdoor surfaces.

Exposure Pathways

Current potential human receptors at OU2 include commercial workers, tradespersons, recreational visitors, and future residents. The **exposure** route of chief concern for these receptors is inhalation (breathing) of **LA** fibers in air. The original CSM was prepared before the past response actions and additional sampling had been conducted. It predicted that people at OU2 may have been exposed to **LA** in air via four main **exposure pathways**:

- Inhalation of fibers released during activities that disturb soil
- Inhalation of fibers in indoor air
- Inhalation of fibers in outdoor (ambient) air
- Inhalation of fibers from dust on Highway 37

A summary of results of past response actions and additional monitoring on **exposure pathway**s at OU2 is shown below and in Exhibit 6.

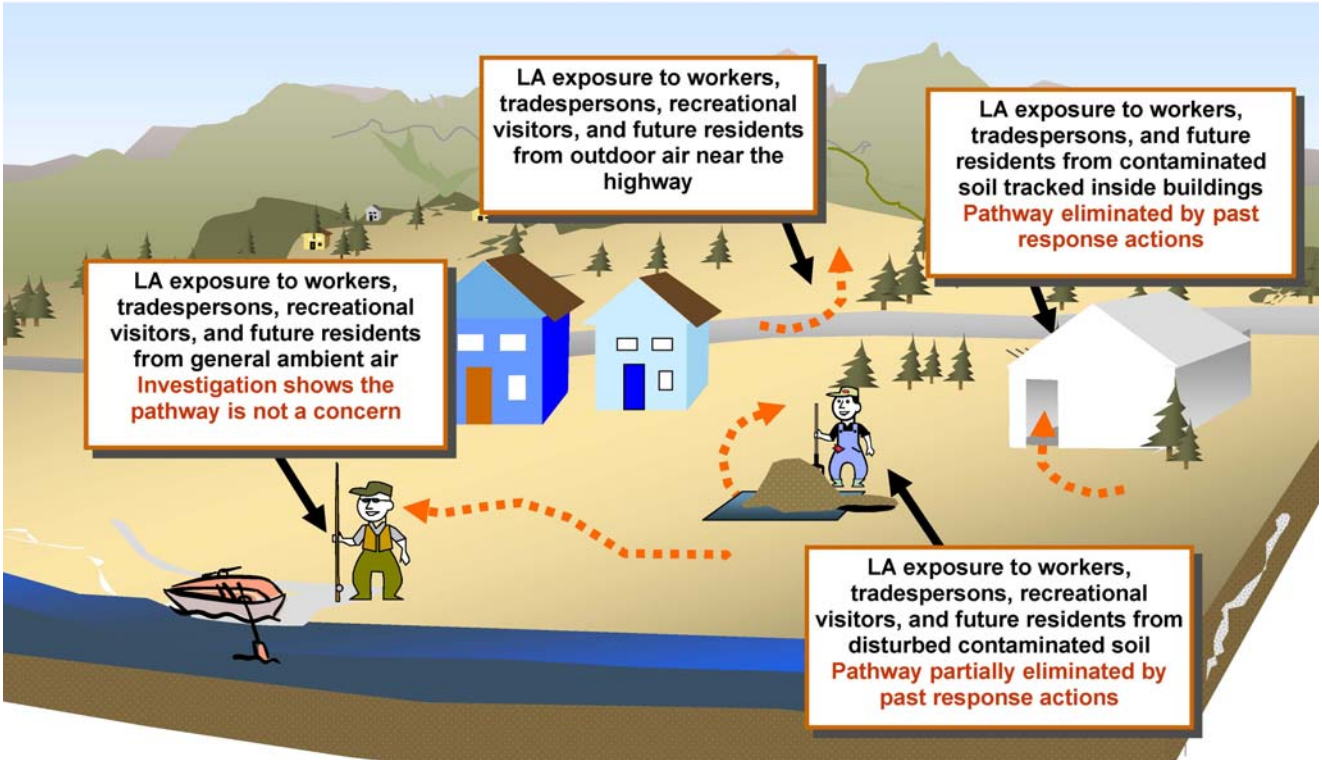
- **Disturbance of Soil**. The potential **exposure** resulting from active soil disturbance is believed to be the most significant pathway. However, the majority of **LA** contamination in soil is present at depths between 1 to 4 feet and is below an engineered cover. The two exceptions are: the area around sample location 1-03000 where surface soil has not been remediated and an isolated portion of the Highway 37 right-of-way where **LA** was found at concentrations greater than 1 percent at less than 1 foot.

- **Indoor Air.** The potential **exposure** resulting from inhalation of **LA** fibers in indoor air has been eliminated through a response action that cleaned the interior of the buildings.
- **Outdoor (Ambient) Air.** Investigation results indicate this pathway is no longer a concern.

at **Superfund** sites, including recent guidance that has been specifically developed to support evaluations of **exposure** and risk from asbestos.

Detailed explanations of the steps used to conduct the risk assessment are provided in the **RI** report, including background information on asbestos, the basis for concern, the **exposure** model, a toxicity assessment, quantification of **exposure** and risk, and a listing of uncertainties.

Exhibit 6. Summary of Current Status of Exposure Pathways after Past Response Actions



- **Dust on Highway 37.** This pathway has been largely eliminated through the response actions. The exception is an isolated portion of shallow contaminated soil on the Highway 37 right-of-way, adjacent to the Flyway (approximately 2,000 feet north of the highway turn off to the Flyway gate).

Summary of Site Risks

The **RI** report contains a baseline human health risk assessment for OU2. The risk assessment uses available data to estimate the health risks to people who may breathe asbestos in air while working in or visiting OU2, either now or in the future, based on current conditions. Methods used to evaluate human health risk are in basic accord with EPA guidelines for evaluating risks

This Proposed Plan provides a brief summary of the conclusions of the risk assessment. Methods for quantification of cancer and non-cancer risk from inhalation **exposure** to asbestos are still under development. However, risk predictions based on the best methods and data currently available indicate the following:

- Results of a 2-year study on ambient air concentrations in and around Libby indicate that lifetime excess cancer risks to area residents and workers from **LA** were below EPA's level of concern (less than one in one million [<1E-06]).
- Most surface soils in OU2 have been remediated, and there are no complete **exposure pathway**s of concern at present in those areas.

- Two locations remain in the Flyway subarea where surface soil is known to be contaminated (west embankments of Highway 37 and the area surrounding sample location 1-03000). Also, residual vermiculite and **LA** remain in subsurface soil in many locations. If contaminated subsurface soil were brought to the surface, human **exposure** could become a concern at many locations across the **OU**.
- No data exist to support a quantitative evaluation of potential risks to humans who might disturb contaminated surface soil. However, air sampling data (prior to and during cleanup) at the site indicate that human health risks might be unacceptable if contamination in soil became sufficiently extensive and human **exposure** was chronic.

EPA is working to develop a reference concentration that will allow non-cancer **exposure** risk for inhalation **exposure** to **LA** to be quantified. Therefore, the risk assessment does not include an evaluation of non-cancer risk. However, studies in Libby reveal that the incidence of asbestos-related, non-cancer effects (e.g., pleural calcification, pleural thickening and opacities) is increased in workers and residents. These findings emphasize that, despite the present inability to provide a quantitative calculation, non-cancer effects are a significant human health concern in the community. Thus, it should not be presumed that cancer risk is the "risk driver" at OU2 or other parts of the site.

Ecological risk has not yet been addressed for OU2. EPA will be conducting a comprehensive assessment of ecological risks as part of the OU3 work (the mine site) that will address ecological risk for OU2.

Remedial Action Objectives

Remedial Action Objectives (**RAOs**) are goals developed by EPA to protect human health and the environment at the Libby Asbestos Site. These are the overarching goals that all cleanup activities selected for OU2 should strive to meet (Exhibit 7). EPA considers current and future use of the site when determining RAOs.

Within OU2, Subareas 2, 3, and 4 are currently undeveloped with no plans for future development. Subarea 1 is being used as residential property. Future land use for the entire OU2 is assumed to be residential and/or commercial.

In evaluating potential future activities at the site, the final condition of the remediated area must be considered. For each of the alternatives evaluated, **institutional controls (ICs)** and **engineered controls** would be implemented to provide continued protection to human health and the environment. **ICs** are actions, such as restrictive covenants, zoning ordinances, easements, deed restrictions, and building permits, that help minimize the potential for human **exposure** to contamination by ensuring appropriate land or resource use. **Engineered controls** are physical controls, such as fencing and signs. Both types of controls are used to help preserve the integrity of the remedy.

Exhibit 7. RAOs for OU2

RAOs for OU2

1. Mitigate the potential for inhalation exposures to asbestos fibers that would result in risks that exceed the target cancer risk range specified by EPA of 1E-06 to 1E-04 (one in one million to one in ten thousand).
2. Control erosion of contaminated soil by wind and water from source locations to prevent the spread of contamination to unimpacted locations and media.
3. Implement controls to prevent site uses that could pose unacceptable risks to human health or the environment or compromise the remedy.

EPA's goal is to protect public health or welfare or the environment from **exposure** to **LA** in a way that is consistent with the intended use of the property. EPA will perform cleanup to provide protection to the public and the environment, but will not otherwise create improvements to the property. The **RAOs** for OU2 are based on anticipated future use.

Summary of Remedial Action Alternatives

A number of proven, remedial technologies and process options were used to develop remedial

Exhibit 8. Remedy Components Used in Site Remedial Alternatives

Remedy Component Used	Remedial Alternative					
	1	2	3a	3b	4	5
In-Place Containment of Contaminated Soil			●	●		
Removal of Contaminated Soil				●	●	●
Offsite Disposal at the Former Libby Vermiculite Mine				●	●	
Offsite Thermo-Chemical Treatment and Reuse of Treated Material						●
ICs and **Engineered Controls** with Monitoring		●	●	●	●	●
5-year Review	●	●	●	●	●	●

The shaded alternatives were eliminated from consideration prior to detailed analysis

alternatives for cleanup. The five remedial alternatives that were screened during the **FS** consisted of varying combinations of those technologies and process options (Exhibit 8). As can be seen from the exhibit, the main differences between alternatives relate to the following:

- Is contaminated surface soil across the **OU** left alone (Alternative 2), capped in place (Alternatives 3a and 3b), or removed (Alternatives 3b, 4, and 5)?

- Is removed soil disposed at the former mine (Alternatives 3b and 4) or is the soil treated and returned to the site (Alternative 5)?

Each of the five alternatives was evaluated in the **FS** to determine its ability to provide protection to human health and the environment through overall effectiveness, implementability, and cost. Alternatives deemed to have lower than moderate effectiveness or implementability and/or high cost were eliminated from further consideration. Alternative 4 was eliminated on the basis of implementability as removal of contaminated soil from highway embankments might jeopardize pavement stability and cause significant disruption of the highway. Alternative 5 was eliminated for the above reason and because of issues related to the availability of the technology and applicability to this medium. Further information on those determinations can be found in the **FS**.

Four remedial alternatives were retained for detailed analysis and are discussed below. Their costs are presented for purposes of comparing one alternative to another and are not developed with the level of detail necessary to be estimated completion costs. Typically, costs developed for **FS** purposes are as much as 30 percent lower to 50 percent higher than actual completion costs.

ICs would be used for all alternatives except Alternative 1. Specific **ICs** would be chosen in the remedial design phase in consultations with EPA, Montana DEQ, and the property owner(s).

Alternative 1

- **No Action**

Est. Total Capital Costs: None
Est. Total Five-year Review Costs (first 30 years): $288,000
Est. Construction Timeframe: None
Est. Total Alternative Cost (Present Value [PV]): $104,000

Superfund requires that EPA retain a no-action alternative as a baseline for comparison to other alternatives. This alternative would require that current site operations be suspended. The only actions that would be implemented for Alternative 1 are completion of five-year site reviews and monitoring (e.g., non-intrusive visual inspections) needed to support conclusions made in the reviews. Non-intrusive visual surface inspections performed in support of **five-year reviews** would be made on the entire **OU**. Alternative 1 is not protective of human health or the environment and does not comply with **RAOs**.

Alternative 2

- **ICs and Engineered Controls w/Monitoring**

Est. Total Capital Costs: $261,000
Est. Total Operations and Maintenance (O&M) and Five-Year Site Review (first 30 years): $984,000
Est. Construction Timeframe: less than one construction season (May-Oct)
Est. Total Alternative Cost (PV): $623,000

Alternative 2 provides protection of human health through **ICs** (administrative controls) coupled with **engineered controls** (physical

controls) to restrict access and use of areas containing contaminated soil, including subsurface soils covered under previous response actions. Monitoring would be used to ensure these controls are protective.

ICs would help ensure remedy effectiveness and could consist of a combination of governmental, proprietary, legal, or information devices. A comprehensive **ICs** plan would be required. **Engineered controls** (e.g., chain-link fencing and warning signs) would prevent access to seasonally flooded areas in the Flyway where the presence or absence of **LA** is unknown. Long-term **O&M** would maintain the integrity of **engineered controls** and effectiveness of **ICs**.

Alternative 3a

- **In-Place Containment of Contaminated Soil in the Flyway Subarea (Highway 37 Embankments and Soil Surrounding Sample Location 1-03000)**
- **ICs and Engineered Controls w/Monitoring**

Est. Total Capital Costs: $323,000
Est. Total O&M and 5-Year Review Costs (first 30 years): $984,000
Est. Construction Timeframe: less than one construction season (May to October)
Est. Total Alternative Cost (PV): $681,000

Alternative 3a provides protection of human health through in-place containment (protective covers) to address risks to human receptors from contaminated soil within two isolated locations of the Flyway subarea. These two locations include the west embankment of Highway 37 and the area surrounding sample location 1-03000. The contaminated surface soil in these two isolated locations would be covered with 12 inches of clean soil cover and 6 inches of topsoil. Clean soil would be brought in from a source outside of the valley. Water or chemicals would be used during construction to prevent asbestos fibers from becoming airborne.

Covers would be seeded to minimize erosion. Long-term **O&M** would be required to maintain the integrity of the **engineered controls** and covers, including covers placed during previous response actions and as part of this alternative.

ICs and engineered controls would be used as described under Alternative 2. Inspections and **five-year reviews** would be performed, and monitoring would continue to evaluate protectiveness of the remedy.

Alternative 3b

- **In-Place Containment of Contaminated Soil in the Flyway Subarea (Highway 37 Embankments)**
- **Removal of Contaminated Soil within Flyway Subarea (Soil Surrounding Sample Location 1-03000)**
- **Offsite Disposal of Removed Soil at the Former Libby Vermiculite Mine**
- **ICs and Engineered Controls w/Monitoring**

Est. Total Capital Costs: $338,000
Est. Total O&M and 5-Year Review Costs (first 30 years): $984,000
Est. Construction Timeframe: less than one construction season (May-Oct)
Est. Total Alternative Cost (PV): $695,000

Alternative 3b provides protection of human health through in-place containment (protective covers) as well as removal and offsite disposal to address risks to human receptors from contaminated soil within two isolated locations of the Flyway. These two locations include the west embankment of Highway 37 and the area surrounding sample location 1-03000. The location within the west embankment of Highway 37 would be contained in-place using protective covers and the location surrounding sample location 1-03000 would be excavated along with offsite disposal of contaminated soil. The contaminated surface soil in the west embankment of Highway 37 would be covered as discussed for Alternative 3a.

Limited removal (excavation) of contaminated soil within the area surrounding sample 1-03000 would be conducted to an assumed depth of 12 inches and to then backfilled using clean soil. Specialized trucks (with covered tops) would be used to transport removed contaminated soil to the Former Libby Vermiculite Mine. This mine is been currently used for disposal of contaminated soil generated during ongoing cleanup activities performed in other **OUs** within the Libby Asbestos **Superfund** Site. Water or chemicals would be used during removal and construction of the covers and **engineered controls** to prevent asbestos fibers from becoming airborne.

Covers would be seeded to minimize erosion. Long-term **O&M** would be required to maintain

the integrity of the **engineered controls**, backfilled areas, and covers, including covers placed during previous response actions and as part of this alternative.

ICs and engineered controls would be used as described under Alternative 2. Inspections and **five-year reviews** would be performed. Monitoring would continue to evaluate protectiveness of the remedy.

Evaluation of Remedial Alternatives

The alternatives that survived the initial screening process (Alternatives 1, 2, 3a, and 3b) were evaluated in detail with respect to seven of the nine evaluation criteria. The nine criteria fall into three groups: Threshold, Primary Balancing, and Modifying. Each alternative (except no-action) must meet the threshold criteria. The primary balancing criteria are used to weigh major trade-offs among alternatives, and the modifying criteria may be fully considered only after State and public comment is received on the

Proposed Plan. Exhibit 9 presents the comparative analysis of alternatives against these criteria. The **FS** provides a detailed summary of how the comparison of alternatives was made.

Alternatives 2, 3a, and 3b are expected to comply with the chemical-, location, and action-specific **applicable or relevant and appropriate requirements** (**ARARs**) identified in the **FS**. No key **ARARs** that significantly differ between these alternatives were identified. In addition, these alternatives are not expected to require **ARAR** waivers pursuant to NCP 300.430(f)2(iv).

Exhibit 9. Detailed Evaluation of the Retained Remedial Alternatives

Remedial Alternative	*Description*	*Threshold Criteria*		*Balancing Criteria*					
		Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Present Value Cost (Dollars)	
1	No Action	⓿	⓿	⓿	⓿	⓿	❺	$	$104,000
2	ICs and **Engineered Controls** with Monitoring	❸	❹	❸	⓿	❹	❸	$$$	$623,000
3a	In-Place Containment of Contaminated Soil within the Flyway Subarea, ICs and **Engineered Controls** with Monitoring	❸	❹	❹	⓿	❸	❸	$$$	$681,000
3b	In-Place Containment and Removal of Contaminated Soil within the Flyway Subarea, Offsite Disposal at the Former Libby Vermiculite Mine, ICs and **Engineered Controls** with Monitoring	❸	❹	❹	⓿	❸	❸	$$$	$695,000

1. Numerical designations for the qualitative ratings are used to illustrate a range of compliance with that criterion.
2. Detailed cost spreadsheets for each alternative are presented in the FS (within a -30 to +50 percent range).

Threshold and Balancing Criteria (Excluding Cost)

- ⓿ **None**
- ❶ **Low**
- ❷ **Low to Moderate**
- ❸ **Moderate**
- ❹ **Moderate to High**
- ❺ **High**

Balancing Criteria (Present Value Cost in Dollars)

- ⓿ **None ($0)**
- $ **Low ($0 through $250K)**
- $$ **Low to Moderate ($250K through $500K)**
- $$$ **Moderate ($500K through $1M)**
- $$$$ **Moderate to High ($1M through $1.5M)**
- $$$$$ **High (Greater than $1.5M)**

EPA's Preferred Alternative

EPA's preferred alternative for cleanup of contamination at OU2 is: Alternative 3b, In-Place Containment and Removal of Contaminated Soil within the Flyway Subarea, Offsite Disposal at the Former Libby Vermiculite Mine, **ICs** and **Engineered Controls** with Monitoring.

As discussed earlier, Alternative 3b provides protection of human health by addressing two isolated areas of contaminated soil in the Flyway and by maintaining and protecting remedies put in place under past response actions. In-place containment (protective covers) will be used in a small area of the Highway 37 embankment and removal and offsite disposal will be used in the area surrounding sample location 1-03000. **ICs** (administrative) coupled with **engineered controls** (physical) would be used to restrict access and use of areas containing contaminated soil, including subsurface soils covered under previous response actions and seasonally flooded areas in the Flyway where presence or absence of **LA** contamination is unknown.

Covers would be seeded to minimize erosion. Long-term **O&M** would be required to maintain the integrity of the **engineered controls,** backfilled areas and covers, including covers placed during previous response actions and as part of this alternative. Monitoring would be used to ensure these controls are protective.

Est. Total Capital Costs: $338,000
Est. Total O&M and 5-Year Review Costs (first 30 years): $984,000
Est. Construction Timeframe: less than one construction season (May to October)
Est. Total Alternative Cost (PV): $695,000

Approximate quantities of materials were used in the evaluation of the remedial alternatives in the **FS** process and approximately include: 5000 square feet of surface area for covers, 10000 square feet of surface area for removal, 400 loose cubic yards (cy) of common fill for covers and excavations, and 300 loose cy of topsoil for covers, 3300 feet of fencing, and 11 warning signs. Final quantities will be determined in the design process and may vary significantly.

Details of Implementation for Alternative 3b

- A soil cover would be used because of ease of installation, availability of borrow soil resources, and affordability compared to other types of covers (e.g., geosynthetic or concrete/ asphalt).
- Offsite subsoil and topsoil sources outside of the Libby valley (used for the ongoing Libby cleanup efforts) would also be used.
- The cover thickness and materials used will be refined in the remedial design process (e.g., 12 inches of subsoil and 6 inches of topsoil).
- A visible marker layer would be placed at the bottom of the covers and excavations to denote the extent of the cleanup
- During construction, water-based dust suppression (using water from the pump house) would likely be used to prevent asbestos fibers from becoming airborne. Chemicals could be used as an alternative to water, if necessary.
- **ICs** and monitoring (inspections) would be used.
- **Engineered controls** would be used to prevent access to seasonally flooded areas in Area 2. They would likely consist of fencing and warning signs. Signs would be installed at all entrances and at appropriate intervals along the fence perimeter.
- The community would be kept informed during remedy implementation and **five-year site reviews**. Reviews are required because contaminated soil left in place below covers prevents unrestricted use.

As seen in Exhibit 9, Alternative 3b is preferred because it performs better than Alternative 2 or 3a without a significant increase in cost.

Overall protection of human health and the environment	❸ Moderate
Compliance with ARARs	❹ Moderate to High
Long-term effectiveness and permanence	❹ Moderate to High
Reduction of toxicity, mobility, or volume through treatment	❶ None
Short-term effectiveness	❸Moderate
Implementability	❸Moderate
Cost	$$$ Moderate

Opportunities for Public Involvement

Public Meeting

EPA will provide a short presentation about the proposed plans for both OU1 and OU2 at a public meeting in September 2009. It's a great opportunity to learn more about the details.

Libby Asbestos Superfund Site
Public Comment Meeting

Monday, Sept. 28, 2009
7:00 to 9:00 pm
Little Theater
724 Louisiana Ave.
- (School Administration Building)

Libby, MT

If you like, you can provide your comment orally at the public meeting, and the meeting stenographer will record it.

Contacts

If you have questions or need additional help, please feel free to contact the following representatives:

Rebecca Thomas, Project Manager
U.S. EPA, Region 8
1595 Wynkoop Street
Denver, Colorado 80202
(303) 312-6552
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Dick Sloan, Project Officer
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P.O. Box 200901
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Written Comments and Extensions

The public comment period for the Proposed Plan runs from September 16 to October 16, 2009, and may be extended 30 days with a formal request to EPA. You can submit a comment in writing (by mail, email, or at the public meeting). The mailing address for written comments is:

Ted Linnert
Office of Communications & Public Involvement
U.S. EPA, Region 8 – 8 0C
1595 Wynkoop Street
Denver, Colorado 80202
Email: linnert.ted@epa.gov

Documents

All public project reports and documents are available for viewing at EPA's web site or at one of the document repositories. These are also excellent sources for all sorts of project information (fact sheets, brochures, etc.).

www.epa.gov/libby

EPA Superfund Records Center
1595 Wynkoop Street
Denver, CO 80202
(303) 312-6473

EPA Information Center
108 E. 9th Street
Libby, MT
(406) 293-6194

Useful Terms

Understanding environmental cleanup can be daunting for the average person. The following are definitions of commonly used terms at the Libby Asbestos Site to aid your understanding of this document.

- **Applicable or relevant and appropriate requirements (ARARs).** Any state or federal statute that pertains to protection of human life and the environment in addressing specific conditions or use of a particular cleanup technology at a **Superfund** site.
- **Exposure.** The amount of pollutant present in a given environment that represents a potential health threat to living organisms.
- **Exposure Pathway**. The path from sources of pollutants via, soil, water, or food to man and other species or settings.
- **Feasibility Study (FS)**. The **FS** is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. It is conducted concurrently with the **RI**.
- **Five-Year Review. Remedial actions** that result in hazardous substances, pollutants, or contaminants remaining at a site above levels that allow for unlimited use and unrestricted **exposure** are required to be reviewed every five years to ensure protection of human health and the environment.
- **ICs and Engineered Controls. ICs** are actions, such as restrictive covenants, zoning ordinances, easements, deed restrictions, and building permits, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. **Engineered controls** are physical controls, such as fencing. Both types of controls are used to help preserve the integrity of the remedy.
- **Libby Amphibole Asbestos (LA)**. The term used to differentiate asbestos fibers originating from the W.R. Grace Mine from other types of asbestos. **LA** fibers have no odor, smell, or taste. They are not flammable. They do not evaporate in air, dissolve in water, or breakdown in dirt.
- **National Priorities List (NPL).** EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under **Superfund**. A site must be on the **NPL** to receive money for remedial action.
- **Operable Unit (OU).** A designation based on geography or other characteristics that defines a specific area of a site and enables the Superfund process to move forward in different areas at different times, speeding up the overall cleanup process at the site.
- **Operation and Maintenance (O&M).** Activities conducted after a **Superfund** site action is completed to ensure that the action is effective for the long-term.
- **Present Value (PV)**. The present value (of a sum payable in the future) calculated by deducting interest that will accrue between the current and future date.
- **Remedial Investigation (RI).** The investigation phase of the **Superfund** process that determines the nature and extent of contamination and assesses the risk to human health and the environment.
- **Remedial Action (RA)**. The actual construction or implementation phase of a **Superfund** site cleanup that follows remedial design. The remedial design is the design phase of a **Superfund** site cleanup that follows the signing of the **ROD** and precedes the **RA**.
- **Record of Decision (ROD)**. A public document that explains which cleanup alternative(s) will be used at **NPL** sites.
- **Superfund.** The program that funds and carries out EPA solid waste emergency and long-term removal and remedial activities. These activities include establishing the **NPL**, investigating sites for inclusion, determining priority, and conducting and/or supervising cleanup and other actions.

US Environmental Protection Agency
Region 8, 8 0C
1595 Wynkoop Street
Denver, Colorado 80202
Attn: Ted Linnert

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See inside for details on the

Proposed Plan

for cleanup of OU2 – the Former Screening Plant and nearby areas

Libby Asbestos Superfund Site

The public comment period begins on September 16, 2009
The public meeting is on September 28, 2009

(You should have already received the Proposed Plan for OU1 last week)