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Ref: EPR-ER

ACTION MEMORANDUM AMENDMENT

SUBJECT: Action Memorandum Amendment Requesting Formal Approval of a Ceiling Increase for the Time-Critical Removal Action at the Libby Asbestos Site - Libby, Lincoln County, Montana.

FROM: Robert E. Roberts
Regional Administrator

TO: Susan Parker Bodine, Assistant Administrator
Office of Solid Waste and Emergency Response

THROUGH: James Woolford, Director
Office of Superfund Remediation and Technology Inovation (OSRTI)

Site ID#: BC
Category of Removal: Time Critical, NPL, EPA Fund-Lead

I. INTRODUCTION

The purpose of this Action Memorandum Amendment is to formally request and document your approval of a ceiling increase for the Libby Asbestos Site (Site) in Lincoln County, Montana. The previous Action Memorandum Amendment addressing property cleanups in Libby, dated May 15, 2006 (approved June 2, 2006) set forth the need and scope for additional cleanup activities at the Site. Those cleanup activities are progressing and are still of a time critical nature. However, investigation efforts begun in May 2007 in the town of Troy, Montana (Troy is within the bounds of the Libby Asbestos Site) indicate that a significant number of properties there meet the current Site Removal Triggers (see Administrative Record, Cleanup Criteria Memo, December 15, 2003). In addition, on-going Remedial Investigations have discovered that portions of rip rap used to stabilize the banks of at least three local creeks was quarried from a syenite formation at the former vermiculite mine. This material contains rocks comprised of nearly 100% Libby amphibole asbestos (LA). Also, the nature of the clean ups in Libby are shifting to larger, and more difficult properties. In 2005 the average size of a property undergoing a clean up was 0.5 acres. In 2007, the average size of property undergoing design and clean up was closer to 3 acres (Attachment 1, CDM-Raines Memo 2007). This has lead to an increase in all aspects (design, removal, disposal, and restoration) per property costs. Also, one large scale commercial clean up has come up in the Libby property queue, the Cabinet View

Country Club. Sampling data indicate that the greens and tee boxes for the original nine holes of the golf course contain a drainage layer (within 4 inches of the surface) of LA bearing Libby vermiculite. This single property is likely to generate as much waste as 50 residential cleanups, with much higher restoration costs.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

The Libby Asbestos Site consists of eight operable units (OUs). OUOO and OU4 represent site-wide operable units for removal and remedial actions, respectively. OUs 1,2, 3, 5 and 6 are described in the next section. OU7 represents the town of Troy, Montana, and the immediate surrounding area. Troy is located 15 miles west of Libby and the town proper has a population of 957. There are approximately 1,100 residential and commercial properties within the Troy Study Area Boundary that will be investigated to determine if cleanup is required.

The initial Action Memorandum (May 23, 2000) and subsequent Amendments (July 2001; May 2002; May 2006; June 2006) provide basic descriptions of the vermiculite mine, vermiculite processing facilities, several contaminated properties, and the conditions found throughout the Libby Valley. The basic issue is that LA containing mine wastes, as well as off specification intermediate products (largely unexfolliated vermiculite concentrate) were made available, and hence, widely distributed, throughout southern Lincoln County for use as fill material and/or as a soil conditioner. Thus, when the Site was listed on the National Priorities List (NPL) it included the nearby town of Troy. While initial investigative efforts focused on the Libby area, in May 2007 the investigation and screening of properties in Troy was begun. This work, conducted by the Montana Department of Environmental Quality (MDEQ) through a cooperative agreement, is a planned two year effort. Through September 2007 the MDEQ has screened approximately 550 properties out of a targeted 1098. While a final report for the 2007 field season is still forthcoming, the MDEQ has indicated that over 140 of the properties screen meet the current Site removal criteria (See Attachment 2, MDEQ Letter, October 2007). Of these properties 27 were screened as "high priority" properties, due to the nature of the on-going exposure to LA. For example, at one residence vermiculite was seen to be actively falling from the ceiling directly onto the resident's bed. At the direction of the Site On-Scene Coordinator (OSC) stabilization efforts were undertaken to mitigate these exposures. Nonetheless, the situation is dire enough at six of these properties that, pending approval of this Action Memorandum Amendment, they will be moved to the front of the list of properties to be cleaned in 2008.

In addition to the residential and commercial properties of Troy and Libby another situation has arisen in Libby that needs to be addressed as part of the on-going Site response actions. In the winter of 1995/96 southern Lincoln County experienced flooding in almost all of its Creeks. In response Lincoln County and the Army Corp of Engineers (ACoE) undertook flood control and stream bed stabilization efforts in the Spring/Summer of 1996. Repair work was done on at least five creeks: Libby Creek, Granite Creek, Flower Creek, Parmenter Creek, and Callahan Creek. Records indicate that one of the three sources of rip rap used for this work

was a quarry operated by the Kootenai Development Corporation (KDC) within the boundaries of the former vermiculite mine. Portions of this quarry area contain intrusive veins of LA.

While the record is not clear of how much of this material was actually used, the State mining permit allows for up to 50,000yds.^{3} to be quarried. Field inspections conducted in July and August 2007 found LA bearing rocks in three of the five creeks: Flower Creek, Granite Creek, and Callahan Creek. Rocks of nearly pure LA, up to 25 pounds each, were found incorporated into the rip rap. While the inspections of Granite Creek and Callahan Creek found only localized deposits, the material was widely distributed on Flower Creek, starting from where Flower Creek enters the populated area to the middle of Libby where Balsam Street crosses over Flower Creek (see Attachment 3, Creek Investigation Report, CDM 2007). EPA continues to work with Lincoln County and the ACoE to assemble the available records of the projects, as well as to interview the personnel involved with the project. Further investigation as to the extent of contamination of all the creeks is still underway.

The Creeks in Libby see an abundance of recreational use. As Libby has no swimming pool, the Creeks tend to be popular swimming locations in summer months. Typically, children use the rip rap along the bottom and banks of the creeks to construct small dams. This creates a "swimming hole" behind the dams. Given the force of the water, and the nature of the use, the dams are quite transitory. Thus, they are quite often built, deconstructed, moved, and re-built throughout the summer months. Unfortunately, this tends to increase the frequency of direct contact of children with the LA bearing rocks.

As mentioned above, one other property currently on the clean up queue is worthy a separate discussion. The golf course at the Cabinet View Country Club (CVCC) was constructed beginning in 1956. Apparently, because of its availability and physical characteristics, vermiculite waste was used as a sub-grade drainage feature in all of the greens and tee boxes of the original nine holes. As a result, LA contamination can be found on these features, as well as in the areas immediately around them, and along drainage paths leading away from them.

Although the CVCC golf course is open from April 1 through October 31 each year. During the season the CVCC employs up to a dozen maintenance personnel who cut, rake, and tend to the course and contaminated areas daily. As is done with all of the commercial and residential properties that meet the current removal criteria, EPA's contractors conducted a pre-design inspection of the CVCC in July 2007. A property specific removal design, with specific excavation cut-lines, volume estimates, and restoration plans is currently in progress.

B. Other Actions to Date

The previous Action Memoranda each provide a description of various activities at the Site and their progress contemporaneous with their writing. Generally speaking activities in 2000 focused on the former W.R. Grace processing facilities (Export Plant, Screening Plant) that were large volume, obviously highly contaminated properties. In 2001, work on the processing areas continued, but also expanded to include some large volume cleanups of properties where vermiculite mining wastes had been extensively used (e.g. the High School and Middle School

tracks and the Plummer Elementary ice rink that were made of vermiculite mine tailings). It was not until late 2001 that the potential extent to which W.R. Grace had allowed the distribution of LA bearing mine waste throughout the community began to become clear. Subsequently, it was in 2002 when the clean up of residential and commercial properties began in earnest. Below is a summary table of the work done during the history of on-site Removal Actions, as well as a narrative synopsis of the work in question:

Table 1: Work to Date Summary

	Large Projects	Commercial/ Residential	Soil (yds^3)	VAI (yds.^{3})	Debris (yds.^{3})
2000	Screening Plant (SP), Export Plant(EP)	0	150,000	0	35,000
2001	SP, EP, Libby High School(LHS), Libby Middle School(LMS), Plummer Elementary, Seifke,	8	120,000	0	5,000
2002	SP, EP, LHS, LMS,	18	75,000	300	1,000
2003	Riverside Park	157	40,000 15,000	2200	?
2004	SP-Flyway	170	30,000 16,000	2300	?
2005		225	31,000	2700	?
2006		216	26,000	3100	?
2007		160	46,000	2200	?
Total		**894**	**549,000**	**12,800**	

Synopsis of Previous Actions

Export Plant (OU1) Pursuant to a Unilateral Order from EPA, W.R. Grace demolished and disposed of four buildings on the property and removed approximately 15,500 cubic yards of contaminated soil and 2500 cubic yards of debris from the property. Region 8 completed remaining demolition work of one building in 2002. The lumber business formerly operating at this location was relocated by W.R. Grace in 2003 to a new location in Libby. Removal work here is complete. All this work is summarized in a Data Summary Report (CDM 2007) found in the Administrative Record

Riverside Park and Boat Ramp (OU1) This is an area adjacent to the former Export Plant along the Kootenai River. Although it was not part of the W.R. Grace operations, it is now included as part of OU1. In 2003, subsurface contamination was encountered during construction of a new park and boat ramp being built by the City of Libby. EPA halted construction and cleaned the parcel in late 2003. Approximately 15 acres of soil were excavated to an average depth of two feet. This resulted in the removal of approximately 40,000 yds.^{3} of contaminated soil. Cleanup and restoration are complete. All this work is summarized in a Data Summary Report (CDM 2007) found in the Administrative Record

Screening Plant (OU2) This property consists of five distinct, contiguous parcels. In total, roughly 335,000 yds.^{3} of contaminated soil, and 30,000yds.^{3} of debris were removed from the Screening Plant and taken to the mine for disposal. All currently planned removal actions are completed. All this work is summarized in a Data Summary Report (CDM 2007) found in the Administrative Record. The five parcels include:

(1) **Raintree Nursery**. Region 8 completed cleanup of this parcel in 2003. Approximately 17 acres were addressed, and 250,000 cubic yards of contaminated debris and soil were removed. Restoration of this parcel is complete.

(2) **North Side Parker Property.** Region 8 completed cleanup here in 2004, addressing approximately four additional acres. Approximately 18,000 cubic yards of contaminated soil were removed

(3) **Flyway Property.** Region 8 completed approximately !/4 of the cleanup of the Flyway parcel in 2002; W.R. Grace, pursuant to an Administrative Order on Consent with EPA, cleaned up the remainder of the parcel in 2004. In all, approximately sixteen acres were addressed, and approximately 50,000 cubic yards of soil were removed. EPA, working with the Montana Department of Transportation, capped a contaminated area on the Highway 37 right of way along the Flyway in 2005.

(4) **KDC Bluffs Property**. Three al areas of the KDC Bluffs parcel contained piles of waste vermiculite and debris. These were cleaned up by EPA in 2001 with approximately 15,000. There remains a section of the KDC Bluffs that has been found to have levels of LA at <1% over two to three acres. At the time of the Removal Action these areas were unoccupied, and as such were left for future Remedial Actions. Unfortunately, an out of state homeowner built a house on this portion of the property in 2006. The homeowner was informed by EPA of the existing contamination prior to the construction of the home. EPA Region 8 is currently accessing the appropriate course of action.

(5) **Wise Property.** This is a ¾ acre property between Raintree Nursery and the Flyway. Approximately 2000 cubic yards of LA contaminated soil was removed in 2001. This property was used as an access point for the flyway clean up, thus the restoration was not completed until 2005.

Mine/Rainy Creek Road (OU3) Rainy Creek Road is a US Forest Service (USFS) access road to the Kootenai National Forest and the former vermiculite mine. Like the mine itself, Rainy Creek Road is highly contaminated with LA, and site access remains restricted. In actions conducted in 2001 and 2003, EPA paved the lower portion of the road starting from where it intersects Highway 37. A decontamination station has been in place on the road since 2000 to facilitate soil disposal at the former mine, as well as to clean other vehicles accessing the area. Soil disposal at the mine is ongoing. In 2007 EPA signed an AOC with W.R. Grace to conduct a Remedial Investigation/Feasibility Study (RI/FS) on OU3. Initial sampling was started in September 2007, with the bulk of the investigation targeted for.

Libby High School and Libby Middle School Tracks (in OU4). Cleanups completed by 2001. Both tracks were restored in 2002. Work is complete.

Siefke Property **(in OU4)** Highly contaminated, large residential property which was identified early. A considerable volume of equipment and debris from the former vermiculite mine had come to be located on the property. Cleanup was completed in 2002, and restoration was completed in 2003.

Johnson, Sanderson, Temple, Struck, Rice, Fuhlendorf, Spencer, and Westfall properties (in OU4. These properties were highly contaminated residences which were identified early in EPA's investigations. These properties contained mine wastes with LA concentrations up to 10%. All cleanup and restoration was completed by 2003.

Champion Haul Road (OU4). Vermiculite mine tailings had been used to make and/or repair portions of a gravel road leading into a subdivision. Cleanup was completed in 2003.

Additional Residential/Commercial Properties (OU4) Once the Libby Asbestos Site was placed on the NPL in October 2002, the EPA began as part of its RI to systematically inspect and sample the parcels of land within the Site boundary. This information was also used to identify properties in need of time-critical Removal Actions. To date, EPA has conducted such inspections at over 4000 properties (see Contaminant Screening Study (CSS), CDM 2004 in the AR). This screening effort identified roughly 1400 properties that meet the removal criteria laid out in the December 2003 Memorandum. As of October 26, 2007, Removal Actions have been completed at 894 of the identified properties. It should be noted that the CSS also identified an additional 700 properties that had LA contamination, but did not meet the current removal criteria. Also, to date the EPA has been denied access to inspect an additional 350 properties in OU4. The 700 properties are being evaluated further to assess the exposure presented by the remnant contamination so as to support an appropriate Baseline Risk Assessment (BRA). Also, depending on investigative funds available, each year attempts are made to screen the unevaluated properties.

Former Stimson Lumber Mill (OU5) The former Stimson Lumber Mill contained VAI in a number of its buildings. Apart from EPA's actions the Stimson Lumber Company systematically removed all of its loose and accessible VAI in 2002 and 2003. Due to a downturn in the lumber market, most of the Mill operations were closed in 2003, and a large portion of the 400 acre

parcel were sold to the Kootenai Redevelopment Authority in 2004. The Redevelopment Authority has been, and is now actively seeking business to reuse the former Mill. Investigations to date have found only a relatively small area of OU5 (a former nursery area) soil contamination. This area was fenced off in 2004. The only other area of this OU that presented an obvious need for clean up is the former Central Maintenance Building (CMB). Portions of the roof and walls of the CMB contained VAI that was not removed by Stimson. After the Mill closed portions of this roof began to deteriorate and leak VAI into the interior of the building, which is occupied by new tenants. EPA removed the dilapidated portion of the roof in 2005. This work is summarized in a Data Summary Report (CDM 2007) found in the Administrative Record The EPA continues to take steps to finalize a RI/FS for this OU

Burlington Northern Santa Fe Rail Yard (OU6) The Burlington Northern Santa Fe (BNSF) Rail Yard is located adjacent to the former Export Plant, and was used to facilitate rail shipments of vermiculite. OU6 is comprised of the rail yard, and the rail lines leading out of Libby in both directions. Pursuant to an AOC with EPA, BNSF began cleanup of the contaminated rail yard in 2003 but had to cease work due to complexities with soil removal below the tracks. Work resumed in 2004. Most of the tracks in the rail yard were removed to allow for clean up underneath them. Although, most of the contaminated soil was removed some contamination was capped in place. Institutional controls for contamination that was left in place will be evaluated as part of the RI/FS and future ROD. At this time, the planned removal work is now complete. The EPA is working with BNSF to finalize the investigations needed to complete an RI/FS for this OU.

Troy (OU7) As mentioned previously, systematic investigations of properties in the Troy area were begun in May 2007. However, prior to this investigation EPA has conducted several small scale responses in Troy as conditions warranted. The largest of which was the removal of VAI from the Troy High School. This particular action is discussed at length in the June 2006 Action Memorandum Amendment. The other actions typically involved the clean up and disposal of VAI that has been encountered unexpectedly by a property owner.

Environmental Resource Specialist (Site Wide) During the course of the clean up operations over the last five years, the EPA has been faced with unplanned, somewhat urgent exposures to VAI and LA. These can take on many forms. For example, this past construction season there were three house fires on properties that contained VAI. Likewise, a new homeowner in Libby was undertaking some home renovations and encountered VAI in the walls of his bathroom, contaminating a portion of his home with LA. The EPA also has received a large number of calls from property owners who are planning a renovation that may encounter LA bearing materials. Clearly, in these later cases the better course of action is to delineate any potential LA contamination prior to the renovation, and to conduct preventative removals as appropriate without the property owner being exposed. The need for this function is also likely to live beyond the EPA's Response Actions in Libby. Because of this, beginning in October 2006, the EPA began providing a full time service, nominally entitled the Environmental Resource Specialist (ERS), where property owners, firemen, or other affected response personnel or citizens can obtain access to LA expertise outside of the normal course of scheduled clean up actions. In 2007, the ERS service typically received around 40 calls per month requesting

assistance. Again, typically, these calls result in around five small scale responses per month, and resulted in the incorporation of five larger scale clean ups into the normal queue.

Lincoln County Landfill Asbestos Cell In order to facilitate the disposal of VAI, and to allow for a longer period of seasonal operation, in 2003 EPA constructed an asbestos disposal cell at the Lincoln County Landfill. To date, the EPA has place over 20,000 yds.^{3} of VAI and LA contaminated debris at this cell. Disposal operations are ongoing.

C. Current Actions

EPA Region 8 has just completed its 2007 construction season. Work is already underway putting together property specific clean up designs for the 2008 construction season. Looking at the properties in the planned queue for 2008 (excluding the Creeks and the CVCC) and the projected Remedial Action budget for Fiscal Year 2008 ($17M) for the Site, the Region will target another 160 properties for clean up. Based upon the last five years experience this will require the generation of clean up designs for 200 properties, and the conduct of 240 Pre-Design Inspections (PDIs). This planning work is on schedule to start the 2008 season. These designs will include the six properties from Troy mentioned previously.

Although it does not appear funding will be available conduct response actions in 2008, EPA Region 8 will put together clean up designs for Flower Creek and the CVCC in the event that money becomes available to conduct the clean ups. In the interim, EPA has posted warning signs on the identified, impacted sections of Flower, Granite, and Callahan Creeks. In addition to the warning signs, temporary covers have been placed on the sections of Flower Creek closest to nearby residences.

In 2007 EPA Region 8 initiated major investigative efforts to continue to assess the efficacy of the on-going removal actions, as well as to provide the needed exposure assessments to support a BRA. The Sampling and Analysis Plans (SAPs) for these investigations are entitled:

(1) SAMPLING AND ANALYSIS PLAN FOR OUTDOOR AMBIENT AIR MONITORING AT THE LIBBY ASBESTOS SITE, OPERABLE UNIT 4, LIBBY, MONTANA (SEPTEMBER 2006)

(2) SAMPLING AND ANALYSIS PLAN FOR ACTIVITY-BASED OUTDOOR AIR EXPOSURES OPERABLE UNIT 4, LIBBY, MONTANA, SUPERFUND SITE (July 2007)

(3) SAMPLING AND ANALYSIS PLAN FOR ACTIVITY-BASED INDOOR AIR EXPOSURES, OPERABLE UNIT 4, LIBBY, MONTANA, SUPERFUND SITE (July 2007)

The development of these SAPs was based on the current Conceptual Site Model (CSM) for OU4. These investigations were all designed as multi-year efforts and are on-going. They will be

continued in 2008 depending on available funding. These documents, including the CSM, can be found in the Site AR.

While all of properties remaining to be cleaned up have conditions justifying time critical removal actions, cleanup of these properties using removal authority will generally continue only until publication of the ROD for OU4. Upon publication of a ROD cleanup will continue using remedial authority. Remedial authority will then be used to clean up the remaining properties that meet time critical removal action criteria, and properties that may meet future criteria established for remedial action. EPA may encounter situations in the future for which removal actions are appropriate, even after a ROD is published. EPA will continue to prioritize properties that meet time critical removal action criteria and conduct cleanup as rapidly as resources and conditions permit. The ROD will establish final cleanup levels and criteria for the Site. This will enable Region 8 to more accurately quantify the total number of properties requiring cleanup, and to clarify if the current set of removal actions are sufficient, or need to be modified.

In addition to conducting physical cleanups, EPA also continues to provide guidance, training, and assistance for Libby residents. Such actions include the ERS service; the development and publication of fact sheets for residents and local contractors who may encounter vermiculite and asbestos; asbestos abatement and health and safety training for local contractors; and public warnings for areas of contamination discovered in public areas. These actions are intended to address ongoing exposures that cannot be immediately addressed through removal actions.

The MDEQ has completed its planned investigative efforts for Troy for the 2007 season. The field investigations in Troy are planned to resume in March 2008, depending on available funding. EPA Region 8 had hoped to begin taking steps to begin the full scale start of property clean ups in Troy. However, the Region was advised not to submit a separate funding request to the National Remedial Priority Panel, and to plan on receiving the $17M is Remedial Action funds that the Site has received annually for the past five years. Given this, only those properties in Troy that pose the most immediate exposure will be addressed in 2008, and full scale work in Troy will not begin until sometime in the future.

Follow up RI/FS sampling investigations were begun at OU1 and OU5 in 2007. It is hoped that these investigations will be completed in 2008, along with those for OU2 and OU6. However, completion of these investigations is dependent on available funding.

For a number of years the EPA has struggled at Libby Asbestos Site with the rather intracted scientific problem of the inherent toxicity of Libby Amphibole Asbestos. The controversy over how to assess risk, and how to establish "how clean is clean" in Libby culminated with the EPA inspector General issuing a "Flash Report" in December 2006 (see IG Report, December 2006, and subsequent correspondence in the Site AR). The IG Report criticized the EPA, for among other things, not conducting the necessary toxicity assessment of Libby Amphibole Asbestos so as to facilitate a proper BRA for Libby. While the EPA did not concur entirely with the findings of the IG Report it did and does recognize the need to focus on resolving, to the extent possible, these issues. To this end in 2007 the EPA developed and began

the implementation of the Libby Action Plan (LAP) (see LAP in the Site AR). The plan involves the ambitious collaboration of a number of federal and academic scientists in the conduct of a series of analytical, epidemiological, and toxicological studies designed to gauge the relative toxicity of LA versus other forms of asbestos thus increasing the accuracy and reducing the uncertainty surrounding the formulation of a BRA for Libby. The current estimate is that the LAP is a three year effort. Two specific products are anticipated upon the execution of the LAP. The first is a better, more physiologically grounded model for quantifying the risk of causing lung cancer and/or mesothelioma resulting from exposure to LA. Likewise, it is anticipated that an appropriate Reference Concentration (RfC) for the development of fibrosis related diseases can also be developed and used to assess risk in Libby.

D. State, Local, and Other Authorities Roles

There are no significant changes in roles from the May 2006 Action Memorandum Amendment. As discussed earlier, the MDEQ has taken the lead role for the investigation and screening of Troy (OU7). The Agency for Toxic Substances and Disease Registry (ATSDR); the United States Geologic Service (USGS); and the National Institute for Occupational Safety and Health (NIOSH) are active participants in the LAP. The USGS also continues to provide EPA with technical assistance regarding the mineralogy, morphology, and measurement of Libby asbestos. Lincoln County and the City of Libby are active in several local advisory groups and coordinate directly with EPA on many issues regarding the removal actions and remedial investigations. In addition to their lead role for Troy, the MDEQ continue to coordinate with EPA on the implementation of all removal actions and remedial investigations.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Despite significant progress on cleanup, conditions in Libby still present significant threats to public health. EPA has considered all of the factors described in Section 300.415(b)(ii) of the NCP, and has determined at least two of the factors continue to be present at the Libby Asbestos Site (including Troy):

A. Threats to Public Health or Welfare:

(i). *Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants and contaminants*;

Libby asbestos contaminated source materials (e.g., indoor dust, yard and garden soils, driveway materials, vermiculite insulation) are still found throughout the community. The previous Action Memoranda all have described these conditions in detail. Previous investigations have shown that more than one-third of the approximately 4000 properties in the Libby area contain varying levels of contaminated source materials, such as vermiculite insulation or contaminated soils. In October 2007 EPA finalized a report entitled:

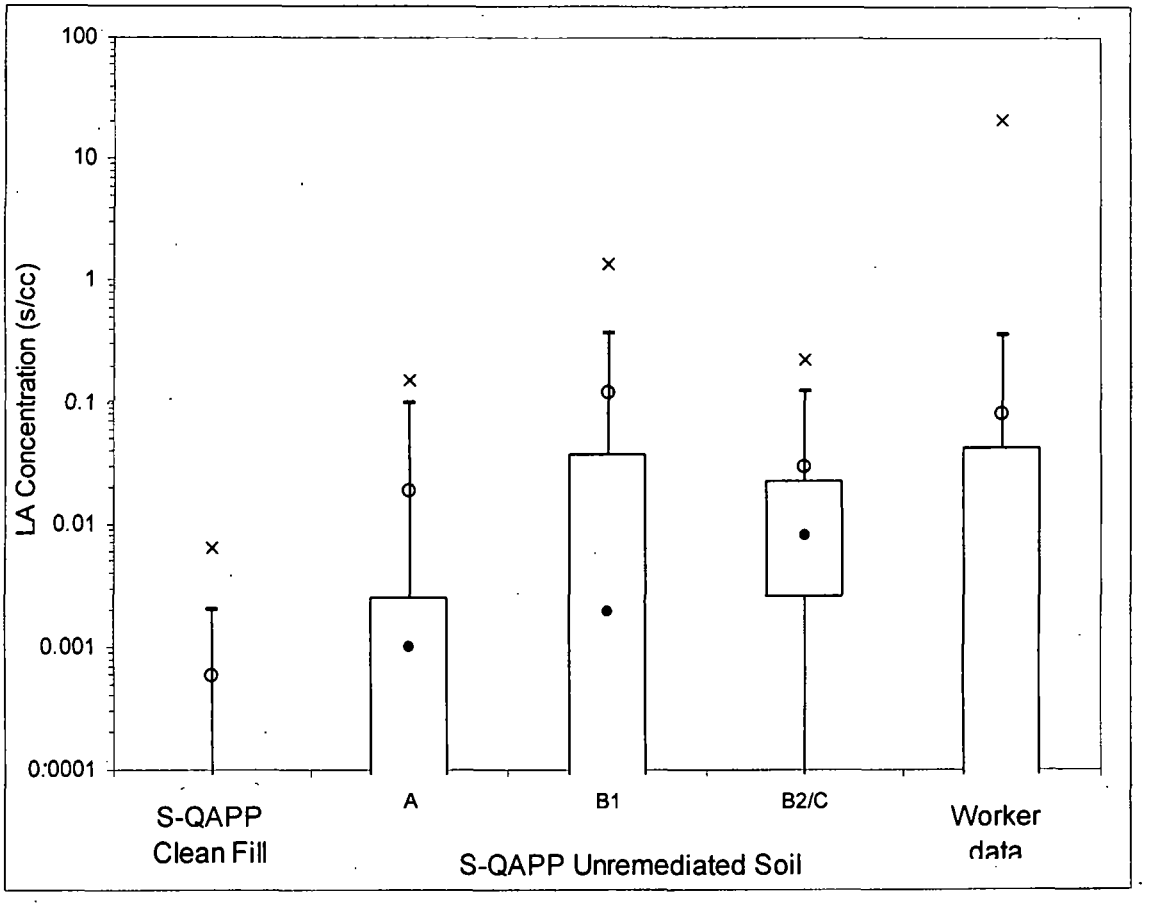
SUMMARY REPORT FOR DATA COLLECTED UNDER THE SUPPLEMENTAL

REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN (SQAPP), FOR LIBBY, MONTANA (October 2007)

Known as the SQAPP Report, this document presents the findings of a number of sampling investigations conducted over the last few years in Libby (included as Attachment 4). One section of the SQAPP Report deals with the measurement of LA in personnel monitors during routine activities that disturb local soils and can be summarized here in Figure 1and Table 2. The data here illustrate that low levels of LA in soils (A=ND by PLM; B1=<0.2%; B2= 0.2% > [] <1%) can still generate airborne fiber levels of LA at or near the current OSHA Permissible Exposure Limit of 0.1 f/cc. While the OSHA PEL is not considered an appropriately protective exposure metric for residential settings, it does provide a relative gauge of the exposures seen. Even the bin "A" soils which were non-detect for LA by PLM (but may contain visible vermiculite) generated measurable levels of LA. This data is entirely consistent with work done by W.R. Grace handling various vermiculite bearing materials reported in previous Action Memoranda, and contained in the Site AR.

Investigations have clearly shown elevated levels of Libby asbestos in the dust of resident's homes. (CDM, 2002, 2003a and 2003b; EPA Region 8, 2003) This dust contamination comes from several sources including but not necessarily limited to: contaminated soil at the property that is tracked into the home; contamination that was picked up at former vermiculite processing facilities in the past and brought home on clothes and equipment; releases of vermiculite insulation from the attic or walls. As discussed above, these asbestos contaminated source materials, when disturbed, may release asbestos fibers to the air resulting in complete exposure pathways. This includes VAI. Actual exposure to these contaminated source materials may occur daily depending on the conditions and usage of the specific properties. Activities similar to those that are likely to be performed by area residents and workers can result in elevated concentrations of respirable asbestos fibers in air.

FIGURE 1. TOTAL LA LEVELS IN PERSONAL AIR SAMPLES NEAR SOIL DISTURBANCES



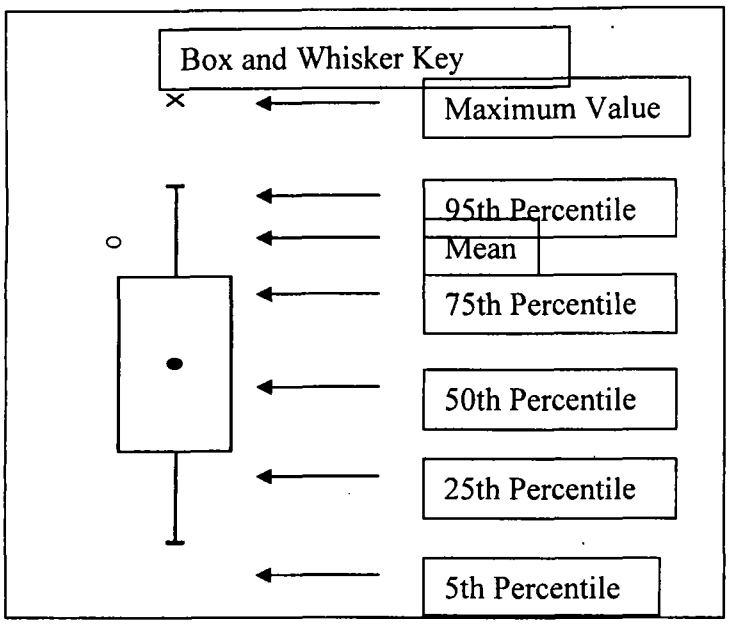


Table 2. TOTAL LA LEVELS IN PERSONAL AIR SAMPLES NEAR SOIL DISTURBANCES

Metric	S-QAPP Clean Fill	S-QAPP Unremediated Soil			Worker data (OU4)
		A	B1	B2/C	
N	21	10	21	13	1434
DF	24%	60%	67%	77%	43%
Max	0.006	0.150	1.34	0.23	21.0
95%	0.002	0.097	0.374	0.123	0.359
75%	0.000	0.003	0.037	0.023	0.043
50%	0.000	0.001	0.002	0.008	0.000
25%	0.000	0.000	0.000	0.003	0.000
5%	0.000	0.000	0.000	0.000	0.000
BE	0.00059	0.019	0.12	0.029	0.082
UCL	7.75E-03	2.85E+05	5.13E+03	6.88E-01	1.61E-01
UB	0.0064	0.15	1.3	0.23	0.39

Further, concentrations of fibers in air generated by disturbance of contaminated source materials may exceed OSHA occupational standards and EPA cancer risk guidelines (EPA Region 8, 2003; Weis, 2001; Miller, 2005; EPA Phase 2 Report, 2006).

Based on findings from the summer of 2007, it is also clear that a large number of children are exposed to high concentrations of LA while playing in the areas creeks. In July 2007, members of the Environmental Response Team undertook an Activity Based Sampling investigation in Flower Creek. This investigation found that exposure to LA reach xx f/cc (see Creek ABS Data, Attachment 5) during the building of a small "dam" as is typical for children in Libby in the summertime. While warning signs have been posted, this is hardly an effective long-term deterrent for this exposure.

Asbestos fibers from the Libby mine site are hazardous to humans as evidenced by the occurrence of asbestos-related disease in area residents and workers. Workers and area residents exposed to asbestos fibers from the Libby mine site have been found to have increased mortality and morbidity from asbestos-related conditions, including asbestosis, pleural fibrosis, lung cancer, and mesothelioma. Asbestos-related lung diseases have also been observed in area residents with no direct occupational exposures, including family members of mine workers, and even in those with no known association with the vermiculite mining or processing activities (Weis, 2001; Miller, 2005; ATSDR 2002; ATSDR 2005).

(ii). *High levels of hazardous substances or pollutants and contaminants in soils largely at or near the surface that may migrate.*

Soil contamination is prevalent throughout the Libby area. Region 8 has focused resources on cleaning up areas that were most highly contaminated, but many residential yards still contain measurable concentrations of Libby asbestos at or near the surface (CDM, 2002, 2003a, 2003b). These soils, if unaddressed, can cause direct exposure when disturbed through normal activities and can contaminate the interior of homes with asbestos-containing dust.

While most of the known larger contaminant sources and public areas (such as former vermiculite processing plants, schools, ball fields, and Riverside Park) have already been cleaned up, Region 8 has discovered several new "public" areas of contamination in Libby as well. These include the CVCC golf course, the right-of-way along Highway 37, the public compost pile at the county landfill, the Creeks, and others. Some of these properties presented immediate, unacceptable risks and were cleaned up quickly. For other properties, such as portions of the former Stimson Mill, the Highway 37 ROW, and the CVCC golf course, EPA has instituted interim containment measures such as fencing and/or issued public warnings. These properties continue to be earmarked for removal action.

B. Threats to the Environment

Work on an ecological risk assessment was initiated in September 2007. While currently no response actions are based on ecological impacts at the Site, this may change as data is

collected.

IV. ENDANGERMENT DETERMINATION

The actual or threatened releases from this Site, if not addressed by continuing to implement the time critical removal actions set forth the in the original Action Memorandum and subsequent Amendments, may present an imminent and substantial endangerment to public health or welfare or the environment. The original Action Memorandum for the Site, dated May 23,2000 (EPA Region 8,2000), as well as subsequent Amendments and the administrative record, describe in detail the toxicity associated with Libby asbestos, the significantly elevated disease rate in Libby residents, and the variety of conditions present in and around Libby that lead to continuing exposures.

V. EXEMPTION FROM STATUTORY LIMITS

The Libby Action Memorandum dated May 23, 2000, provided the documentation required to meet the NCP Section 300.415(b)(2) criteria for a removal action. This Action Memorandum also provided EPA's determination regarding the applicability of CERCLA Section 104(c)(l) [NCP Section 300.415(b)(5)(i)]. This provision allowed for using the emergency exemption from the $2 million and one year limits on removal actions. The two most recent Action Memorandum Amendments dated May 2006 and June 2006 expanded the scope of removal actions and raised the approved removal ceiling to $91,837,000. It also found that conditions at the Site continued to satisfy the emergency exemption and met the CERCLA Section 104(c) [NCP Section 300.415(b)(5)(ii)] consistency exemption, which allows for a continued removal action over the cap when it is "otherwise appropriate and consistent with the remedial action to be taken." The conditions necessitating time critical removal action in Libby still exist and continue to satisfy both the emergency and consistency exemptions from the statutory limits.

This Action Memorandum Amendment formally requests a ceiling increase under the already granted exemption from the statutory limits. This ceiling increase is necessary to continue the removal action originally authorized by the May 9, 2002 Action Memorandum Amendment, as amended by the two Action Memoranda from 2006. As discussed later in this Action Memorandum Amendment this scope would not explicitly include properties in Troy, Montana (OU7), which meet the current Site Removal Criteria. An emergency exemption continues to be warranted to protect public health. Imminent and substantial risks to the public health of Libby residents continue to exist (Miller, 2005). Due to the prevalence of past and current exposures, and the observed high rate of asbestos related diseases, these risks are of an immediate and emergency nature. While conditions have improved considerably through EPA intervention, hundreds of properties meeting criteria set forth by EPA Region 8 for time critical removal actions have yet to be addressed. Exposures to an already impacted population continue to occur, and EPA is the only Agency with the resources to mitigate these conditions. In addition to meeting the criteria for an emergency condition, removal actions are also expected to be appropriate and consistent with future remedial actions, and thus continue to also meet the criteria for a consistency exemption from the $2 million and one year limits on removal actions as set forth in Section 300.415(b)(5)(ii) of the NCP. There are several reasons for this:

- Libby Asbestos (LA), the contaminant of concern in Libby, is a naturally occurring mineral. There are no known viable treatment technologies that can diminish or reduce the toxicity of asbestos. To address exposures from asbestos, the most viable and commonly used physical cleanup options available are to remove it or to contain it. For time critical removal actions at the Site, Region 8 has used a combination of these approaches as appropriate.

- Because asbestos use was widespread in the past, the basic approach for asbestos abatement is well understood. There are a limited number of options available for cleanup. Most importantly, when asbestos is determined to be friable, the preferred mechanism to address potential exposures is to remove the source.

- Investigations have shown that sources of Libby asbestos, including, but not limited to, contaminated soil, vermiculite insulation, and vermiculite processing wastes are prevalent throughout Libby. Past and current investigations have clearly shown that, when disturbed, these sources can release asbestos to the air and have the potential to contaminate indoor dust. This appears to be true even LA concentrations in the source material are relatively low (SQUAPP Report, EPA 2007). The primary objective of the removal actions in Libby is to remove or isolate these sources. Any future remedial actions are likely to employ source removal as a key component of cleanup.

- To EPA's knowledge, large-scale removal of vermiculite insulation had not been attempted prior to EPA's cleanup in Libby. Due to the highly friable and pervasive nature of this material, it presented numerous technical challenges. Various cleanup techniques for dealing with vermiculite insulation and other media were evaluated during the initial cleanups of residential/commercial properties. Region 8 used this experience to evaluate the efficacy of various approaches and to refine our cleanup strategy. This information will be used in the RI/FS.

- While the basic approach to asbestos cleanup is well understood and relatively simple, the degree to which cleanup is necessary, and exactly which situations require cleanup, have been, and will continue to be controversial. A large degree of uncertainty exists in the scientific community as to (1) what constitutes a "safe" level of asbestos in soil, dust, and other media and (2) how to effectively measure these levels. This makes establishment of site-specific action levels extremely challenging. As described in Section II (C) of this Amendment, EPA is currently working to resolve these difficult issues and continues to evaluate the effectiveness of interim containment measures instituted as part of removal actions. However, to ensure that Removal Actions are protective and consistent with future remedial actions at Libby, Region 8 has taken a conservative approach and adopted protocols that attempt to minimize the possibility of having to clean up a property twice. In general, EPA only begins a cleanup if a property has conditions that warrant a time critical removal action, but once a cleanup begins, EPA addresses lower levels of contamination that may exist on some portion of the property. Initial post-cleanup sampling provided some validation of the efficacy and protectiveness of the cleanups

(CDM, 2003c, 2004). However, data included in the SQUAPP report raise some concerns as to whether the current approach to Removal Action is sufficiently protective over the long-term. Nonetheless, this approach ensures the worst risks are addressed first and that cleanups reduce the most prevalent exposure pathways, while the effort to determine what will be an effective final cleanup moves forward. The RI/FS will evaluate current cleanup protocols as well as other options for cleanup.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Action Description

The Action Memorandum Amendment from May 2002 sets forth the basic scope for the current set of Removal Actions at the Libby Asbestos Site. While the basic need for cleanup and the general nature of the proposed actions has not changed, EPA has discovered that (1) more properties require cleanup than originally anticipated and (2) the difficulty and cost of cleanup are higher than originally anticipated. Currently, approximately 1400 properties in the Libby area currently meet the Removal criteria for the Site. In addition, the first year of full scale investigations of properties in Troy, Montana indicate that roughly 140 of the 550 properties screened also meet the current set of removal triggers. It is therefore not unreasonable to project that a total of approximately 300 properties in Troy will also need Removal Action, thus a total of 1700 properties in all. With 894 property cleanups in Libby completed to date, slightly more than 800 properties remain to be completed. Also, while this data is not yet available for Troy, in Libby there are approximately 700 properties that have some level of LA contamination, but do not meet the current set of Site Removal criteria. If either the on-going set of investigations for exposure assessment, or the results coming from the LAP, indicates that risks in Libby are higher than currently thought, then the total number of properties requiring a removal could increase substantially.

The data from the SQUAPP Report also indicates that a modification to the current approach to Removal Actions be made. Based on the December 15, 2003 document:

LIBBY ASBESTOS SITE RESIDENTIAL/COMMERCIAL CLEANUP ACTION LEVEL AND CLEARANCE CRITERIA TECHNICAL MEMORANDUM

Once a property has met the current removal triggers all asbestos that is detectable by PLM is removed from the surface. There have been some properties where areas with visible vermiculite have been left in place because they were ND for LA by PLM. Given the data presented in Figure 1 and Table 2 earlier in this memo it would be prudent to modify these criteria. For properties that meet the current removal triggers it is proposed that EPA remove not only all levels of detectable LA by PLM from the surface of a property, but all visible vermiculite material as well. Beginning in October 2006 EPA has increased the vigor of the visual inspections done on properties (see Site-Specific Standard Operating Procedure for Semi-Quantitative Visual Estimation of Vermiculite in Soil, CDM 2006 in Site AR). It is hoped that this improved methodology will help aid in the delineation of LA bearing source materials. Also, beginning in October of 2006 EPA has improved the methodology for collecting soil samples

(going to 30-point composites instead of five point composites) to be analyzed by PLM. It is expected that combining these methods that EPA will provide EPA a much better field usable tool for guiding its cleanups. This change in approach will be vetted by the Indoor and Outdoor ABS programs discussed earlier in this Action Memorandum Amendment.

EPA Region 8 is currently putting together cleanup options and cost information for the specific remediation of Flower Creek. The options under evaluation range from a complete excavation of the impacted Creek banks to targeted removals of localized areas, to a cover in place approach.

Although the CVCC golf course is one of the properties identified through the Contaminant Screening Survey it is clearly an aberration from the more typical property cleanups done in Libby over the past five years. Given its size and scope, and the complexity of conducting an appropriate restoration on a public golf course, the CVCC work will be designed and implemented separately from the normal properties. If possible Region 8 would prefer to negotiate a cash-out settlement for its restoration with the CVCC owners.

Lastly, it is unknown at this time if additional work will be required at OU1, OU2, OU5, and OU6. However, given their current state, and planned future use, it is likely that additional Removal work will be required.

B. Contribution to remedial performance

The Site was made final on the NPL in October 2002. While cleanup at the Site continues to be conducted using removal authority, the Site was transitioned to the Region 8 Remedial Program after final listing on the NPL. This was due to the scope and complexity of the work, and to ensure consistency with the long term response action. Information and experience gained during the removal actions is used to continually refine the process and to plan for future work. Likewise, as more information is learned about the nature of the contamination and the risks presented, adjustments to the cleanup approach are made as necessary. The most contaminated properties are targeted first and, as discussed in Sections V and VI(A) of this Amendment, by taking steps such as removing all detectable asbestos and visible vermiculite from surface soils at those properties, EPA attempts to ensure that properties must only be cleaned once. This approach is protective as well as cost effective. It is expected that the cleanup approaches used during removal actions will be similar to, and consistent with, those used during remedial actions.

C. Description of alternative technologies

EPA attempts to employ the most appropriate technologies for addressing risks, but there are no known viable alternative technologies available at this time for addressing asbestos.

D. EE/CA

No EE/CA is required.

E. Applicable or relevant and appropriate requirements

See the Federal and State ARARs identified and/or discussed in the original Action Memorandum dated May 23, 2000.

F. Project Schedule

The total number of properties identified currently as requiring clean up (based on the December 2003 memo) including Troy is now estimated to be 1700, with 894 of those being completed as of October 2007. This leaves 806 properties on the "remaining to be cleaned" list. Of these 806, 506 are in the Libby area, with another 300 coming from Troy. Since the cleanup of residential/commercial properties began in earnest in 2003 (see Table 1) over the last 5 construction seasons the number of properties EPA has cleaned annually has ranged from 157 to 225. While the EPA has become more effective in conducting LA removals in Libby, as discussed earlier in this Action Memorandum Amendment EPA has seen an increase in the number of large properties in the Libby area. Very initial reviews of the properties in Troy that meet the current criteria suggest that there will be a mix of large and small properties. For planning purposes it is assumed that the funding for Libby will remain constant, with $17,000,000 a year available in Remedial Action (RA) funds for cleanup. Given all of this, if EPA averages 180 properties per year (160 is the target for 2008) the current set of properties will take 4.5 construction seasons. Thus, it is not expected that the current set of removals will be completed until the end of 2012.

Also, it is also unknown at this time how the Creeks and CVCC will be funded and scheduled. Again, if RA funding remains constant than these projects will either be done in lieu of, or after property cleanups. Either way they in effect will be scheduled is series instead of parallel. It is reasonable to assume that both of these projects, including restoration, will take a minimum of two years. If both are started at the middle of 2012 (when "normal" property cleanups will end) then it is safe to assume that the removal schedule will push into 2014. This date would be further extend if major work is required at OU1, OU2, OU5, and/or OU6.

It is worth noting that the exact total number of properties in and around Libby and Troy will not be known until publication of a ROD. Given the planned implementation of the LAP, as well as the needed exposure assessment work, a ROD for OU4 and OU7 is not expected until 2011. This, of course assumes that the LAP will remain on schedule, and the needed RI/FS and exposure assessment work is funded as needed. There is at a minimum a universe of 700 properties that will be affected by the outcome of this work. While a large percentage of the remaining properties have conditions described in the May 2002 Action Memo Amendment, cleanup using removal authority will continue only until publication of a ROD, at which time cleanup will continue using remedial authority. Remedial authority will then be used to clean up both classifications of properties: those that meet time critical removal action criteria but are not yet complete, and those that may meet future criteria established for remedial action. EPA may encounter situations in the future for which removal actions are appropriate, even after a ROD is published. EPA will also continue to prioritize cleanup of properties that meet time critical

removal action criteria. Region 8 expects that approximately 170-200 properties can be cleaned up per year at current funding levels. The overall project schedule is contingent upon funding and the total number of properties requiring cleanup, but based on current knowledge, the current funding situation, and the actual date of a ROD,

G. Estimated Costs

Given that a ROD for OU4 and OU7 is now targeted for 2011, this ceiling increase is designed to cover the costs projected to be needed to clean the 806 remaining properties that meet the current Removal criteria. Rough estimates have also been prepared to cover cleanup work for the Creeks, the CVCC, and potential work at OU1, OU2, OU5, and/or OU6. While the nature of cleanup has not fundamentally changed, the May 2002 Action Memorandum Amendment prepared by then OERR, underestimated the scope, complexity, and cost of cleanup, especially with regards to interior cleaning and the removal of vermiculite insulation. Likewise the two 2006 Action Memorandum Amendments anticipated that a ROD would sonn be forthcoming for the Site. Clearly, this expectation has not been realized, and will not be realized in the near future.

However, after five years of investigation and cleanup, Region 8 is able to more accurately forecast cleanup requirements, both on a per property basis and overall. Because of this increased accuracy, and for simplicity, this Amendment provides only a basic, cumulative breakout of the removal ceiling documented in the June, 2006 Action Memorandum Amendment and the proposed removal ceiling (Table 3).

Table 3. Proposed Removal Project Ceiling (current through 2014).

Category	Current Ceiling	Proposed Ceiling
Extramural Costs		
Property Cleanups (1700 total)	$90,769,000	$192,000,000
CVCC	$0	$ 2,500,000
Creeks	$0	$ 3,000,000
OU1, OU2, OU5, OU6	$0	$ 2,000,000
Extramural Sub Total	$90,769,000	$199,500,000
Intramural Costs	$ 1,068,000	$ 3,000,000
Sub Total	$91,837,000	$202,500,000
Contingency @ 20%	N/A	$ 40,500,000
TOTAL	**$91,837,000**	**$243,000,000**

As documented in the May 2006 Action Memorandum Amendment (and in previous Action Memoranda), the Libby Asbestos Site has major investigative expenditures that do not count against this Site ceiling. For clarity sake, these are summarized here. Please note that amounts are approximate. Also note that these estimates do not include prejudgment interest, indirect costs and potential enforcement and litigation costs (including Department of Justice costs). These costs are not counted against the removal ceiling either. Through 2006 these

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expenditures totaled approximate $25,800,000 (see May 2006 Action Memorandum Amendment). Below is a summary of the estimated costs for the Site moving forward, and not counting the LAP, which is funded separately by EPA Head Quarters.

Table 4. Summary of Ongoing Superfund Investigative (Pipeline) costs

Exposure/Efficacy Sampling				
Ambient Air Sampling[1]	$ 600,000.00	$700,000.00	$1,200,000.00	$1,300,000.00
Indoor ABS	$2,000,000.00	$1,500,000.00	$3,500,000.00	$3,500,000.00
Outdoor ABS	$2,000,000.00	$1,500,000.00	$3,000,000.00	$3,500,000.00
Worker/Fireman ABS	$0.00	$1,000,000.00	$0.00	$1,000,000.00
RI/FS Investigations				
Mine[2]	$610,000.00	$1,000,000.00	$7,500,000.00	$2,500,000.00
Troy	$1,000,000.00	$2,000,000.00	$3,000,000.00	$3,500,000.00
Processing Areas	$500,000.00	$500,000.00	$1,000,000.00	$1,200,000.00
Libby OU4[3]	$250,000.00	$550,000.00	$ 750,000.00	$1,000,000.00
BRA Suppport[4]	$0.00	$500,000.00	$0.00	$1,200,000.00
Pipeline Total	**$6,960,000.00**	**$9,250,000.00**	**$19,950,000.00**	**$18,700,000.00**

Notes:

1. Includes expansion to processing areas, highway 37 corridor, and rail corridor
2. Assumes Grace will do bulk of sampling, EPA will develop sampling plans and BRA
3. Includes assessment of Creeks and CVCC, as well as properties which have yet to be screened
4. Technical input for Site wide analytical, toxicological, statistical, and sampling strategy support

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action will result in continued public exposure to unsafe amounts of amphibole asbestos. This will increase the risk to public health and continue to burden an already impacted community.

VIII. OUTSTANDING POLICY ISSUES

There are no new policy issues or considerations.

IX. ENFORCEMENT

On March 30, 2001, the Department of Justice, on behalf of EPA, filed a lawsuit in the

District of Montana against W.R. Grace & Co. and related entities to recover costs EPA has and will incur as a result of the Libby Asbestos Site response action. On December 19, 2002 the district court ruled, among other things, that EPA's response activities at the site were not inconsistent with the NCP. On August 26,2003, the district court ordered W.R. Grace to reimburse EPA $54,527,081.11 for response costs EPA had incurred through December 31, 2001, and issued a declaratory judgment on liability for future response costs. (The district court later awarded an additional $3,742,453.87 in pre-judgment interest.) W.R. Grace appealed the district court's rulings regarding consistency with the NCP, the amount of costs incurred through December 31, 2001, and the declaratory judgment (But not the award of pre-judgment interest). On December 1, 2005, the Court of Appeals for the Ninth Circuit affirmed the district court judgment in full. It is not currently known whether W.R. Grace will seek additional judicial review of the district court judgment. It is important to note that W.R. Grace is currently reorganizing pursuant to Chapter 11 of the Bankruptcy Code. Any payment of the judgment awarded in this case will be made pursuant to a Plan of Reorganization approved by the Bankruptcy Court. The timing of approval of a Plan of Reorganization cannot be estimated at .this time.

X. RECOMMENDATION

This decision document represents the selected removal action for the removal of Libby asbestos sources from targeted homes, businesses, and public buildings at the Libby Asbestos Site in Lincoln County, Montana. The proposed removal actions have been developed in accordance with CERCLA as amended and are consistent with the NCP. The decision is based on the administrative record for the Site. Conditions at the Site continue to meet the NCP [40 CFR § 300.415(b)] criteria for a removal action. The NCP [40 CFR § 300.415(b)(5)(i)] and [40 CFR § 300.415(b)(5)(ii)] criteria for exemptions from the statutory limits that have been previously documented continue to exist. I recommend your formal approval of the proposed removal action ceiling increase.

Approve: _____ Date: _____

Susan P. Bodine,
Assistant Administrator
Office of Solid Waste and Emergency Response

Disapprove: _____ Date: _____

Susan P. Bodine,
Assistant Administrator
Office of Solid Waste and Emergency Response

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