



# Summary Report: Exposure to asbestos-containing vermiculite from Libby, Montana, at 28 processing sites in the United States

## What is the report about?

This report summarizes what the Agency for Toxic Substances and Disease Registry (ATSDR) and state health department partners learned during their evaluations of 28 sites that received asbestos-containing vermiculite from a mine in Libby, Montana. These 28 site evaluations focused on potential past, current, and future pathways of exposure to the asbestos associated with the Libby mine. Most of the processing facilities at these sites operated for different time periods in the past, during the 1920s to the early 1990s. The purpose of the report is (1) to summarize what we learned during detailed site evaluations, and (2) to provide recommendations that local, state, and federal agencies can use to address similar sites.

## Who should read the report?

ATSDR wrote the report for public health and environmental professionals involved with sites that received vermiculite from the Libby mine.

## Why did ATSDR conduct this work?

ATSDR began evaluating Libby-related vermiculite sites in response to documented asbestos-related health effects in Libby and at the request of the U.S. Environmental Protection Agency (EPA). By analyzing historical records, EPA identified 245 sites within the United States that may have received shipments of asbestos-containing vermiculite concentrate (VC) from the Libby mine.

The Libby mine operated from the 1920s to 1990. In 2002, ATSDR reported that asbestosis mortality rates in the Libby community were 40 to 80 times higher than expected and that lung cancer mortality was 20% to 30% higher than expected. Most of the asbestosis cases identified were either former employees of the Libby mine

and processing facilities or household contacts of these employees. A recently published study by scientists at the National Institute for Occupational Safety and Health (NIOSH) reported that asbestosis mortality among a cohort of 1,672 Libby vermiculite workers was 165 times higher than expected. The study also documented 15 mesothelioma deaths for this occupational cohort.

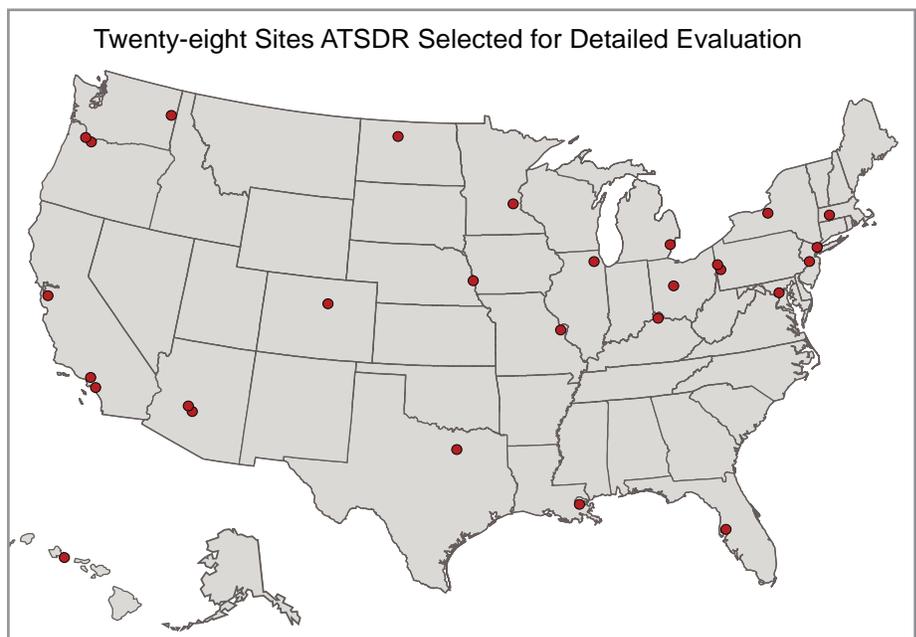
Health effects associated with breathing asbestos include non-cancer respiratory effects (such as asbestosis), mesothelioma (a rare type of cancer of the membrane that encases the lungs and lines body cavities), and lung cancer.

## How did ATSDR select the 28 sites for detailed study?

ATSDR selected sites for detailed evaluation on the basis of the following criteria: (1) EPA mandated further action at the site based upon contamination in place, or (2) the site processed more than 100,000 tons of VC from the Libby mine.

Twenty-seven of the 28 sites ATSDR examined were exfoliation facilities that processed vermiculite by heating it until it expanded or popped. ATSDR evaluated some of the 28 sites itself, while others were evaluated in collaboration with state health departments.

In the report, ATSDR uses the term asbestos to refer to all serpentine and amphibole minerals, including winchite and richterite, that are of health concern because they are known or suspected to be associated with asbestos-related diseases and conditions such as asbestosis, mesothelioma, lung cancer, and pleural abnormalities. The terms *amphiboles* and *Libby amphiboles* also are used in reference to the specific asbestos minerals characteristic of the Libby mine. *Vermiculite concentrate* (VC) refers to vermiculite that has been mined, cleaned, and milled into various sizes.



## What are ATSDR's findings from this work?

On the basis of the 28 site evaluations, ATSDR identified three groups of people who experienced significant exposure to Libby amphiboles in the past while these facilities actively exfoliated vermiculite: former employees, household contacts of former employees, and some community members who had frequent, direct contact with vermiculite or waste rock from the exfoliation process.

ATSDR also concluded that residual asbestos may be present in indoor settled dust and exterior soil at sites that exfoliated asbestos-containing vermiculite from Libby in the past. The report outlines recommendations for re-evaluating former vermiculite exfoliation sites where such residual asbestos may be present.

Within the report, ATSDR proposes important public health activities to increase awareness about exposure to asbestos associated with these types of sites.

For detailed conclusions and recommendations, refer to the Summary Report: Exposure to asbestos-containing vermiculite from Libby, Montana, at 28 processing sites in the United States, available at <http://www.atsdr.cdc.gov>.

## Who will implement the recommendations from this report?

The recommendations are intended as a general framework for follow-up activities. They may be implemented by many different entities, including site owners and local, state, and federal agencies. The number and variety of sites, stakeholders, public health and regulatory organizations, and jurisdictions involved suggest that a cooperative and flexible approach is necessary to effectively identify and implement follow-up actions appropriate for individual sites.

## What is ATSDR's role in implementing recommendations from this report?

ATSDR acts in an advisory, nonregulatory capacity, working with communities, environmental groups, and local, state, and other federal groups to protect public health. ATSDR's role in supporting the recommendations in this report will vary from providing technical assistance to participating in implementation. Senior ATSDR scientists are part of EPA's TRW Asbestos Committee, and ATSDR is committed to providing technical support on asbestos issues through this collaborative effort.

ATSDR has initiated or supported many activities to understand better the potential public health effects at sites that processed asbestos-containing vermiculite. Some of these activities include worker studies, community surveys and screenings, and disease-specific surveillance. These projects are progressing independently, and their findings will be published in separate reports.

## Where can I get a copy of the report?

You can read or download a copy of the Summary Report: Exposure to asbestos-containing vermiculite from Libby, Montana, at 28 processing sites in the United States from ATSDR's web site at <http://www.atsdr.cdc.gov>. This web site also has information about other ATSDR projects related to Libby, Montana, and information about asbestos exposure and health effects.

ATSDR previously published reports about each of the 28 sites. These detailed reports are available on the agency website at [www.atsdr.cdc.gov/asbestos/sites/national\\_map/](http://www.atsdr.cdc.gov/asbestos/sites/national_map/).



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## WHERE CAN I GO FOR MORE INFORMATION?

For more information on what federal agencies are doing related to asbestos, visit the following web sites.

**Agency for Toxic Substances and Disease Registry**  
<http://www.atsdr.cdc.gov>

**U.S. Environmental Protection Agency**  
<http://www.epa.gov/asbestos/>

**Centers for Disease Control and Prevention**  
<http://www.cdc.gov/health/asbestos.htm>

**U.S. Geological Survey**  
<http://health.usgs.gov/inhalation/asbestiform.html>