

## IRIS FINAL ASSESSMENT OF LIBBY AMPHIBOLE ASBESTOS (LAA)

### General Information

Libby Amphibole asbestos is a contaminant of vermiculite ore that was mined in Libby, Montana. Vermiculite is a silver-gold to gray-brown mineral that has been used as building insulation or as a soil amendment. Because asbestos fibers are so small, this contamination is not evident with the naked eye. Shipments of the asbestos-containing vermiculite were sent to processing sites across the United States.

LAA is a mixture of asbestos fibers in the amphibole mineral family. LAA is made up of very durable fibers that do not typically dissolve or break down. Fibers may remain airborne before settling into soil or sediment, although physical activity can disturb fibers allowing them to become airborne again.

### Exposure Information

Human exposure to Libby Amphibole asbestos is observed in the Libby, Montana region, at sites where the LAA contaminated vermiculite was processed, and at locations where it was used, including homes with insulation derived from Libby vermiculite. Inhalation of LAA is the route of exposure that is the primary concern for human health. When the mining and milling operations were active, residents of the Libby, Montana region were exposed to high ambient air concentrations of LAA. People in Libby, Montana may also have been exposed to LAA from residual fibers brought into a home on clothing, shoes or other materials from the work site.



Now that mining and milling operations have ceased, exposures could arise from soil at sites that processed asbestos-containing vermiculite from Libby in the past. Additionally, residents may also be exposed if they have unremediated soils with high concentrations of LAA.

### Health Effects Information and IRIS Assessment Findings

The IRIS assessment includes an estimate of the amount of Libby Amphibole asbestos that one can breathe every day for a lifetime that is likely to be without harmful health effects. This is known as an inhalation reference concentration, or RfC. Based on a principal study of occupational exposure from workers in Marysville, OH, the final assessment specifically evaluates a type of thickening of the pleura detectable on X-ray called “localized pleural thickening” (LPT). The pleura are membranes that envelop the lung. LPT is associated with decreased lung function. This will be the first such estimate regarding non-cancer effects for any type of asbestos.

This assessment concludes that LAA is “carcinogenic to humans” by the inhalation route of exposure and also includes an estimate of cancer risk from inhalation exposure to LAA. This is known as an inhalation unit risk, or IUR. The classification of LAA as carcinogenic to humans is based on strong evidence of cancer in humans from epidemiological studies.

### About the IRIS Program

EPA’s Integrated Risk Information System (IRIS) is a human health assessment program that evaluates scientific information on effects that may result from exposure to chemical substances in the environment.

Through IRIS, EPA provides science-based human health assessments to support regulatory activities and decisions to protect public health. The IRIS database contains crucial information on chemical substances that can be used to support the first two steps (hazard identification and dose-response assessment) of the human health risk assessment process. When supported by available data, IRIS provides health effects information and toxicity values for chronic health effects (including cancer and effects other than cancer). Government and others combine IRIS toxicity values with exposure information to help characterize public health risks of chemical substances; this information is then used to support risk management decisions designed to protect human health.

### Contact

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