

## Impact of Wildfires on Asbestos-Contaminated Areas Near Libby – Review of EPA Findings

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### At the request of the LATAG, the following EPA reports were reviewed (hereafter referred to as Reports 1-5):

1. Technical Memo. Libby Superfund Site OU3 Burn Chamber Studies Summary (no date).
2. EPA Technical Memorandum. Subject: Simulation of Forest Fire Combustion of Amphibole Contaminated Biomass with Resultant Health Risk Assessment for Residents of Libby, Montana (8/30/2012).
3. EPA Evaluation of Impacts of Forest Fires That Occur in Operable Unit 3 on Air and Soil in Libby (7/9/13).
4. EPA Evaluation of Exposure to Firefighters in Operable Unit 3 (8/5/2013).
5. Detailed TEM Results for Air Samples Collected During the Souse Gulch Wildfire (8/5/2013).

### Report Reviews:

**Report 1:** This EPA report summarizes the studies carried out that measured the amount of Libby-Amphibole (LA) released from burning duff into smoke.

- Studies were performed at EPA's Open Burn Test Facility (OBTF) located in Research Triangle Park (RTP), North Carolina.
- These studies were focused only on LA-contaminated duff. As presented in the EPA report: *"The source materials most likely to release LA to air during a fire in OU3 are duff and bark. During an authentic wildfire, the principal material that is burned is duff and small woody debris, while bark on large standing trees (the likely primary location of embedded LA fibers) is usually only charred. In addition, available data collected during the Phase I investigation (EPA 2007) indicate that the levels of LA (mass per unit mass) are likely to be much higher in duff than in bark. Thus, it is considered likely that the main source of LA release to air during a fire will be duff. For this reason, the burn studies reported here utilized duff as the burn material."* Given that trees and soil also contain elevated levels of LA in/near OU3, I believe it should be considered that LA fibers from these sources would be liberated into the ambient air / smoke plume during a catastrophic wildfire.
- *"In the chamber studies, the material was fed at a rate such that about 10 pounds of duff were burned over a one hour interval. During the fire, a fan blew air into the burn hut, and the exhaust smoke from the burning material traveled through an exhaust flue where sampling for LA and particulate matter was performed."* Since the combustion chamber burn conditions are dramatically different than those observed during wildland forest fires, I do not believe that results generated using the chamber studies are representative of wildfire conditions.
- The report cites Ward et al. (2009) in regards to LA fibers remaining in the ash following combustion. However, the Ward et al. (2009) study was conducted using a residential stove that burned firewood under "normal" operating parameters. It is important to differentiate these published findings (using a residential wood stove) with what would occur during a catastrophic wildfire in/near OU3.

**Report 2:** This technical memorandum summarizes data and analysis that estimates asbestos air concentrations that may occur as a result of a forest fire in OU3. Results from this report were based on results of the *Report 1 chamber study*. Two scenarios were used (simulation of smoldering and flaming conditions) in the trials, resulting in the development of human health cancer risks and cancer hazard estimates. Final conclusions state that *"Whether fires occur at a frequency of one every 70 years or two fires every 70 years at the vermiculite*

*mine site, both cancer risks and noncancer hazards are found to be below EPA targets.*” My specific questions in regards to this report include:

- Why only focus on duff? Soil and trees are also contaminated within OU3.
- How can burning duff in a controlled environment in a “burn chamber” be representative of actual forest fire conditions?
- What exactly does “below EPA targets” mean? How does this translate to “how safe is Libby” during a forest fire?

**Report 3:** This memo describes studies and calculations performed by EPA to estimate potential LA exposures to residents in Libby associated with forest fires in OU3. Results summarized from this memo state that “...EPA has determined that exposures and health risks to residents in Libby are likely to be low, both from direct inhalation of fibers in air and by deposition of fibers to soil.” My specific questions regarding this report include:

- Why only focus on duff? Soil and trees are also contaminated within OU3.
- How can burning duff in a controlled environment in a “burn chamber” be representative of actual forest fire conditions? The burn chamber study would generate non-representative results that would then serve as inputs for the predictive models. Thus, the model results and overall conclusions come into question.
- Were US Forest Service personnel and wildfire experts consulted on this study?
- Are “lifetime risks” applicable in this scenario, when there would potentially be significant exposures over short periods of time?
- What about the periods of time following the wildfire, and potential for contaminated runoff, erosion, windblown ash, etc.? Wind dispersal of the ash as well as erosion processes from the burned areas would introduce two new potential exposure pathways following the wildfire event.

**Report 4:** This memo describes calculations performed by the EPA to estimate potential LA exposures to firefighters in OU3. EPA concludes that “*Estimated exposure of firefighters in OU3 to LA in smoke might exceed the OSHA standard for short times under worst case or high-end conditions, but typical short term and long term exposures are likely to be within OSHA limits.*” My specific questions to this report include:

- Again, duff (only) was used in the EPA burn chamber, as “...nearly all LA released during a fire is expected to come from duff.”
- The findings of this study “...represents only exposures associated with LA in smoke and does not include other firefighting activities...”.
- Were US Forest Service personnel and wildfire experts consulted on this study?
- How would other firefighting activities, such as creating firelines, hiking through contaminated areas, etc. contribute to total exposures?

**Report 5:** On July 28, 2013, a small fire in the Souse Gulch day-use area on Lake Koocanusa burned ~1.5 acres. Air samples were collected during the fire, including firefighter activity-based sampling (ABS, n=16), a mobile monitor which ran for 241 minutes, a Libby Airport Helo (62 min sample), and from the McGillivray campground (1440 minutes). Transmission Electron Microscopy (TEM) results showed that only 2 of 16 ABS samples measured LA, with results near the sensitivity levels of the analysis. No LA were measured in any of the other air samples that were collected.

- These samples provide initial “real-world” information regarding potential exposures that might occur during a wildfire event. However, the size, duration, and intensity of the Souse Gulch fire do not directly compare to what would occur during a significant wildfire event in OU3.
- It is not known what the LA content of the duff/soil/tree bark were that burned during the Souse Gulch fire.
- No information on sampling or analytical methodologies are provided with the table, making it hard to evaluate the quality of the findings.

**Overall Summary:** In summary, I believe the EPA reports are a good “first step” in addressing the potential exposures associated with a wildfire within OU3. However, I have several concerns with the overall study design and final conclusions reached by EPA. Primarily is the fact that only duff was used in the combustion chamber study, of which the “emission factor” results (for both PM<sub>2.5</sub> and LA) were used as model inputs in subsequent studies to determine the potential exposures to the Libby valley as well as firefighters. It is my opinion that the combustion chamber studies do not reflect the LA (and PM<sub>2.5</sub>) emissions that would occur during a major wildfire event. I cannot definitively say that LA exposures would occur to the public and to firefighters during such an event. However, I believe it is misleading for EPA to suggest that insignificant exposures are predicted based on the limited modeling studies conducted by EPA to date.

**Next Steps:** EPA’s Community Engagement Plan identifies wildfires in asbestos-contaminated areas as one of four top community concerns. While EPA has addressed the wildfire issue through a chamber study as well collecting air samples during the Souse Gulch Wildfire, the technical advisors do not believe there is adequate information to derive a well-informed public health statement about potential risks. Moreover, we are not aware of any near-term agency plans to further investigate, disseminate initial findings, or provide further interpretation of findings to the Libby community.

As next steps, the TAG advisors (as directed by the TAG) could work on the following tasks related to regional wildfires:

1. Facilitate a workshop with agency stakeholders (e.g. Lincoln County, USFS, DNRC, DEQ, EPA, etc.) to identify current gaps in the knowledge, and identify a strategy to communicate existing findings to the public (e.g. TAG web site, coordination with county health department, etc.).
2. Based on the findings of the report reviews and workshop, assist EPA and the Lincoln County Asbestos Resource Program to generate a fact-sheet for the Libby public on what do to should a significant wildfire impact the surrounding areas.