

Letter Health Consultation

Evaluation of Activity-based Sampling Results from Camp Moshava at

MINEFIELDS ASBESTOS SITE

STREET, MARYLAND

JULY 12, 2012

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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STREET, MARYLAND

Prepared By:

Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Eastern Branch



Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

July 12, 2012

Mr. Jack Kelly
On Scene Coordinator
Removal Response Program (Mail Code 3HS31)
USEPA - Region 3
1650 Arch Street
Philadelphia, PA 19103-2029

RE: Evaluation of Activity-based Sampling Results from Camp Moshava at Minefields Asbestos Site in Maryland

Dear Mr. Kelly:

Thank you for consulting with the Agency for Toxic Substances and Disease Registry (ATSDR) regarding public health aspects of the U.S. Environmental Protection Agency's (EPA's) sampling activities at Camp Moshava. This camp is associated with the Minefields Asbestos site, near Street, Maryland. I am writing to provide ATSDR's public health conclusions regarding the results of EPA's April 2012 activity-based sampling (ABS) and soil sampling for asbestos at the camp.

To summarize our findings, *the results indicate that asbestos exposures at the camp are below levels of health concern. No special precautions are needed during any camp activities.* We understand some previously undeveloped areas may be developed in the future. Because the general area around the camp may contain deposits of asbestos, we recommend that any future construction plans recognize this potential and plan accordingly.

Background

Camp Moshava has operated on this 262-acre site since 1985.¹ In the late 1800s and early 1900s, an active mine operated on a portion of the site, producing talc, asbestos, and chromium. The US Geological Survey identified the site as one of 22 asbestos occurrences, former mines, or former prospects in Maryland.² The former mine workings are largely overgrown, and the former mine pit, dammed by an area of tailings, has filled with water to form a pond used for swimming activities. The pond and former mine are a quarter of a mile or more from the main camp area.

¹ Weston Solutions Inc. Final field sampling plan, site evaluation, Minefields Asbestos site, Street, Harford County, Maryland. West Chester: Weston Solutions. Prepared for the U.S. Environmental Protection Agency, Region 3. April 2012.

² Van Gosen BS. Reported historic asbestos mines, historic asbestos prospects, and natural asbestos occurrences in the eastern United States. U.S. Geological Survey Open-File Report 2005-1189. Version, 2.0, posted March 2006. Available at: <http://pubs.usgs.gov/of/2005/1189/>.

The Minefields Asbestos site was prioritized for investigation by the Maryland Department of the Environment (MDE) as part of a Naturally Occurring Asbestos (NOA) Initiative that began in 2009. In 2010 MDE collected surface soil, surface water, sediment, and groundwater samples in the areas of the former mine operations and the tailings pile at the site and analyzed them for metals and asbestos.³ Trace levels (<0.25%) of asbestos were reported in a few soil samples from the tailings area. The asbestos analysis method used and laboratory data sheets were not available.

Activities that disturb soil containing trace levels of asbestos can sometimes result in airborne asbestos concentrations of health concern.⁴ ATSDR typically recommends ABS to characterize actual exposures for representative activities taking place in locations where trace levels of asbestos in soil exist. However, few, if any, activities take place on the tailings pile where trace levels were found.

Despite these considerations, ATSDR felt additional characterization of the camp was needed. We have observed that tailings are often transported to other areas for use as fill, and the camp is close to a former asbestos mine. This suggested that trace levels of asbestos could also exist in the main camp area. To better characterize the potential risk to campers, ATSDR recommended additional soil samples be collected and ABS be conducted in high-use or bare areas in the main camp area. ATSDR worked with the EPA Region 3 Removal Program as they planned this sampling effort.

Summary of EPA Sampling and Results

EPA conducted sampling at Camp Moshava on April 9 and 10, 2012. For ABS, contractors wearing personal air monitors conducted activities in defined areas of the camp. The personal air monitor collects a volume of air through a filter; asbestos structures are trapped by the filter for later counting. The monitor collects air from the breathing zone of the person doing the activity, so it closely represents actual exposures. Three 120-minute long activities were conducted for the ABS; for each ABS activity duplicate samples were collected.

- ABS #1 represented playing baseball or Frisbee in the field area
- ABS #2 represented walking, hiking, or running in the cabin area
- ABS #3 represented walking or driving a vehicle through the open main camp area

³ Maryland Department of the Environment. Site inspection of the Mine Fields NOA site (MD-583). Baltimore: Maryland Department of the Environment. December 6, 2011.

⁴ See, for example, U.S. Environmental Protection Agency. El Dorado Hills naturally occurring asbestos multimedia exposure assessment final preliminary assessment and site inspection report. San Francisco: U.S. Environmental Protection Agency, Region 9; 2006 or Weis CP. Memo to P. Peronard of U.S. Environmental Protection Agency RE: Amphibole mineral fibers in source materials in residential and commercial areas of Libby pose an imminent and substantial endangerment to public health. Denver: U.S. Environmental Protection Agency, Region 8, December 20, 2001.

While these activities were conducted, a stationary monitor collected air from a location removed from the immediate activity to represent “background” or “bystander” exposures. This type of monitor collects a greater volume of air, so it can achieve a greater sensitivity for asbestos detection. Table 1 summarizes air sample results for phase contrast microscopy equivalent (PCMe) asbestos structures per cubic centimeter of air (s/cc) found during the sampling. PCMe refers to a size fraction of asbestos structures that has been historically used as an index of asbestos exposure. Most asbestos health and risk assessment information is based on PCMe.

Table 1. Summary of Activity-Based and Perimeter Air Sample Results from EPA Sampling at Camp Moshava, Minefields Asbestos Site, April 10, 2012

Sample	Result – Duplicate #1	Result – Duplicate #2	Average Used in Calculations
ABS #1 Playing Baseball or Frisbee in Field Area	0.00099 s/cc	0.001 s/cc	0.000995 s/cc
ABS #2 Walking or Hiking in Cabin Area	Not Detected (<0.008 s/cc)	Not Detected (<0.00099 s/cc)	N/A
ABS #3 Walking or Driving Auto in Open Area of Camp	0.00096 s/cc	0.0019 s/cc	0.00143 s/cc
Perimeter	Not Detected (<0.00038 s/cc)	Not Detected (<0.00039 s/cc)	N/A
<p>Notes: Results are given in units of phase contrast microscopy equivalent (PCMe) asbestos structures per cubic centimeter (s/cc) as measured with the ISO 10312 method. PCMe structures include asbestos individual fibers, clusters of fibers, and fibers associated with matrices of other minerals longer than 5 microns, between 0.25 and 3 microns in width, and with a length:width ratio of 3 or greater. N/A = Not Applicable.</p>			

EPA also collected 11 surface soil (0-2 inches below ground surface) samples to determine the asbestos content of soil in the camp area. Eight of the 11 surface soil samples had no asbestos fibers detected, and 3 had trace levels (less than 0.25%) of chrysotile asbestos.⁵ These findings suggest that there is not a major health concern relating to asbestos at the camp. However, because even trace levels of asbestos can result in airborne asbestos levels of concern in some situations, an evaluation of the activity-based sampling results is needed.

Evaluation of Potential Risk

To estimate potential risk from activities at the camp, ATSDR assumed that the “worst case” would apply to a camp counselor who also attended the camp as a child. Based on general information about the camp, we conservatively assumed 2 hours of exposure every day to each of the 3 activities represented by ABS, for 1 month a year from ages 6 to 17 and for 3 months per

⁵ Soil samples were analyzed with EPA 600/R-93/116 method, PLM analysis with CARB 435 Prep Level A.

year from ages 18 to 25. (Only ABS scenarios #1 and #3 contribute to risk, because no asbestos structures were detected in the ABS scenario #2.)

To estimate potential risk posed by this exposure, ATSDR followed EPA's Framework for Investigating Asbestos-contaminated Superfund Sites.⁶ This document specifies unit risk values for given ages at onset and exposure durations to asbestos. The increased theoretical cancer risk is given by this unit risk times the asbestos concentration for a given activity (given in PCMe s/cc) times a time-weighting factor that describes the fraction of time over the exposure duration that the particular activity is performed.

For ATSDR's analysis, we combined the activity asbestos concentration and time-weighting factor terms to calculate an "average asbestos exposure concentration," which is then multiplied by the unit risk to determine the increased risk of cancer. The calculations are detailed below for the two general age ranges considered:

Ages 6 through 17 (Camper Exposure Scenario):

Age at onset: 6 Exposure Duration: 12 years Unit Risk: 0.077 (s/cc)⁻¹

Average Exposure Concentration:

$$\left(0.000995 \frac{s}{cc} \times \frac{2 \text{ hr}}{24 \text{ hr}} \times \frac{1 \text{ month}}{12 \text{ months}}\right) + \left(0.00143 \frac{s}{cc} \times \frac{2 \text{ hr}}{24 \text{ hr}} \times \frac{1 \text{ month}}{12 \text{ months}}\right) \\ = 0.0000168 \text{ s/cc}$$

Ages 18 through 25 (Counselor Exposure Scenario):

Age at onset: 18 Exposure Duration: 8 years Unit Risk: 0.035 (s/cc)⁻¹

Average Exposure Concentration:

$$\left(0.000995 \frac{s}{cc} \times \frac{2 \text{ hr}}{24 \text{ hr}} \times \frac{3 \text{ months}}{12 \text{ months}}\right) + \left(0.00143 \frac{s}{cc} \times \frac{2 \text{ hr}}{24 \text{ hr}} \times \frac{3 \text{ months}}{12 \text{ months}}\right) \\ = 0.0000505 \text{ s/cc}$$

The total excess lifetime cancer risk associated with this exposure is given by total sum of the unit risk for each time period multiplied by the average exposure concentration for the time period.

⁶ U.S. Environmental Protection Agency. Framework for investigating asbestos-contaminated Superfund sites. Washington, DC: U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Prepared by the Asbestos Committee of the Technical Review Workgroup. OSWER Directive #9200.0-68, September 2008.

Mr. Jack Kelly – Page 5

$$\begin{aligned} \text{Total Risk} &= (0.077(s/cc)^{-1} \times 0.0000168 s/cc) + (0.035(s/cc)^{-1} \times 0.0000505 s/cc) \\ &= 0.0000031 = 3.1 \times 10^{-6}, \text{ or 3 in one million.} \end{aligned}$$

This risk is well within EPA's acceptable risk range for Superfund of 1 in a million to 1 in 10,000 (1×10^{-6} to 1×10^{-4}). These calculations indicate that activities at the camp do not contribute an appreciable lifetime risk of cancer from asbestos exposure to children or adults at the Minefields site.

Also supporting this conclusion are perimeter sample results indicating that no asbestos was detected away from activities. Background or bystander exposures do not contribute significantly to risk.

Conclusions and Recommendations

- Activity-based sampling results indicate that asbestos exposures at the camp are below levels of health concern. No special precautions are needed during any camp activities.
- Because the general area around the camp may contain deposits of asbestos, we recommend that any future construction or development plans recognize this potential and plan accordingly.

Thank you for including ATSDR in your site work. Please do not hesitate to contact me if you have any questions or concerns. I can be reached at (770) 488-0768 or by email at JDyken@cdc.gov.

Sincerely,

[signed]

Jill J. Dyken, PhD, PE
Environmental Health Scientist
Eastern Branch
Division of Community Health Investigations (proposed)

cc:
Lora Werner, ATSDR Region 3