CSWAB

Citizens for Safe Water Around Badger
E12629 Weigand's Bay South - Merrimac, WI 53561
Phone (608) 643-3124 - Fax (608) 643-0005
Email: info@cswab.org - Website: www.cswab.org

June 20, 2012

Mark Davis, Air Management Specialist
Wisconsin Department of Natural Resources
PO Box 7921
Madison WI 53707-7921

SENT BY ELECTRONIC MAIL

RE: Petition for Assessment of Asbestos Exposure Pathways at Badger AAP

Dear Mr. Davis,

In order to evaluate whether a complete human exposure pathway exists under current or reasonably anticipated future site conditions, we are petitioning the Wisconsin Department of Natural Resources (WDNR) to require the development of a conceptual site model and the performance of an exposure pathway assessment for asbestos in surface and subsurface soils on current and former Badger Army Ammunition Plant (Badger) lands as consistent with the National Contingency Plan, existing Superfund guidance and recommendations from the U.S. Environmental Protection Agency (EPA).[1]

This assessment should involve the collection of polarized light microscopy (PLM) soil data.[2] Such analysis has not been conducted at Badger as the WDNR has not required laboratory analysis of soils for asbestos.[3] However, the Department of Defense has conducted such testing at other Army facilities:

- At the Radford Army Ammunition Plant in Virginia, asbestos fiber analysis of soils by PLM was conducted in order to complete the evaluation of health risks for asbestos in soil.[4]

[1] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, page 12, September 2008.
[2] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, page 12, September 2008.
[3] Joan Kenney, U.S. Army, Badger Army Ammunition Plant, Badger Oversight Mangement Commission meeting, verbal report, January 21, 2010.
[4] U.S. Army Corps of Engineers, Draft Supplemental Remedial Investigation Work Plan: New River Unit – RFAAP-NRU, Radford Army Ammunition Plant, June 2009.

- At the Ravenna Arm Ammunition Plant in Ohio, soil samples were collected at range firing pad sites to characterize the floor and sidewalls of soil excavations in order to confirm that all asbestos-containing material was removed. The remedial action work plan for the Winklepeck Burning Grounds required that asbestos samples be forwarded to an off-site laboratory for asbestos analysis using PLM.[5]

- At the Seneca Army Depot in New York State, all surface soil samples were analyzed for bulk asbestos by PLM.[6]

A combination of soil, dust, and air samples is further requested to characterize potential exposures, as consistent with U.S. EPA recommendations.[7]

Assessment should be inclusive of populations at risk including workers, on-site personnel, nearby residents, children and expectant mothers, agricultural workers, prairie restoration and prescribed burn participants, hunters, and recreational users.

In addition, we are requesting a summary of asbestos sampling results for stormwater and wastewater from Badger Army Ammunition Plant and/or the Bluffview Sanitary District as consistent with applicable WPDES permit requirements.

Typical exposure pathways for asbestos include inhalation of asbestos fibers released from disturbed soil or disturbed settled dust. U.S. EPA guidance stipulates that evaluation of potential future risks should be always be based on an assessment of reasonably anticipated changes in land use.[8] Current and potential future accessibility of the site, as well as community awareness of exposure to potential hazards at the site, are also factors that may be considered.[9]

Asbestos fibers can enter the air or water from the breakdown of natural deposits and manufactured asbestos products.[10] Sites contaminated by asbestos may present hazards to the public or to grazing animals. Asbestos on a site, especially if dispersed, is also likely to cause problems with reclamation or reuse of the land.[11]

Unlike most minerals, which turn into dust particles when crushed, asbestos breaks up into fine fibers that are too small to be seen by the human eye.[12] Exposure to asbestos has been

---

[5] U.S. Army Corps of Engineers, Winklepeck Burning Grounds, Ravenna Army Ammunition Plant, Ravenna, Ohio, Final Remedial Action Work Plan, page 3-14, 25 July 2008.
[6] U.S. Environmental Protection Agency, EPA Superfund Record of Decision, Seneca Army Depot, Romulus, NY, 28 July 2005.
[7] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, Executive Summary, September 2008.
[8] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, page 7, September 2008.
[9] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, Appendix D, September 2008.
[10] U.S. Agency for Toxic Substances and Disease Registry, ToxFAQs™ for Asbestos, September 2001.
[11] Inter-Departmental Committee on the Redevelopment of Contaminated Land (ICRCL), Asbestos on contaminated sites, 1990.
[12] U.S. Environmental Protection Agency, Region 4, The Asbestos Informer, accessed on line at http://www.epa.gov/region4/air/asbestos/inform.htm

associated with lung cancer, mesothelioma, and other cancers, as well as asbestosis and other nonmalignant respiratory diseases.[13] However, the toxicity of a given asbestos fiber depends on a number of other variables as well, including chemical composition, fiber shape, and fiber size.[14]

Asbestos fibers occur in air as the result of the disturbance of outdoor soil by forces such as wind, weathering, or human activities. Raking is an example of an anticipated human activity which EPA considers an aggressive (high-end) soil disturbance that is likely to result in the release of asbestos to the air.[15] Raking is a reasonably anticipated activity associated with prairie restoration, seeding, agriculture, recreation, reclamation, and grazing.

It is important to recognize that the releasability of asbestos from soils may change over time. For example, at certain sites asbestos in soil may exist primarily as large particles (i.e., large "chunks" of ACM[16] or large lumps) which tend to have low releasability of respirable asbestos fibers. Over time, however, these large non-respirable materials may become broken down by weathering and/or human activities thereby increasing the fraction of the readily releasable fibers without altering the amount of asbestos that is present.[17]

In addition to human health risks, asbestos in soils is a potential pathway for wildlife and livestock. An analysis of environmental exposures to two forms of asbestos in soil caused pleural plaques and mesothelioma in goats. Adult goats grazing in northeast Corsica inhaled asbestos fibers and the exposure resulted in detectable chrysotile and tremolite fiber loads in the lung and parietal pleura (a membrane that lines the inner chest walls and covers the diaphragm). Tremolite fibers of dimensions with a high carcinogenic potency were detected in the parietal pleura.[18] In laboratory animal studies, histological signs of tissue injury can be detected at the site of deposited fibers within a few days. In humans, measurable abnormalities of lung function do not usually appear for a number of years.[19]

The presence of asbestos in soil may preclude human activities that necessitate subsequent excavation for any purpose such as playing fields, parks and amenity areas. Such sites should not be used for gardens, allotments or agricultural uses in which digging, plowing or under-drainage may be involved; grazing land may also be subject to disturbance by plowing for reseeding.[20] In areas where humans are excluded, livestock, burrowing animals, and grazing wildlife such as deer may be expected to cause site disturbance.

---

[13] 73 FR 11284, Mine Safety and Health Administration, Asbestos Exposure Limit Rule, February 29, 2008.
[14] Anthony Perry, National Network of Environmental Management Studies Fellow, U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response Office of Superfund Remediation and Technology Innovation Technology Innovation Program Washington, DC, A Discussion of Asbestos Detection Techniques for Air and Soil, Prepared by for www.clu-in.org, August 2004.
[15] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, pages 7-8, September 2008.
[16] ACM is an acronym for Asbestos Containing Material.
[17] U.S. Environmental Protection Agency, Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68, pages 7-8, September 2008.
[18] Dumortier P, Rey F, Viallat JR, Broucke I, Boutin C, De Vuyst P., Chrysotile and tremolite asbestos fibres in the lungs and parietal pleura of Corsican goats, February 13, 2002.
[19] U.S. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Asbestos, September 2001.
[20] Inter-Departmental Committee on the Redevelopment of Contaminated Land (ICRCL), Asbestos on contaminated sites, page 8, 1990.

In 2004, the U.S. EPA Office of Superfund Remediation and Technology Innovation issued a memo clarifying that agency regions should develop risk-based, site-specific action levels to determine if response actions should be taken when materials containing less than 1 percent asbestos (including chrysotile and amphibole asbestos) are found on a site. Data from the Libby site and other sites provide evidence that soil/debris containing significantly less than 1 percent asbestos can release unacceptable air concentrations of all types of asbestos fibers (i.e., serpentine/chrysotile and amphibole/tremolite).[21]

The most critical determining factors in the level of airborne concentrations are the degree of disturbance which is associated with the level of activity occurring on the site and the presence of complete exposure pathways. For example, activities such as excavation or plowing generate large amounts of dust that can result in the generation of airborne fibers that can be inhaled even from a complex soil matrix.[22]

As the Department is aware, current and anticipated future land use activities at Badger includes agriculture, grazing, public recreation, ecological restoration, plant nurseries and seed planting, and many other uses that have the potential for land disturbance.

According to attorneys with the Marten Law Group, property which was part of the former Lowry Air Force Base in Colorado and was initially sold to the Lowry Redevelopment Authority (RLA) pursuant to the Defense Base Closure and Realignment Act. After the LRA demolished the buildings on the property and removed much of military's infrastructure, the LRA conveyed the property to residential home builders. In 2003, the Colorado Department of Public Health and the Environment issued a compliance advisory to the Air Force, the LRA, and the developers, citing discoveries of asbestos contamination in the soil. In order to avoid an enforcement action, the LRA and developers accepted a state-drafted response plan and began investigation and remediation. Both the LRA and the home builders incurred considerable expenses in removing contaminated soil from the property, including costs associated with investigation and remediation, including attorneys' fees, homeowner expenses and unabsorbed overhead.

Asbestos is a common soil contaminant at military installations nationwide. Examples include Letterkenny Army Depot (PA), Lexington-Blue Grass Army Depot (KY), Fort George Mead (MD), Fort Ritchie (MD), Fort Wingate (NM), Hingham Annex (MA), Military Ocean Terminal (NJ), Rocky Mountain Arsenal (CO), Stratford Army Engine Plant (CT), Sudbury Training Annex (MA), Sunflower Army Ammunition Plant (KS), Barbers Point Naval Air Station (HI), and Alabama Army Ammunition Plant.[23,24]

---

[21] U.S. Environmental Protection Agency, Washington DC, Office of Superfund Remediation and Technology Innovation, Memorandum: Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups, August 10, 2004.
[22] U.S. Environmental Protection Agency, Washington DC, Office of Superfund Remediation and Technology Innovation, Memorandum: Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups, August 10, 2004.
[23] National Research Council, Committee on Source Removal of Contaminants in the Subsurface, Contaminants in the Subsurface: Source Zone Assessment and Remediation, Tables A-1 and A-2, 2004.
[24] U.S. Army Environmental Center, Base Closure Division, Aberdeen Proving Grounds, Site Management Plan: Alabama Army Ammunition Plant, May 10, 1995.

When Badger Army Ammunition Plant was constructed, asbestos was a building material that was used to insulate pipes and boilers, as fire resistant roofing and siding, as static resistant flooring, and for pipe gaskets.[25] In 1996, samples of siding, floor tiles, and insulation analyzed by polarized light microscopy contained as much as 25% Amosite Asbestos and 30% Chrysotile Asbestos.

In 1988, Badger conducted a facility-wide friable asbestos survey. This study was used to fund projects to remove all friable asbestos from the part of Badger not required for production mobilization. This included about half of the 1,400 buildings on the plant site. The work was 99% complete as of December 1996. Required production buildings retained all of their original friable asbestos pipe and boiler insulation. [26]

In 2005, a survey by the USDA Forest Products Laboratory found that almost all of the buildings at Badger had transite (asbestos and Portland cement composite) as a siding material, and many had transite interior wall covering. Building interiors contained asbestos cement board and friable asbestos pipe insulation.[27] Since that time, most of the buildings and infrastructure at Badger have been demolished or deconstructed.

The WDNR has reviewed site closure requests for land parcels at Badger including Parcel O3 Post-Demolition Site Sauk County (09-57-555782), a parcel proposed for transfer to the Ho-Chunk Nation. Three buildings were demolished and soil testing was conducted to determine in the demolition process or previous activities had left any soil contamination. According to WDNR records, surface soil samples were tested for SVOCs, RCRA metals, DNT, PCBs, nitrocellulose and nitroglycerine. However, analysis for asbestos was limited to "visual evidence". Subsurface soil analysis did not include asbestos. Based on the results of this sampling effort, no further action was required by the WDNR.

Parcel O3 is just one example of a facility-wide approach to an asbestos management practice that appears to be wholly reliant on visual evidence. U.S. Army officials at Badger Army Ammunition Plant have confirmed that the facility is only required to remove friable asbestos materials that are "visible to the naked eye".[28]

This reliance on visual inspection as a measure of risk posed by asbestos in soil is not only inconsistent with federal regulations and guidelines, it is not compliant with Army regulations. Pursuant to Army environmental regulation 200-1, Army installations are required to minimize asbestos releases to the utmost extent possible, perform an exposure assessment and risk assessment for all locations containing asbestos, and assess the relative

---

[25] U.S. Army/Olin Corporation, Infrastructure Remedial Environmental Study, Badger Army Ammunition Plant, Volume I of III, page 11, December 1996.
[26] U.S. Army/Olin Corporation, Infrastructure Remedial Environmental Study, Badger Army Ammunition Plant, Volume I of III, page 11, December 1996.
[27] Falk, Robert H. 2005. Feasibility of using building deconstruction at Wisconsin's Badger Army Ammunition Plant: Salvaging lumber for reuse in low-income home construction. Gen. Tech. Rep. FPL-GTR-161. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.
[28] Joan Kenney, U.S. Army, Badger Army Ammunition Plant, Badger Oversight Mangement Commission meeting, verbal report, January 21, 2010.

health risks for alternative control actions.[29] The regulation further stipulates that the objective of the Army's Asbestos Management Program is to prevent human exposure to asbestos hazards on Army-owned or leased properties through proactive policies which comply with all applicable laws and regulations.[30] The program applies equally to friable and non-friable asbestos-containing materials.

Thank you in advance for your time and careful consideration of our requests and recommendations.

Sincerely,

Laura Olah
Executive Director

Attached: Photographs of partially demolished buildings at Badger Army Ammunition Plant with significant disturbance of asbestos-containing materials (2005).

[29] Army Regulation 200–1, Environmental Quality: Environmental Protection and Enhancement Headquarters, Department of the Army, Washington, DC, Chapter 8: Asbestos Management, pages 14-15, 21 February 1997.
[30] Army Regulation 200–1, Environmental Quality: Environmental Protection and Enhancement Headquarters, Department of the Army, Washington, DC, Chapter 8: Asbestos Management, pages 14-15, 21 February 1997.