



Missouri Department of Health and Senior Services

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Jane Drummond
Director



Matt Blunt
Governor

November 5, 2007

Cinnamon Square Homeowner's Association
Mr. Alan Stone, President
3864 E. Country Place
Springfield, MO 65809

Dear Mr. Stone:

The Missouri Department of Natural Resources (MDNR) is investigating the eastern part of Greene County, Missouri for lead contamination associated with past mining activities in this area. This letter is in response to MDNR's request to the Missouri Department of Health and Senior Services (DHSS) to provide you with health information on the lead sampling results they found within your subdivision. During this investigation, MDNR discovered elevated levels of lead in the Cinnamon Square Commons, north of Blueridge Street and south of Cinnamon Place, within the Cinnamon Square subdivision (See Figure 1). DHSS works with MDNR and the federal Agency for Toxic Substances and Disease Registry (ATSDR) throughout the state to provide health information and recommendations to individuals and communities living near formerly mined areas such as this.

On April 17, 2007, MDNR analyzed samples from the Cinnamon Square Commons area using an X-ray fluorescence instrument (XRF), and detected levels of lead as high as 3,003 parts per million (ppm) around the old milling area (See Figure 2). These levels were later confirmed by laboratory analyses that found lead levels as high as 3,337 ppm (1). In general, concentrations of lead at this level pose a health risk, especially to children under 72 months of age.

Based on the attached site sketch by MDNR (Figure 2) we see that this is a recreational area for the Cinnamon Square subdivision that includes a pool, pavilion, basketball court, tennis court, and children's play equipment. We also understand that the mine waste pile identified on the map is also known as the "Children's Mountain", and has been a popular recreation spot for children, as have the mill ruins adjacent to the pile. Unfortunately, most of the highest levels of lead were detected around the concrete pillars of the mill ruins (See Photos 1 and 2). Children and other individuals may be exposed to high levels of lead by playing in this area or by crossing this area to the other play areas. Almost all of the samples in the remaining area of Cinnamon Square Commons and the surrounding residential area showed lead below 400 ppm (1).

As we understand, shortly after MDNR informed you of the April 17, 2007, sampling results a construction-type fence was erected around the mill ruins, where the elevated levels of lead are located. This action should lessen the potential for exposure to the lead contaminated area by neighborhood children. However, the construction fencing is not a particularly effective barrier in the long-term, and without maintenance this type of fencing is not at all permanent.

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Below are a discussion of the potential health effects of lead, some conclusions regarding this site and some recommendations to help community members protect their own health and that of their families.

Toxicological Summary:

The pathways of concern for lead exposure are inhalation and ingestion. Lead is not readily absorbed through the skin, so dermal contact is not an important route of exposure. Studies have shown that there is a definite correlation between concentrations of lead in soils and blood lead levels in children. In general, blood lead levels increase as the lead concentrations in soil and dust increase. As blood lead levels increase, the likelihood of adverse health effects also increases. Examples of adverse health effects of children exposed to lead include learning difficulties and behavioral problems.

The U.S. Environmental Protection Agency (EPA) uses 400 ppm of lead as a standard clean up level for residential soils. In general, when the area is used by sensitive populations (such as children under 72 months of age or pregnant women) on a regular basis, EPA recommends removal of residential soil containing lead concentrations above 400 ppm. However, site-specific action levels may vary.

Conclusions:

In the past, it is likely that individuals, and especially children, were exposed to the elevated levels of lead around the mill ruins in the Cinnamon Square Commons. Because of the previous potential exposures to lead-contaminated materials in the environment, we consider the site to be a *Public Health Hazard* for the past. The category of a public health hazard is assigned to sites that pose a public health hazard as the result of long-term exposures to hazardous substances.

Because site access has been temporarily restricted by the construction-type fencing, the site is considered a *No Apparent Public Health Hazard* in the present. A no apparent public health hazard is assigned to sites where human exposure to contaminated media is occurring, but the exposure is below a level of health concern. However, a more permanent solution should be found to reduce or eliminate lead exposure at this site. As long as the fencing is maintained and stays in place until a permanent solution is implemented, the site may remain *No Apparent Public Health Hazard*. However, if the fencing fails or is not maintained the site would again be considered a *Public Health Hazard*.

Recommendations:

To determine and further reduce the possibility of lead exposure at this site, DHSS recommends the following for the residents of the Cinnamon Square subdivision:

1. Have children's blood lead tested to determine if their potential exposure has affected their blood lead levels.
2. Ensure children practice good personal hygiene such as washing their hands before eating and provide them with a healthy diet high in calcium to lessen lead uptake into their bodies.

3. Maintain current barrier until a permanent remedial solution can be achieved to prevent children from being exposed to the high lead contamination.

DHSS/ATSDR will take the following steps to protect public health as needed.

1. DHSS/ATSDR will review additional sampling data as it becomes available and provide guidance regarding possible health risks if necessary.
2. DHSS/ATSDR will address community health concerns and questions as they arise.
3. DHSS/ATSDR will provide health education and educational materials when requested.

If you have questions or concerns, please contact Arthur Busch or Jonathan Garoutte of my staff at (573) 751-6102 or toll-free at (866) 628-9891.

Sincerely,



Cherri Baysinger
Bureau Chief
Bureau of Environmental Epidemiology

Cc: Michael Stroh, MDNR
CB:JG:AB