

Health Consultation

COPPER BASIN MINING DISTRICT

COPPERHILL, POLK COUNTY, TENNESSEE

EPA FACILITY ID: TN0001890839

JANUARY 16, 2004

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
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 consultations previously issued.

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HEALTH CONSULTATION

**COPPER BASIN MINING DISTRICT
ISABELLA, POLK COUNTY, TENNESSEE**

EPA ID (TN0001890839)

Prepared by
Tennessee Department of Health
Communicable and Environmental Disease Services
Under a Cooperative Agreement with
Agency for Toxic Substances and Disease Registry
Atlanta, Georgia

Background and Statement of Issues

The Tennessee Department of Environment and Conservation (TDEC), Division of Superfund, asked the Department of Health, Environmental Epidemiology (EEP), to provide guidance on the possibility of adverse health effects from manganese in soil in an area where children play. An area near Isabella, Tennessee, received mill tailings in the past from the Isabella Mill and the London Mill, which replaced the Isabella Mill. Currently the area of former mill tailings disposal is residential with two trailers, each with several children. A composite soil sample was taken from an area where a toy was located and where children play. Since that sample was taken, the owners of the trailers have denied access to their property. The Division of Superfund would like to take more samples, but will not force the issue if the manganese is at low enough levels to ensure safety of the children.

The Copper Basin Mining District Site is located in southeast Tennessee in Polk County, and northern Georgia in Fannin County, near the state border with North Carolina. The Copper Basin is the site of extensive former copper and sulfur mining operations that date back to the early 1800s. For more than 150 years, numerous companies and individuals were involved in various mining, refining, and manufacturing operations in the area. Mining operations ceased in 1987, and sulfuric acid production was discontinued in 2000.

Mining and related activities have resulted in the environmental degradation of portions of the Copper Basin, including the North Potato Creek Watershed, the Davis Mill Creek Watershed, and parts of the Ocoee River. Acidic conditions and leaching metals have impaired water quality, and deforestation has resulted in severe erosion. Abandoned and collapsing mine works and other deteriorating facilities and waste piles also pose significant physical hazards (EPA).

Discussion

TDEC took a composite sample of soil in an area at the two trailers where a toy truck was observed and that seemed to be used as a sand box by the children. The sample was collected by scooping approximately equal amounts of material into a pan, thoroughly mixing, and then collecting a sample of the mixed material for laboratory analysis. The material is sandy and mixes well. Depth of sampling was two inches, with aliquots forming the composite sample taken from different holes. The area of the composite sample was less than 15 feet by 15 feet. At the time of sampling, there was no vegetation between the area sampled and the trailers. Since sampling occurred, DSF found that vegetation (grass) would not grow due to a lack of phosphorous. With the addition of the appropriate fertilizer, revegetation of the area has been successful.

Laboratory analyses indicated that the soil contains 1800 milligrams/kilogram (mg/kg) of manganese. This level of manganese is consistent with concentrations of manganese in over 20 samples taken of mill tailings from the former London Mill. None of the other metals exceeded any EPA risk based levels or remediation goals.

Manganese compounds naturally occur in soil and water, although it can also be introduced into the environment through human activity. Natural levels in soil usually range from 40 to 900 ppm. Manganese is an essential nutrient. The body regulates the amount of manganese

absorbed, maintaining a constant amount of manganese in the body, even when exposure rates are higher or lower than usual. However, if too much manganese is taken in, the body may not be able to adjust for the added amount (ATSDR 2000).

Children's Health Considerations

In their daily activities, children contact a very different physical environment than adults do. Therefore, their behavior in their surroundings might allow them to contact manganese in ways in which adults typically would not. Young children sometimes eat dirt on purpose and often eat dirt accidentally by putting their hands into their mouths. If the soil contains manganese, children can be exposed to manganese in this unique way. However, there is little information on how well manganese in soil can be taken up from the stomach into the body if children eat it.

ATSDR has calculated an intermediate reference dose media evaluation guide of 3000 parts per million (ppm) for children ingesting manganese in soil. The concentration of manganese in the play area (1800 ppm) is well below this guidance level. An intermediate guideline would be an appropriate comparison in this case, since children will ingest soil while playing in a sand pile for a few years at most and only in reasonably warm weather.

Conclusions

No apparent health hazard currently exists for children playing in the sand box area.

Recommendations

None at this time.

Public Health Action Plan

None at this time.

References

Environmental Protection Agency (EPA) – Region 4. Copper Basin Mining District, Site Background. Available from: <http://www.epa.gov/region4/waste/copper/index.htm>.

Agency for Toxic Substances and Disease Registry (ATSDR). September 2000. Toxicological Profile for Manganese. Atlanta: US Department of Health and Human Services.

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CERTIFICATION

This Health Consultation: Copper Basin Mining District, Polk County, Tennessee, was prepared by the Tennessee Department of Health, Environmental Epidemiology, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

Roberta Erlwein

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