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Health Consultation

Assessment of Lead in Soil

COEBURN PRODUCE DISPOSAL

COEBURN, WISE COUNTY, VIRGINIA

EPA FACILITY ID: VAN000305931

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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

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Prepared by:

Exposure Investigation and Consultation Branch
Division of Health Assessment and Consultation
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Background and Statement of Issue

The Coeburn Produce Disposal Site is located in a residential area of Coeburn, Virginia, a town with approximately 10,000 residents. The site is less than one acre in size and is covered with light brown fill that contains shale and dumped/crushed materials containing lead [1,2].

There are no buildings on the site, there is no plant growth on the site, and the site is freely accessible to humans and animals. The area is flat with a rise in the center; that rise covers a culvert. The water moving through the culvert flows into Little Tom's Creek (about 2–3 blocks downgradient), which feeds the Guest River. The site is subject to erosion, particularly in the area of the culvert [1,2].

In October of 2002, the Virginia Department of Environmental Quality (VADEQ) requested that the U.S. Environmental Protection Agency (EPA) investigate lead contamination at the site [1,2]. (The source of the fill material is currently under investigation by VADEQ.)

In March of 2003, EPA's Superfund Technical Assessment and Response Team (START) collected samples of surface water (4 samples), sediment (4 samples), and soil (26 samples) [1,2].

EPA representatives, a staff member from the Virginia Department of Environmental Quality, and the town manager visited the site in July of 2003. All of the site visit participants observed battery casings and parts in the cover fill [1,2].

On September 11 of 2003, EPA asked the Agency for Toxic Substances and Disease Registry (ATSDR) for an assessment of the hazard associated with the lead concentrations on the site [1,2].

Specifically, EPA asked if the lead contamination found on the site and off the site poses a public health hazard to residents living near the site.

Site Analysis Data. The only surface water sample with lead concentrations substantially above the field and laboratory blanks was taken from water in the culvert area. That sample had a lead concentration of 13.8 parts per million (ppm).

The highest concentration of lead in a sample of sediment from the site (taken near the culvert) was 627 ppm. The highest concentration of lead found in a sediment sample off site was 466 ppm; this sample was taken from a downstream area near the confluence with Little Tom's Creek.

The surface soil samples were sieved prior to laboratory analyses. Two of the 14 surface soil samples (0–3 inch depth) exceeded 400 ppm (445 ppm and 3,760 ppm). Six of the 12 subsurface soil samples (8–20 inch depth) had lead concentrations ranging from 1,000 ppm to 8,060 ppm. A subsurface soil sample that was found to have a lead concentration of 1,870 ppm had a duplicate sample with a lead concentration of 94.7 ppm.

Discussion

Results of analysis of the soil samples show elevated levels of lead in the surface and subsurface soil at the Coeburn Produce Disposal Site. Discussions with EPA representatives, as well as photos of the site, indicate that the fill material is a heterogeneous mixture of soil, shale, and debris that does not support the growth of grass or other plants. The disparity in the two values from a subsurface sample location where duplicate samples were collected may also indicate the heterogeneous nature of the fill material. The evidence pointing to the heterogeneous nature of the fill material also suggests that the limited number of samples collected to date are not likely to provide an adequate characterization of the site.

Because most naturally occurring waters have lead concentrations below 0.1 ppm [3], the surface water sample with a lead concentration of 13.8 ppm suggests that the site contributes lead to the water moving through the site. The signs of erosion at the culvert area and the finding that downstream sediment contains elevated levels of lead suggest that off-site migration is occurring. The apparent inability of the site to support plant growth may enable further erosion and thereby enhance the potential for off-site migration in the future. An EPA representative stated that drinking water in the area is provided by a public distribution system. Because the surface water is not used for drinking water, it is not considered a human health hazard.

Free access to the site allows people to come into contact with the lead-contaminated soil, and there is evidence of human activity on the site [1,2]. Because the site is in a residential area and access to the site is unrestricted, ATSDR has determined that the elevated concentrations of lead in the soil present a public health hazard.

Child Health Considerations

ATSDR recognizes that infants and children may be more vulnerable to environmental exposures than adults. Childhood exposures to lead are of particular concern because exposure to lead can affect children's developing nervous systems [3]. Children near the site have free access to the site. This aspect of the potential for exposures was considered when formulating the conclusions and recommendations for the Coeburn site.

Conclusions

1. Because the soil at the site contains lead concentrations above a level of health concern, the site is categorized as a public health hazard.
2. Lead may be migrating off the site and may be a source of the lead found at a downgradient location.
3. The extent of the contamination both on the site and off the site needs further characterization.

Recommendations

1. Restrict access to the site.
2. Control erosion at the site to prevent off-site migration of contaminants.
3. Fully characterize the on-site and downgradient contamination.

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per
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References

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2. Personal communication with R. F Kelly, On-Scene Coordinator, U.S. Environmental Protection Agency.
3. Agency for Toxic Substances and Disease Registry. Toxicological profile for lead (update). Atlanta: U.S. Department of Health and Human Services, 1999.