

Health Consultation

HAVEN AVENUE LEAD SITE

OCEAN CITY, CAPE MAY COUNTY, NEW JERSEY

CERCLIS NO. NJ0001901131

DECEMBER 16, 1997

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

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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HEALTH CONSULTATION

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Prepared by:

Exposure Investigation and Consultation Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

Background and Statement of Issues

The Region II, U.S. Environmental Protection Agency (EPA) has requested that the Agency for Toxic Substances and Disease Registry (ATSDR) review soil sampling data from the Haven Avenue Lead site and determine if soil lead concentrations pose a public health threat to residents [1].

The site consists of several residences located along Haven Avenue in Ocean City, New Jersey. In November 1995, the Cape May County Health Department (CMCHD) identified a child with an elevated blood lead level living on the 600 block of Haven Avenue. A follow-up investigation by the CMCHD did not detect lead paint in the home. However, soil sampling showed lead concentrations in the child's yard exceeding 5,000 parts per million (ppm) [2]. It was later determined that furnace ash was used as fill material in the neighborhood and was the probable source of the lead contamination in the soil [2].

At the request of EPA, ATSDR provided a Health Consultation for the site in October 1996. In the consultation, ATSDR concluded that lead was present in the soil of the child's yard at levels of health concern, and additional sampling was required to determine the extent of contamination in the neighborhood. It was recommended that sampling be conducted in yards suspected of receiving fill material, and that samples be analyzed for contaminants commonly found in furnace ash [3].

In June 1997, EPA's Superfund Technical Assessment and Response Team (START) collected surface and subsurface soil samples from 74 locations on Haven Avenue where areal photographs and previous investigations indicated potential contamination [2]. In addition to residential properties located along Haven Avenue, samples were collected from a primary school and from the Housing and Urban Development (HUD) Complex [2]. A total of 119 samples were analyzed by X-ray Fluorescence (XRF) screening. Confirmatory analysis using Inductively Coupled Plasma Emission Spectrometry (ICP) was completed on 10% of the soil samples [2]. In addition to the lead analysis performed on the soil samples, EPA performed testing for organic and inorganic chemicals. The results of the inorganic and organic chemical analyses did not indicate any contamination other than lead that warranted further investigation [4].

The XRF soil sampling results indicated that lead contamination is present throughout the 600 block of Haven Avenue (see attached map). Surface soil (0-3 inches) levels of lead ranged from non-detect to 5,500 ppm. Lead concentrations in subsurface soil (6-12 inches) were as high as 6,200 ppm. Soil lead levels at the primary school, HUD Complex, and the 200 block of Haven Avenue were \leq 250 ppm.

The ICP conformational analysis conducted on 10% of the XRF samples showed higher values. For example, sample results using the XRF screening method showed lead at 5,700 ppm for sample number 634-2B. The ICP results for the same sample was 9,980 ppm lead. The results for sample numbers 634-4B and 634-2A were also higher when analyzed via ICP, and increased from 5,500 and 5,100 ppm, respectively, to over 7,000 ppm.

Discussion

The soil sampling results indicate that lead is present at elevated levels on residential properties situated along the 600 block of Haven Avenue. The sampling results did not show high levels of lead in samples collected at the primary school, HUD Complex, or the 200 block of Haven Avenue.

Along the 600 Block of Haven Avenue where the contamination was found, lead was detected at levels that pose a threat to residents who may come in contact with the soil. The concern at this site is primarily for children since studies indicate that ingestion and inhalation of lead-contaminated media can contribute to elevated blood lead levels [5]. Blood lead levels in young children have been reported to be raised, on average, about 5 micrograms per deciliter (ug/dL) for every 1,000 milligrams of lead per kilogram of soil or dust, and may increase 3 to 5 times higher than the mean response depending on play habits and mouthing behavior [5]. Blood lead levels of 10 ug/dL and above have been associated with adverse health effects such as developmental and hearing impairment, and reductions in intelligence quotient (IQ) in children [5,6].

The Centers for Disease Control and Prevention (CDC) has indicated there is sufficient evidence that adverse health effects occur at blood lead levels at least as low as 10 ug/dL in children [5]. Young children and fetuses are especially sensitive to the toxic properties of lead.

Factors accounting for this susceptibility include the following: 1) the blood-brain barrier is incompletely developed in the fetus, which allows entry of lead into the immature nervous system, 2) hand-to-mouth behavior and pica behavior (ingestion of non-food items such as soil), which leads to consumption of lead-contaminated media, 3) enhanced gastrointestinal absorption of lead (affected by the nutritional status of the child), 4) low body weight, and 5) the ready transfer of lead across the placenta to the developing fetus [5]. These factors put children exposed to lead at a much higher risk of developing adverse health effects than adolescents and adults.

Adults are less likely to ingest significant amounts of contaminated soil, and are less sensitive to the neurotoxic effects of lead. However, high doses of lead in adults can affect the central nervous system, peripheral nervous system, blood system, and kidneys [6,7]. Adults may be exposed to lead while gardening or engaged in other activities that involve contact with, or incidental ingestion of lead-contaminated soil.

Conclusions

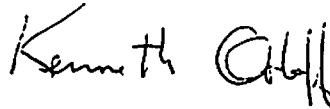
Lead was detected in the soil at several residences along the north side of the 600 block of Haven Avenue at levels that pose a health threat to those who may come in frequent contact with the soil. The greatest threat is to children, and to a lesser degree, adults.

Recommendations

1. Remediate contaminated areas in yards to reduce exposure to lead contaminated soil.
2. Ensure that all children less than six years old who reside in residences on or adjacent to contaminated yards are tested for blood lead levels. If elevated levels are detected, implement CDC's recommendations for follow-up activities [5].



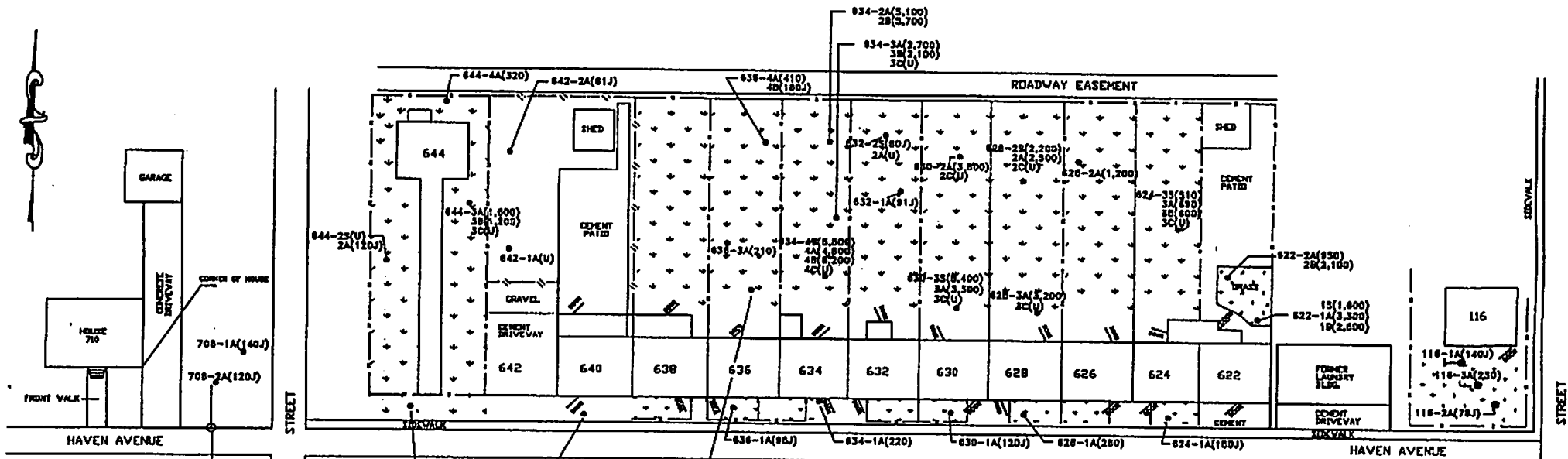
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References

- [1] Cover Letter for the Haven Avenue Lead Site from Brian Von Gunten, ATSDR.
- [2] X-Ray Fluorescence Analysis, Haven Avenue Lead site, Roy Weston, Inc. July 1997.
- [3] ATSDR Health Consultation for the Haven Avenue Lead site, October, 1996.
- [4] Inorganic Analysis for the Haven Avenue Lead Sites, Roy F. Weston, Inc. August 14, 1997.
- [5] Preventing Lead Poisoning in Young Children, A Statement by The Centers for Disease Control - October 1991, U.S. Department of Health and Human Services, Public Health Service.
- [6] Toxicological Profile for Lead, Update, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, April 1993.
- [7] ATSDR Case Studies in Environmental Medicine, Lead Toxicity, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, June 1990.



NOTE: SHEDD-BACKGROUND SAMPLE WAS COLLECTED AT THE NORTHWEST CORNER OF OCEAN CITY TOWNSHALE

LEGEND:

- CHAIN LINK FENCE
- WOODEN FENCE
- SAMPLE LOCATION
- - - PROPERTY LINE
- GRAVEL
- () - Pb CONCENTRATION IN ppm.
- J - INDICATES CONCENTRATION IS BETWEEN THE MCL AND MCL.
- U - INDICATES CONCENTRATION IS BELOW THE MCL.
- 0 - SAMPLE COLLECTED AT A DEPTH OF 0-3 INCHES.
- A - SAMPLE COLLECTED AT A DEPTH OF 3-6 INCHES.
- B - SAMPLE COLLECTED AT A DEPTH OF 6-12 INCHES.
- C - SAMPLE COLLECTED AT A DEPTH OF 12-24 INCHES.

- DRAWING NOT TO SCALE -

WESTON Roy F. Weston, Inc.
 FEDERAL PROGRAMS DIVISION

IN ASSOCIATION WITH PRO ENVIRONMENTAL MANAGEMENT, INC.,
 C.C. JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC.,
 R.C. SHAYKHA ASSOCIATES, AND DDB ENVIRONMENTAL SERVICES, INC.

FIGURE 2 - XRF LEAD LEVELS & SAMPLE LOCATION 1 FOR THE 600 BLOCK OF HAVEN AVENUE OCEAN CITY, NEW JERSEY JUNE 1997

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