Health Consultation

Ithaca Gun/Ithaca Falls Properties

City of Ithaca
Tompkins County, New York.

February 16, 2001

Prepared under a Cooperative Agreement with

U.S. Department of Health & Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry
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BACKGROUND AND STATEMENT OF ISSUES

The Agency for Toxic Substances and Disease Registry (ATSDR) produced this Health Consultation to assist the United States Environmental Protection Agency (USEPA) in the evaluation of the public health implications of exposure to lead contaminated soils at the Ithaca Gun/Ithaca Falls site and to help determine if a remedial action is necessary. Under a cooperative agreement with ATSDR, the New York State Department of Health (NYS DOH) is preparing this health consultation.

A. Site Description and History

From 1880 to the late 1980s, shotguns and firearms were manufactured at the Ithaca Gun site on Lake Street in Ithaca, Tompkins County. Ithaca Gun is at the top of a gorge overlooking Ithaca Falls and a section of Fall Creek that is popular for fishing. A pool at the base of Ithaca Falls, several hundred feet beneath the site, is a favored unsupervised swimming area. Widespread lead shot found on a parcel of land (Ithaca Falls parcel) adjacent to the former Ithaca Gun facility appears to have originated from the old factory. The City of Ithaca recently purchased the Ithaca Falls parcel from Cornell University with the intention of turning this and other City lands into parkland.

In 1961 and 1962, National Lead of Ohio subcontracted with the Ithaca Gun Company to test if forging machines, used in the manufacture of shotgun barrels, could forge hollow uranium billets into tubes for possible use as fuel cores. This work was for the Atomic Energy Commission, predecessor of the U.S. Department of Energy (US DOE). In 1995, the Oak Ridge Institute for Science and Education (ORISE) surveyed the Ithaca Gun gun-forging machine building for the US DOE. Any residual radioactivity on surfaces was less than a fifth of the US DOE guideline for interior or exterior surfaces.

B. Site Visit

Staff from the NYS DOH and New York State Department of Environmental Conservation (NYS DEC) visited the Ithaca Falls parcel on August 3, 2000. Several well-worn paths, which originate at a parking area, lead several hundred feet up the steep gorge to a rock plateau which appears to be a favored observation area for Ithaca Falls. Staff observed widespread lead shot on the ground surface and ample evidence of human activity in this area. Significant deposits of what appeared to be ash and cinders were also observed on the ground directly beneath the Ithaca Gun facility which overlooks the plateau area. The presence of a blanket, clothing, spoons, and food and beverage containers suggests the area is the location of frequent gatherings. On November 2, 2000 NYS DOH staff visited the Ithaca Gun site and observed significant evidence of human activity in the factory buildings as well as the surrounding grounds.
C. Demographics

According to 1990 United States Census Bureau data, approximately 2,000 people live within 0.25 miles of the site and 7,500 people within 0.5 miles of the site. The NYS DOH learned that the Ithaca Falls parcel is a favorite gathering area for students of Ithaca High School which is less than 0.25 miles from the site. The Fall Creek Elementary school is also about 0.25 miles from the site.

DISCUSSION

A. Environmental Contamination

Surface soil samples from the Ithaca Falls parcel were collected on three occasions (1994, 1997, and 1998) and contained high levels of lead. The soil samples collected by Cornell University in 1997 contained lead ranging from 740 to 111,000 milligrams per kilogram (mg/kg) with an average concentration of 28,300 mg/kg [1]. Samples from the plateau gathering area contained up to 83,600 mg/kg lead. The soil samples collected by the NYS DEC in 1998 contained lead ranging from 591 to 215,000 mg/kg with an average concentration of 39,400 mg/kg [2]. Sediment samples collected from an adjacent millrace that empties into Fall Creek near the popular swimming and fishing area also contained elevated levels of lead. The highest concentration of lead in sediment, 136,000 mg/kg, is found at the top of the mill race next to the Ithaca Gun facility. Sediment lead concentrations drop to 91 mg/kg at the bottom of the mill race near the outfall to Fall Creek. Of the soil and sediment samples collected in 1997 and 1998, four samples were in excess of 100,000 mg/kg lead with the maximum concentration of 215,000 mg/kg found in soils closest to the Ithaca Gun facility.

The US EPA conducted a removal site assessment in September 2000. They collected 110 soil and sediment samples from the Ithaca Falls parcel, the millrace, and the former Ithaca Gun facility. The US EPA analyzed the samples using X-Ray Fluorescence (XRF). XRF is an instrument that measures lead in the field. Ten percent of the XRF analyzed samples were further analyzed by Inductively Coupled Plasma Emission Spectroscopy (ICP), a standard laboratory method, to confirm the accuracy of the XRF method. Sediment samples from Fall Creek contained no detectable levels of lead. Soil samples from the Ithaca Falls parcel and the millrace confirmed previous sampling results. The highest levels of lead in soil and sediment occur at the top of the slope nearest the former Ithaca Gun facility. Lead levels decrease to typical background levels at the base of the Ithaca Falls parcel and the lower portion of the millrace before it enters Fall Creek. For the samples collected in September 2000, surface soil from 0-6 inches on the Ithaca Falls parcel contained lead in concentrations up to 51,200 mg/kg. Subsurface soil samples collected at 15 inches depth contained lead in concentrations up to 28,900 mg/kg. Millrace sediment samples contained lead in concentrations up to 10,800 mg/kg. Surface soil samples collected from the former Ithaca Gun facility contained lead in concentrations from 930 to 136,600 mg/kg.
B. Exposure pathways

NYS DOH staff observations during the August 3 and November 2, 2000 site visits confirmed that there are completed exposure pathways. People accessing the Ithaca Falls parcel and former Ithaca Gun facility may be exposed to high levels of lead from dermal exposure to soil and from accidental ingestion of lead contaminated soils and inhalation of lead dust or lead-containing soil.

Because access to the Ithaca Falls parcel is physically difficult and the former Ithaca Gun facility is fenced, small children are unlikely to frequent the most contaminated areas. However, sampling indicates that the lead contamination may be migrating downhill. Furthermore, visitors/trespassers may track lead off-site. Of particular concern are high school students tracking lead home where younger siblings may be exposed.

C. Toxicological and Epidemiological Evaluation for Adult and Children’s Health Issues

Chronic exposure to lead is predominantly associated with effects on the nervous system and blood (e.g. anemia and increased blood pressure). The developing fetus and young children are particularly sensitive to lead-induced effects [3]. For example, lead exposure is associated with premature birth and low birth weights, and may affect mental and physical development in children. The highest levels of lead detected in soil at or near the Ithaca Gun site (54,000 to 215,000 mg/kg) could increase exposure of people to this contaminant and pose a health concern for lead-related health effects, especially for young children.

D. Community Health Concerns

One person who lives in Ithaca recently called for the immediate clean up of the Ithaca Gun/Ithaca Falls site and has focused attention on the potential threat to public health posed by the lead contamination at this site. NYS DOH staff also have received several phone calls from citizens of Ithaca with concerns regarding exposure to the lead at the site.

CONCLUSIONS

Based on the on-site observations, the available sampling data, and ATSDR’s hazard category classification, the areas of lead contamination at the Ithaca Falls parcel and the former Ithaca Gun facility pose a public health hazard. Direct contact, incidental ingestion, and inhalation of contaminated soils are likely. Off-site transport of contaminated soils is also a possibility.

RECOMMENDATIONS

Based on the potential for adverse health effects resulting from exposure to the elevated levels of lead at the Ithaca Gun/Ithaca Falls site, the NYS DOH, in consultation with the ATSDR, recommends that measures be taken to prevent or reduce human exposure to the contaminated soils.
The following recommendations are also offered:

1. Continue to maintain the posting of "Caution" signs at the Ithaca Falls parcel until remediation is complete.

2. Further characterize the nature and extent of contamination at the former Ithaca Gun facility to identify areas where human exposures are a potential concern and where remediation may be warranted.

PUBLIC HEALTH ACTION PLAN

The Public Health Action Plan (PHAP) for the Ithaca Gun/Ithaca Falls site contains a description of actions taken or to be taken by ATSDR and/or the NYS DOH following completion of this health consultation. The purpose of the PHAP is to ensure that this health consultation identifies public health hazards and provides a plan of action designed to mitigate and prevent adverse human health effects resulting from the past, present and/or future exposures to hazardous substances at or near the site. Included is a commitment on the part of ATSDR and/or the NYS DOH to follow-up on this plan to ensure that it is implemented. The public health actions are as follows:

1. The NYS DOH posted signs at the site warning people who visit the Ithaca Falls parcel of the potential harm associated with exposure to lead contaminated soils and measures they may take to reduce exposure.
2. The NYS DOH and ATSDR will continue to work with the NYS DEC and US EPA to identify and characterize the extent of lead contamination at the Ithaca Falls parcel and the Ithaca Gun site.
3. The NYS DOH and ATSDR will coordinate with the NYS DEC and USEPA to develop a plan to implement the recommendations contained in this health consultation.
4. The NYS DOH and ATSDR will provide follow-up to this PHAP, as needed, outlining the actions completed and those in progress. This report will be placed in repositories and will be provided to people who request it.
5. The NYS DOH will coordinate with the appropriate environmental agencies to continue community health education activities to people living in or near the area. These activities will include meeting with the public and providing information on potential health concerns and ways to reduce exposures to contaminated soils.

ATSDR will reevaluate and expand the PHAP when needed. New environmental, toxicological, or health outcome data, or the results of implementing the above proposed actions, may determine the need for additional actions at this site.
REFERENCES


2. NYS DEC. March and April 1998. Soil Sample result reports.

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CERTIFICATION

The health consultation for the Ithaca Gun/Ithaca Falls Properties site was prepared by the New York State Department of Health 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 initiated.

[Signature]
Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

[Signature]
Acting Chief, SSAB, DHAC, ATSDR