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Health Consultation

Public Health Implications of Private Well Sampling from Wells
Near the Barkhamsted-New Hartford Landfill

BARKHAMSTED-NEW HARTFORD LANDFILL

BARKHAMSTED, LITCHFIELD COUNTY, CONNECTICUT

CERCLIS NO. CTD980732333

JUNE 14, 2000

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 conclusions previously issued.

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Prepared by:

Connecticut Department of Public Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

The conclusions and recommendations in this Health Consultation are based on the data and information made available to the Connecticut Department of Public Health and the Agency for Toxic Substances and Disease Registry. The Connecticut Department of Public Health and the Agency for Toxic Substances and Disease Registry will incorporate additional information if and when it becomes available. The incorporation of additional data could change the conclusions and recommendations listed in this document.

BACKGROUND AND STATEMENT OF ISSUES

The U.S. Environmental Protection Agency (EPA) requested that the Connecticut Department of Public Health (CT DPH) and the Agency for Toxic Substances and Disease Registry (ATSDR) examine the private well data from wells near the Barkhamsted-New Hartford Landfill Superfund Site in Barkhamsted, CT [1]. The purpose of this Health Consultation is to determine whether the well water is contaminated at levels that pose a public health hazard.

The Barkhamsted-New Hartford Landfill Site (BLS) is a National Priorities List (NPL) Superfund hazardous waste site. This site previously operated under a Solid Waste Disposal Facility permit issued by the Connecticut Department of Environmental Protection (CT DEP). The BLS received municipal and industrial waste including but not limited to oily sludge from metal grindings operations until August of 1988. This sludge contained cadmium, chromium, copper, lead, manganese, nickel, and zinc. In addition, the BLS has been an active metal and paper recycling center since 1974. This landfill stopped receiving bulk waste and sludge in 1993. Presently, the BLS only receives bulky and solid wastes (which is not able to be processed), and various materials for recycling including: old clothes, cardboard, box-board, waste oil, antifreeze, junk mail, drycell batteries, newspaper, food containers, magazines, office paper, telephone books, tires, automotive batteries, tire tubes, leaves, and grass clippings.

The BLS is 97.8-acres, and is located in Barkhamsted, Litchfield County, Connecticut. The BLS is located on a northward and eastward sloping hill, with the highest elevation located on the south-west portion. Several springs are reported to be buried under the landfill. An unnamed brook is located along the west and northern boundary of the site. Active seeps and leachate from the landfill were identified along the southwestern border near the unnamed brook. This brook flows through a wetland area and into the Farmington River. The area where the landfill is located is heavily wooded. In addition, a state road is located several hundred yards south of the landfill [2].

On March 11, 1997, a public health assessment for the Barkhamsted-New Hartford Superfund site was completed [2]. Contamination was detected at one drinking water well on the site and one well off site. Historic sampling from one of the wells servicing the landfill office was reviewed, and that well was closed in 1984 by the Farmington Valley Health District. The closure consisted solely of electrically disconnecting the power from the well pump [6]. The other contaminated well, located at the Barkhamsted Town Garage, is not being used for drinking, and bottled water is currently used as the potable water supply. Although this well is not closed, a posted sign advises against drinking water from that well. Well water reportedly is used for industrial, presumably non-potable, purposes only.

In 1988, ten private drinking water wells were sampled for various site-related contaminants. They were selected because of their potential to become contaminated by site-related chemicals. Three of these wells did contain low levels of four metals: antimony, arsenic, lead, and selenium. Exposure to these low levels did not present a public health hazard. The principle responsible parties (PRPs)

determined that those three wells were are not at risk to become contaminated by site-related chemicals. The three wells are upgradient of the plume. The levels of metals detected in the three wells were likely to be of natural origin.

The PRPs did identify three other wells, located downgradient of the plume, that were potentially at risk for contamination by the landfill plume. Those three wells are the focus of this health consultation.

DISCUSSION

Drinking Water Analysis

During November and December of 1999, environmental sampling was coordinated by the US EPA [3]. Three private drinking water wells were included in this investigation. Two of these wells were sampled from an outside spigot, and the third was collected from a kitchen tap. No filters were observed at the sampling points. The existence of any filter system was not determined. This private water analysis was implemented in a continuing effort to evaluate the impacts on private drinking water well users from ground water contamination by BLS. Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals were analyzed. The results are presented in table 1.

Table 1
Private Drinking Water Analysis [3].

Chemical	Concentration Range ppb	Comparison ppb	Value Source
Methylene chloride	None detected - 0.69	5	CREG
Toluene	None detected - 0.27	200	Int EMEG Child

ppb	parts per billion
CREG	Cancer Risk Evaluation Guide
Int EMEG Child	Intermediate Environmental Media Evaluation Guide

Exposure Assessment - Child and Adult

In order to assess the public health risks posed by exposure to the low levels of contaminants in the drinking water, the CT DPH developed several exposure assumptions. These include such factors as volume of water consumed per day for a child and an adult, as well as length of exposure. The exposure pathways that were examined include the ingestion by children and adults. The exposure assumption duration used was 70 years.

Public Health Implications - Child and Adult

To evaluate health effects, the ATSDR has developed a Minimal Risk Level (MRL) for contaminants commonly detected at hazardous waste sites. The MRL is an estimate of daily human exposure (dose) to a contaminant below which non-cancer, adverse health effects are unlikely to occur. An exposure above an MRL does not indicate that an adverse health effect is likely to occur. Rather, an exceedance is used as an indication that additional review for that chemical is required. MRLs are developed for each route of exposure such as ingestion, inhalation, and dermal absorption and for the length of exposure, such as acute (less than 15 days), intermediate (15 to 364 days), and chronic (greater than 364 days). This evaluation included an assumption of both a short-term and chronic scenario.

Methylene Chloride:

In order to determine whether exposure to methylene chloride in drinking water could result in adverse health effects, we calculated exposure doses based on the maximum measured concentration of 0.69 ppb. A separate exposure dose was determined for children and adults. Since neither dose exceeded the chronic MRL, we conclude that non-carcinogenic health effects in adults and children are unlikely. Since methylene chloride has been classified by the EPA as a group B2 carcinogen, we also assessed the theoretical cancer risks for adults and children consuming drinking water with methylene chloride at 0.69 ppb for a lifetime. The cancer estimates were determined to be insignificant. Using the worst case assumptions, neither children nor adults would be expected to become ill as a result of a lifetime of drinking water containing methylene chloride at the maximum concentration of 0.69 ppb.

Description

Methylene chloride, also known as dichloromethane, is a colorless liquid that has a mild sweet odor, evaporates easily, and does not easily burn. It is widely used as an industrial solvent and as a paint stripper. It can be found in certain aerosol and pesticide products and is used in the manufacture of photographic film. The chemical may be found in some spray paints, automotive cleaners, and other household products. Methylene chloride does not appear to occur naturally in the environment. It is made from methane gas or wood alcohol. Most of the methylene chloride released to the environment results from its use as an end product by various industries and the use of aerosol products and paint removers in the home. [4].

Toluene:

The approach used for the determination of potential adverse health effects from exposure to toluene was similar to that used in the case of methylene chloride. The toluene exposure dose calculations used the maximum detected value of 0.27 ppb. Although there is no chronic MRL for toluene, neither dose exceeded the intermediate MRL. The intermediate MRL was based on less serious health effects observed in animals that included changes in the levels of brain neurotransmitters. Since the calculated doses we derived for adults and children were almost 1,000 times below the intermediate MRL, non-carcinogenic adverse health effects in adults and children is unlikely. Toluene, unlike methylene chloride, is not currently classified by the EPA as to its ability to produce cancer. Consequently, the theoretical cancer risk estimations were not calculated. Using the worst case assumptions, neither children nor adults would be expected to become ill as a result of a lifetime of drinking water containing toluene at the maximum concentration of 0.27 ppb.

Description

Toluene is a clear, colorless liquid with a distinctive smell. It is added to gasoline along with benzene and xylene. Toluene occurs naturally in crude oil and in the tolu tree. It is produced in the process of making gasoline and other fuels from crude oil, in making coke from coal, and as a by-product in the manufacture of styrene. Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes. It is disposed of at hazardous waste sites as used solvent (a substance that can dissolve other substances) or at landfills where it is present in discarded paints, paint thinners, and fingernail polish. [5].

CONCLUSIONS

The results from the current round of private well analysis indicates that very low levels of potentially site-related contaminants may have impacted these wells. However, the concentrations are low, and a continuous exposure would not be expected to result in any adverse health effects. These levels represent a no apparent public health hazard. This category is designated for exposures that are occurring, but where the levels are well below any levels of health concern.

RECOMMENDATIONS

Since site-related contamination may be impacting private wells located downgradient of the BLS site, additional sampling from these wells should be conducted.

Public Health Action Plan

1) The CT DPH will educate the community of these findings.

2) The CT DPH will continue to review private well sampling data related to the BLS site.

CERTIFICATION

The Health Consultation for the private well water sampling from wells near the Barkhamsted-New Hartford Landfill Site was prepared by the Connecticut Department of Public 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.

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.

for Chief, SSAB, DHAC, ATSDR

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References

1. Correspondence from Carolyn Pina-Springer (States Environmental Protection Agency Remedial Project Manager) to: Gary Perlman (CT Department of Public Health). March 2, 2000.

2. ATSDR, Public Health Assessment For Barkhamsted-New Hartford Landfill Site New Hartford, Litchfield County, Connecticut CERCLIS NO. CTD980732333. March 11, 1997.

3. O'Brien & Gere Engineers, Inc. Data Validation Report: November/December 1999 Sampling Event Barkhamsted-New Hartford Landfill Superfund Site Barkhamsted, Connecticut. February 2000.

4. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Methylene Chloride, April 1993.

5. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Toluene, May 1994.

6. Personal Communication between: Gary D. Perlman, Epidemiologist (Connecticut Department of Public Health - Division of Environmental Epidemiology and Occupational Health), and: Jim Hart, Landfill Manger (Barkhamsted Landfill). June 19, 1995 3:40 pm.