

HEALTH CONSULTATION

HIGGINS DISPOSAL SERVICES

Franklin Township, Somerset County, New Jersey

Cerclis #: NJD053102232

July 18, 1994

Prepared by The New Jersey Department of Health

Under a Cooperative Agreement With

The Agency For Toxic Substances and Disease Registry

Background and Statement of Issues

The Higgins Disposal Services Site (HDS) is located at 121 Laurel Ave., in Franklin Township, Somerset County, New Jersey (see Figure 1). The site occupies approximately 37 acres, and land use in the area surrounding the site is primarily rural/agricultural. The site contains an on-site pond and an equestrian facility comprised of a stable and riding area. The HDS site was the location of an unpermitted waste transfer station and landfill from the 1950's through 1986. The landfill area contains approximately 2,260 cubic yards of hazardous, municipal and non-chemical waste. Recent investigations (1994) by the United States Environmental Protection Agency (USEPA) have confirmed the presence of drums, laboratory packs, and other containers of potentially hazardous wastes on-site. The site was placed on the National Priorities List in August 1990.

Contaminated environmental media at the site include on-site soils, surface water, and groundwater. Soils have been found to contain volatile organic compounds (VOC's), base neutral extractable compounds (BNA's), and polychlorinated biphenyls (PCB's). Surface water (an on-site pond downgradient from landfill area) is reported to be contaminated with PCB's. Ground water is contaminated with VOC's; this contamination is currently attributed to the landfill area and the location south of the landfill area where the drums and lab packs are located.

Groundwater contamination is of particular concern since a public supply well and 234 private potable wells are known to exist within a three mile radius of the site. In 1985, VOC's were found in concentrations of up to approximately 1,100 parts per billion (ppb) in nine residential wells located in a small cluster of homes near the site referred to as the Kingston/Laurel Avenue residences. Because of the contamination found in potable wells, the Kingston/Laurel Avenue sub-site was listed as an *Interim Well Restriction Area* by the New Jersey Department of Environmental Protection and Energy (NJDEPE) in 1986 (see Figure 2). Municipal water supplies are not presently available for residents in this area, and whole house point source filter systems are currently being utilized.

The USEPA has requested the New Jersey Department of Health (NJDOH) for a health consultation regarding the potable water analytical results for 98 (100) Laurel Avenue. This house was vacant during the most recent (August 1993) potable water sampling event, is currently being renovated, and is expected to be sold. The house does not currently employ a filtration system.

The NJDOH performed a Preliminary Health Assessment of the Higgins Disposal site in September 1990, prior to completion of the remedial investigation, and classified it as a "public health concern" as a result of probable exposure through the potable and domestic use of contaminated groundwater. Community and public health concerns were primarily associated with the issue of groundwater contamination. The NJDOH has visited the site in May 1989 and October 1990. ATSDR Regional Representatives visited the site in January 1991. Prior ATSDR/NJDOH activity was associated with citizen complaints regarding the use of the on-site equestrian facility by children (October 1990). The subsequent ATSDR Health Consultation

addressed on site soil contamination, by PCB's, in the riding and stable areas (January 1991). On-site soils were found not to pose an imminent threat, but were at levels where dust ingestion could constitute a public health concern. As a result, USEPA took measures to remediate the riding area.

Discussion

This consultation will address the issue of the potable well water quality at 98 (100) Laurel Avenue, based upon data presented to the NJDOH by the USEPA in the correspondence of May 19, 1994. The human exposure pathway of concern is the ingestion of contaminated groundwater. In total six VOC's (1,1 dichloroethylene, chloroform, carbon tetrachloride, trichloroethylene [TCE], tetrachloroethylene [PCE], and 1,1,2 trichloroethane) were present in concentrations exceeding ATSDR comparison values (Cancer Risk Evaluation Guides; CREG's). In addition, carbon tetrachloride, TCE, PCE, and 1,1,2 trichloroethane exceeded New Jersey Maximum Contaminant levels (MCLs). These compounds are listed in Table 1. For each compound, an exposure dose was estimated using the following assumptions: an adult will have a body weight of 70 kg and ingest 2 liters of water per day, and a child will have a average body weight of 16 kg and ingest 1 liter of water per day. In addition, calculated exposure doses were utilized to derive lifetime excess cancer risk (LECR) values. LECR calculation included the following assumptions: an adult would ingest the contaminated water for 30 years, and a child would ingest the water for 10 years.

Calculated exposure doses were compared to Minimal Risk Levels (MRL's) promulgated by ATSDR and USEPA where available. Specific MRL's for juvenile receptors were not available. MRL's are an estimate of the daily exposure to a contaminant that is unlikely to cause health effects. Exposure doses for all six compounds were below MRL values. In addition, exposure doses were below the lowest observed adverse effect levels (LOAEL's) cited in the ATSDR Toxicological Profiles for each respective compound. At such concentrations, it is not likely that non-carcinogenic adverse health effects would occur.

Individual lifetime excess cancer risk values were derived from calculated exposure doses. LECR's ranged from no apparent increased risk of cancer ($10E^{-5}$), to insignificant or no increased risk of cancer ($10E^{-6}$, $10E^{-7}$). No apparent increased risk may be interpreted as follows: If 100,000 adults ingested well water contaminated with a compound associated with a $10E^{-5}$ LECR for 30 years, between 1 and 2 additional cases of cancer may occur in 70 years. Similarly, if 100,000 children ingested well water contaminated with a compound at a concentration which yields a $10E^{-5}$ LECR for 10 years, between 1 and 2 additional cases of cancer may occur in 70 years. Thus, for potential residents of the property at 98(100) Laurel Avenue ingesting untreated well water, it is unlikely that they would develop cancer as a result of their exposure.

The toxicological effects of the contaminants detected in the potable well at 98(100) Laurel Avenue have been considered singly. The cumulative or synergistic effects of mixtures of contaminants may serve to enhance their public health significance. Additionally, individual

or mixtures of contaminants may have the ability to produce greater adverse health effects in children as compared to adults. This situation depends upon the specific chemical being ingested or inhaled, its pharmacokinetics in children and adults, and its toxicity in children and adults.

In addition, the potential exposure resulting from domestic non-potable use of contaminated well-water (i.e., showers, laundry, dishwashers) has not been quantified. Such activities serve to hasten the volatilization of contaminants and, depending upon circumstances, may add significantly to a total exposure dose through inhalation.

Conclusions

The potable well at 98(100) Laurel Avenue is contaminated with six VOC's at levels exceeding ATSDR comparison values (CREGs). Calculated exposure doses for individual contaminants do not exceed MRL's for these compounds. Individually, these compounds are not present at levels where non-carcinogenic adverse health outcomes would be likely. The cumulative effect of the mixture of these contaminants was not quantified.

Lifetime excess cancer risk associated with the ingestion of individual contaminants in water from this well represented (at worst) no apparent increased risk of cancer. The cumulative LECR resulting from the mixture of these contaminants was not quantified.

The presence of VOCs exceeding New Jersey MCLs in this well is sufficient reason to preclude its utilization without effective treatment or filtration.

Investigation by the USEPA has been adequate to determine the nature and extent of the groundwater contamination associated with the HDS site. All other residences in the area of the site employ filtration systems. Ongoing sampling of groundwater and potable well quality is sufficient to document plume migration and address the potential consequent public health implications.

Recommendations

- 1) Future owners of the property at 98(100) Laurel avenue should utilize a treatment system which is effective in filtering the contaminants present in the potable well.
- 2) Whole house point source filter(s) should be employed to preclude the use of non treated water for non-potable domestic purposes.
- 3) Post filter water quality should be confirmed before issuance of a certificate of occupancy by Franklin Township.
- 4) Area residents should utilize municipal water supplies at the earliest opportunity.

- 5) The proximity of this residence and others in the Kingston/Laurel Avenue area implies a need for routine monitoring of the effectiveness of well filtration systems.

Documents Reviewed

- 1) Public Health Assessment; Higgins Disposal Services Site. Agency For Toxic Substances and Disease Registry; September 27, 1990.
- 2) Draft Baseline Risk Assessment; Higgins Disposal Services Site. Malcolm Pirnie Inc., of the USEPA. March 1994.
- 3) Personnel Communication; Tap Water Analytical Results for 98(100) Laurel Ave. Sharon Jaffess, USEPA to James Pasqualo, NJDOH.
- 4) Health Consultation; Higgins Disposal Services. January 1991.

Table 1 - Higgins Disposal Services Site; Exposure Dose estimates and resultant Lifetime Excess Cancer Risk estimates for compounds detected in tap water at 98 Laurel Ave.

Compound	Conc. (ppb)	ATSDR Comparison Value (ppb)	Exposure Dose mg/kg/day Adult/Child	Chronic Oral MRL (Source)	LECR Adult/Child
1,1 Dichloroethylene	0.4	0.06 (CREG)	1.14 X 10 ⁻⁵ 2.5 X 10 ⁻⁵	0.009 (ATSDR)	2.9 X 10 ⁻⁶ 2.1 X 10 ⁻⁶
Chloroform	30.0	6.0 (CREG)	8.57 X 10 ⁻⁴ 1.88 X 10 ⁻³	0.01 (ATSDR)	2.2 X 10 ⁻⁶ 7.0 X 10 ⁻⁷
Carbon Tetrachloride	4.3	0.3 (CREG)	1.23 X 10 ⁻⁴ 2.7 X 10 ⁻⁴	0.0007 (USEPA)	6.8 X 10 ⁻⁶ 5.0 X 10 ⁻⁶
Trichloroethylene	9.7	3.0 (CREG)	2.77 X 10 ⁻⁴ 6.06 X 10 ⁻⁴	NA	1.4 X 10 ⁻⁵ 9.0 X 10 ⁻⁷
Tetrachloroethylene	18.0	0.7 (CREG)	5.14 X 10 ⁻⁴ 1.13 X 10 ⁻³	0.01 (USEPA)	1.1 X 10 ⁻⁵ 8.3 X 10 ⁻⁶
1,1,2 Trichloroethane	34.0	0.6 (CREG)	9.7 X 10 ⁻⁴ 2.13 X 10 ⁻³	0.004 (USEPA)	2.4 X 10 ⁻⁵ 1.7 X 10 ⁻⁵

CREG - Cancer Risk Evaluation Guide for 1 X 10⁻⁶ excess cancer risk.

MRL - Minimal Risk Level in mg/kg/day.

NA - A minimal risk level has not been established.

Preparers of Report

Preparer of Report:

James Pasqualo
ATSDR Health Assessment Project Manager
Environmental Health Service
New Jersey Department of Health

ATSDR Regional Representative:

Arthur Block
Senior Regional Representative
Region II

ATSDR Technical Project Officer:

Gregory V. Ulirsch
Environmental Health Specialist
Remedial Programs Branch
Division of Health Assessment and Consultation

Any questions concerning this document should be directed to:

ATSDR Project Manager
The New Jersey Department of Health
Environmental Health Service
210 South Broad St.
CN 360
Trenton, NJ 08625