

Health Consultation

EMMELL'S SEPTIC LANDFILL

GALLOWAY TOWNSHIP, ATLANTIC COUNTY, NEW JERSEY

CERCLIS NO. NJD980772727

JANUARY 6, 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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HEALTH CONSULTATION

EMMELL'S SEPTIC LANDFILL

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CERCLIS NO. NJD980772727

Prepared By:

**Hazardous Site Health Evaluation Program
Environmental Health Service
Division of Epidemiology, Environmental, and Occupational Health
New Jersey Department of Health and Senior Services
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**

Background

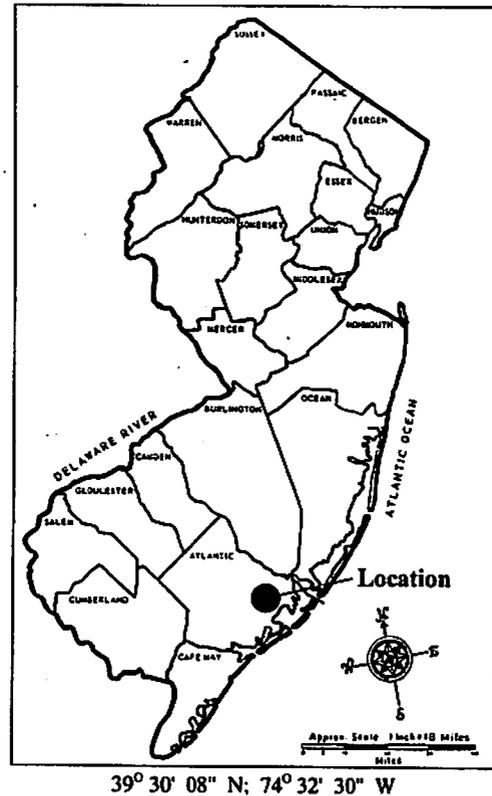
The Emmell's Septic Landfill (ESL) site is located in Galloway Township, Atlantic County, New Jersey (see inset). The ESL occupies an area of approximately 38 acres and is surrounded by woodlands and rural residential areas. It is estimated that approximately 100 persons live within ½ mile of the site, with the closest residences to the northwest, across Zurich Avenue, approximately 200 feet from the site's boundary (see Figure 1).

The ESL is the location of a former septic waste disposal facility. The disposal operations were active from 1967 - 1979, with the landfill accepting septic and sewage sludge into ponds, trenches, and lagoons. In addition, solid and chemical wastes were also disposed of at the ESL, including drums containing paint sludges, gas cylinders, tires, and construction/industrial debris. The site contains a fire damaged (abandoned) residence and a barn.

The ESL was the subject of several enforcement activities by the New Jersey Department of Environmental Protection (NJDEP) during the period from 1976 - 1980; these actions/citations were based upon failure of the ESL to submit proper designs for the disposal of septic waste. In 1984, the NJDEP conducted a site investigation at the ESL. Data indicated the presence of PCBs, hydrocarbons, and metals in soils, as well as metals and volatile organic compounds (VOCs) in groundwater collected from exploratory trenches. Groundwater occurs at the ESL site at a depth of five to ten feet, with a general flow toward the east.

In May and June 1984, the Atlantic County Health Department (ACHD) collected samples of five residential wells located on Lisa Drive (less than 2,000 feet east of the site). Data showed elevated levels of VOCs in groundwater, with concentrations exceeding the Maximum Contaminant Level (MCL) and Removal Action Level (RAL) for vinyl chloride (150 ug/l maximum) and the MCL for tetrachloroethylene (2 ug/l maximum) and trichloroethylene (4 ug/l maximum) in four wells. All the residential wells utilized the Kirkwood-Cohansey aquifer system and were screened at a depth of 100 - 120 feet. The NJDEP closed the affected wells and provided new deeper wells (170 - 240 feet; below a locally continuous clay aquatard) for residents utilizing the State Spill Fund.

Further sampling by the ACHD in February and August 1988 confirmed continued contamination at residences on Lisa Drive. In early 1996, the NJDEP conducted groundwater sampling at the ESL site and in surrounding areas. Monitoring wells were installed in March, 1996,



and in April 1997, NJDEP completed an expanded site inspection (ESI) which indicated that groundwater contamination on Lisa Drive was site related. The ESI also indicated VOC contamination in wells on Zurich Avenue, Liebig Street, and at near by Stockton State College (see Figure 2). Contaminants of concern in private wells included: cis-1,2-dichloroethylene (140 ug/l maximum), chloroform (9.4 ug/l maximum), and methyl-tert-butyl ether (<30 ug/l).

An initial site scoping was conducted by the United States Environmental Protection Agency (USEPA) in July, 1997. In late 1997 and early 1998, the USEPA (Remedial Action Branch and the Environmental Response Team) conducted soil and groundwater investigations to determine the source of VOC contamination in downgradient residential wells. On-site soil gas surveys indicated the presence of vinyl chloride, 1,1-dichloroethylene, cis-1,2-dichloroethylene, benzene, trichloroethylene, toluene, and tetrachloroethylene. Soil investigations also indicated the presence of PCBs (960 mg/kg maximum; soils) and lead (3,870 mg/kg; test pit) together with arsenic (3 mg/kg maximum; soils), chromium (838 mg/kg; test pit), cadmium (11.6 mg/kg; test pit), and zinc (1,270 mg/kg; test pit).

Statement of Issues

The USEPA is currently performing removal and stabilization actions at the ESL site. As previously stated, these activities include assessment of the groundwater pathway with respect to potable wells. Groundwater remediation at the site will be addressed through the Remedial Investigation/Feasibility Study process, as the site is now proposed for listing on the National Priorities List (NPL). The ATSDR/NJDHSS is currently preparing a Public Health Assessment for the ESL site which will serve to document and evaluate past and potential human exposure pathways associated with all environmental media at the site.

In August of 1999, the USEPA requested the ATSDR review the public health significance of groundwater (private well data) collected in May 1999. Specifically, the ATSDR and the NJDHSS were asked to evaluate, in the format of a Public Health Consultation, the potential health risk associated with lead concentrations detected in private potable wells during the May 1999 sampling event.

Community Concerns

The ATSDR and the NJDHSS attended a community meeting (August 17, 1999) at the request of the USEPA where the information from the May 1999 sampling event was presented to the community. Also participating was the ACHD and representatives of Galloway Township.

The community expressed concern regarding several issues including: the suitability of potable well water for consumption and the potential for adverse health effects, the possibility of providing bottled or public water supplies to the area, and the perception of an unacceptably long time frame for eventual remediation of the site under the Superfund process.

Discussion

The USEPA sampled 25 private wells on Leibig Street, Lisa Drive, and Zurich Avenue (see Figure 2). Lead levels ranged from non-detect to 111 ug/l, although most wells were at sub-action level concentrations. Two wells exhibited lead levels exceeding the USEPA action level of 15 ug/l. Lead data for the 25 private potable wells are presented in Table 1. In addition, data for four monitoring wells sampled during the same episode are presented .

Table - 1. Emmell's Septic Landfill Site. USEPA Private/Monitor Well Sampling conducted May 3-5, 1999. Lead concentrations in ug/l (ppb).

Private Well Designations									
Street	A	B	C	D	E	F	G	H	I
Liebig	5.1	11.7	3.1	3.7	3.1	5.5	111.0	-	-
Lisa	3.7	5.0	7.2	1.9	6.7	3.2	4.0	2.4	1.5
Zurich	4.5	5.9	1.6	5.2	ND	3.1	ND	ND	44.7
Monitor Wells	REAC MW5	DEP MW1	DEP MW4	DEP MW2	ND = Not Detected Minimum Detection Limit = 1.2 ug/l USEPA Action Level for lead = 15 ug/l				
	2.9	2.6	1.8	4.0					

Toxicological Evaluation

This section contains discussion of the health effects in persons exposed to lead through ingestion of contaminated groundwater, and attempts to address specific community health concerns. Health effects evaluations are accomplished by estimating the amount (or dose) of those contaminants that a person might come in contact with on a daily basis. This estimated exposure dose is then compared to established health guidelines. People who are exposed for some crucial length of time to contaminants of concern at levels above established guidelines are more likely to have associated illnesses or disease.

Health guidelines are developed for contaminants commonly found at hazardous waste sites. Examples of health guidelines are the ATSDR's Minimal Risk Level (MRL) and the USEPA's Reference Dose (RfD). When exposure (or dose) is below the MRL or RfD, then non-cancer adverse health effects are unlikely to occur. However, there is no current MRL or RfD for oral exposure for lead.

MRLs are developed for each type of exposure, such as acute (less than 14 days), intermediate (15 to 364 days), and chronic (365 days and greater). ATSDR presents these MRLs in Toxicological Profiles. These chemical-specific profiles provide information on health effects, environmental transport, human exposure, and regulatory status.

The toxicological effect of lead concentrations detected in the environmental media has 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.

To evaluate the public health significance of completed human exposure pathways associated with oral exposure to lead in groundwater, chronic exposure doses (EDs) were calculated. Toxicological estimates were calculated for adults assuming a 70 kg body weight and ingestion rate of 2 liters of water per day. Similarly, estimates for children assumed a 16 kg body weight, and an ingestion rate of 1 liter of water per day. Exposure durations were assumed to occur for a period greater than one year, and are based upon the data and information presently available to the ATSDR and the NJDHSS.

To determine the public health significance of exposure to lead in potable wells, the maximum detected concentration (111 ug/l; well "Leibig G", see table 1) was utilized for calculation of EDs. Calculated exposure doses for adults were estimated at approximately 0.0032 mg/kg/day. This dose is less than the lowest "No Observed Adverse Effect Level" (NOAEL) cited in the ATSDR Toxicological Profile for Lead with respect to oral exposures of intermediate or chronic duration. At such levels, non-carcinogenic adverse health effects would not be expected in non-hypersensitive individuals. Calculated exposure doses for children were estimated at approximately 0.007 mg/kg/day. Exposure doses for children exceeded the "Lowest Observed Adverse Effect Level" (Krasovskii, et. al.; 1979) for hematological, hepatic, reproductive, and neurological effects in animals (rats) for oral exposures (lead acetate in water) of intermediate duration as cited in the ATSDR Toxicological Profile for Lead. Similarly, estimated exposure doses for children which utilized the second highest concentration of lead detected (44 ug/kg; well "Zurich I", see table 1) roughly achieved the LOAEL cited above. Exposure doses based upon lead concentrations of less than 15 ug/l would not be expected to be associated with adverse health outcomes in non-hypersensitive individuals

Some animal studies have linked exposure to lead with cancer. However, there is inconclusive evidence relating oral lead exposure with cancer. A cancer slope factor for lead has not been established, therefore, lifetime excess cancer risk estimates could not be calculated at this time.

ATSDR Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination in their environment. Children are at greater risk than adults from certain kinds of exposures to hazardous substances emitted from a waste site. They are more likely to be exposed because they play outdoors and they often bring food into contaminated areas. They are shorter than adults, which means they breathe dust, soil, and heavy vapors closer to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most important, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

NJDHSS/ATSDR evaluated the likelihood for children ingesting lead contaminated well water to be exposed to lead at levels of public health concern. Children who ingest well water containing lead at the maximum documented concentration are likely to be exposed at levels where adverse health effects are possible. Children ingesting well water at levels less than the maximum detected concentration would be at a comparatively diminished risk. However, it is prudent from the public health perspective to minimize children's exposure to lead to the greatest extent as is practical.

Interim Measures to Interrupt Human Exposure Pathways

As an interim emergency measure, the USEPA has provided an alternative water source to those residences whose potable wells exhibited levels exceeding the 15 ug/l action level (Leibig: well "G", and Zurich: well "I"). This action has served to interrupt the completed exposure pathway to lead for those residences.

Conclusions and Recommendations

Hazard Category

The Emmell's Septic Landfill site is evaluated by the ATSDR/NJDHSS to have represented a public health hazard in the past. This evaluation is based upon a completed exposure pathway associated with site-related contaminants (lead) in potable wells above the USEPA action level of 15 ug/l. The USEPA is currently engaged in the implementation of the Remedial Investigation (RI) for the ESL site which will document the sites' potential impact across environmental media. Data from the groundwater operable unit of this RI, together with ongoing monitoring of private wells in the environs of the site, and areas downgradient, will determine the potential public health implications of groundwater contamination. The potential public health hazard currently posed by the ESL site will be determined subsequent to review of available data and information.

Conclusions

- 1) The USEPA's decision to provide an alternative water source to those residences exceeding the action level of 15 ug/l for lead is consistent with protection of the public health.
- 2) While other private wells (as denoted in table 1) are not now exhibiting lead contamination at levels where immediate intervention is indicated, the presence of any lead in potable water supplies is undesirable.
- 3) While current interim measures conducted by the USEPA are justified in the context of present site data and information, future groundwater data regarding the contaminant plume migration may necessitate additional actions.

Cease/Reduce Exposure Recommendations

- 1) For those residences where the USEPA has not provided an alternative water source, residents should elect to use an alternative source for potable water. Residents should consider mitigative measures to reduce lead exposure towards the Maximum Contaminant Level Goal (MCLG) of 0 ug/l. Commercially available treatments and/or filtration systems may be employed by homeowners to reduce lead exposure to insignificant levels.
- 2) The ACHD offers a lead screening program for children. Participation in this program was offered to the residents by the ACHD during the public meeting on August 17, 1999. Those residents concerned about exposure to lead should take advantage of this program to accurately assess any potential lead exposure to their children.

Site Characterization Recommendations

The Remedial Investigation presently being implemented by the USEPA should address the issue of plume migration beyond the present study area. Of particular importance is evaluation of where additional areas of private potable wells threatened by the plume from the ESL site may be located (if any).

Public Health Action Plan

The Public Health Action Plan (PHAP) for the Emmell's Septic Landfill Site contains a description of the actions to be taken at or in the vicinity of the site. The purpose of the PHAP is to ensure that this Health Consultation not only identifies public health hazards, but provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Included is a commitment on the part of ATSDR and NJDHSS to follow-up on this plan to ensure its implementation. ATSDR will provide an annual follow-up to this PHAP, outlining the actions completed and those in progress. This report will be

placed in repositories that contain copies of this Public Health Consultation, and will be provided to persons who request it. The public health actions taken or to be implemented are as follows:

Public Health Actions Undertaken by ATSDR/NJDHSS:

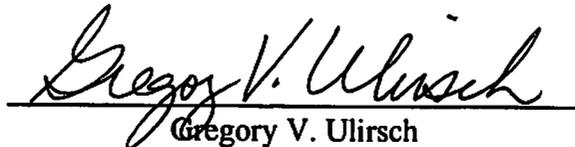
- 1) Available data and information have been evaluated by ATSDR/NJDHSS to determine public health concerns regarding potential human exposure pathways associated with the lead detected in the May 1999 private well sampling round.
- 2) The ATSDR/NJDHSS is preparing a Public Health Assessment for the ESL site which will evaluate the public health significance of data generated during past environmental investigations.

Public Health Actions Planned By ATSDR/NJDHSS:

- 1) The ATSDR and the NJDHSS will work with the USEPA to provide a public health review of future groundwater and private well data generated during ongoing site investigation and remedial activities to further evaluate the public health significance of the ESL site.
- 2) An assessment of the need for additional community education will be conducted in conjunction with, and as a supplement to those which have been implemented by the USEPA and the ACHD.
- 3) The ATSDR and the NJDHSS will reevaluate and revise the Public Health Action Plan (PHAP) as warranted. New environmental, toxicological, health outcome data, changes in conditions at the ESL site, or the results of implementing the above proposed actions may determine the need for additional actions at the ESL site by the NJDHSS and/or the ATSDR.

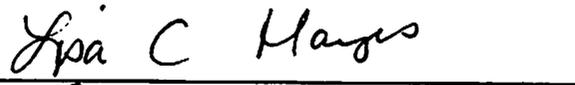
Certification

This Health Consultation was prepared by the New Jersey Department of Health and Senior Services (NJDHSS) 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 begun.



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The Division of Health Assessment and Consultation, ATSDR, has reviewed this Health Consultation and concurs with its findings.




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Documents Reviewed

- 1) USEPA. Technical Memorandum; Emmell's Septic Landfill Site. Site Activity Report. June 1988.
- 2) USEPA. Action Memorandum; Request for Approval of a Removal Action at the Emmell's Septic Landfill Site, Galloway Township, Atlantic County, New Jersey.
- 3) USEPA. Removal Site Evaluation for Emmell's Septic Landfill, Galloway Township, Atlantic County, New Jersey. September 18, 1998.
- 4) Personal Communication: Mark Payne (USEPA) to James Pasqualo (NJDHSS). Other Analytes Work Table; Emmell's Septic Landfill Site.
- 5) USEPA. Fact Sheet: Emmell Septic Landfill Superfund Site. August, 1999.
- 6) USEPA. NPL Site narrative at Listing. Emmell's Septic Landfill. April 23, 1999.
- 7) ATSDR. Toxicological Profile for Lead. August 1997.

Figure 2 - Site Detail Map.

