

PRELIMINARY  
**Health**  
**Assessment**  
**for**

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NAVAL AIR ENGINEERING CENTER

LAKEHURST, OCEAN COUNTY, NEW JERSEY

JANUARY 19, 1989

Agency for Toxic Substances and Disease Registry  
U.S. Public Health Service

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## THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104(i)(7)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR has conducted this preliminary health assessment on the data in the site summary form. Additional health assessments may be conducted for this site as more information becomes available to ATSDR.

PRELIMINARY HEALTH ASSESSMENT  
NAVAL AIR ENGINEERING CENTER  
OCEAN COUNTY  
LAKEHURST, NEW JERSEY  
January 19, 1989

Prepared by:  
Office of Health Assessment  
Agency for Toxic Substances and Disease Registry (ATSDR)

Background

The Naval Air Engineering Center site is listed by the U.S. Environmental Protection Agency (EPA) on the National Priorities List (NPL). Since the 1920s, the site has been the location of various research, maintenance, firefighter training, testing, and disposal activities conducted by the U.S. Navy. Based on information from historical records, aerial photographs, field inspections, and personnel interviews, the Navy Energy and Environmental Support Activity identified a total of 45 potentially contaminated areas at the Naval Air Engineering Center in its Initial Assessment Study. Two of the sites were removed from the list of areas requiring further investigation, because the areas were outside the scope of work. In the U.S. Navy's procedure of investigating environmental contamination, the next step is to conduct a Confirmation Study, which focuses on confirming the presence and source of contamination, assessing its vertical and horizontal extent, and assessing its potential for migration.

There is unlimited access to the site.

The following documents were provided to ATSDR for review: Analytical Results of Groundwater Samples at Lakehurst NAEC (Princeton AquaScience), July 30, 1981; Lakehurst NAEC FIT Evaluation of Navy Preliminary Assessment, November 11, 1983; Annual Report of the Groundwater Monitoring Program at the Closed Waste Facilities, April 1985; Hazard Ranking System Package, May 15, 1984; Navy Assessment and Control of Installation Pollutants (no date); Site Investigation Confirmation Study, April 24, 1987; Regulatory Comments to the Confirmation Study, December 16, 1987; and the Proposed Work Plan, January 13, 1988. These documents form the basis of this preliminary health assessment.

Environmental Contamination and Physical Hazards

On-site environmental contamination identified to date by review of historical reports, personnel interviews, and limited sampling consists of lead (39 ppb), 1,1-dichloroethane (7 ppb), and trans-1,2-dichloroethylene (11 ppb) in non-potable water wells; arsenic (48 ppb), lead (175 ppb),

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beryllium (1 ppb), zinc (100 ppb), total cyanides (225 ppb), pyrene (6 ppb), fluoranthene (7 ppb), benzene (84 ppb), xylene (1,702 ppb), trichloroethylene (253 ppb), tetrachloroethylene (38 ppb), 1,1-dichloroethylene (5 ppb), ethylbenzene (456 ppb), carbon tetrachloride (7 ppb), toluene (10 ppb), trans-1,2-dichloroethylene (59 ppb), vinyl chloride (51 ppb), dimethyl phenols (39 ppb), 2,4-dimethyl phenol (77 ppb), methylethyl phenol (62 ppb), trimethyl benzene (310 ppb), and methylethyl benzene (834 ppb) in groundwater; hexachlorobutadiene (1 ppb), lead, 130 ppb), mercury (0.4 ppb), zinc (400 ppb), cadmium (4 ppb), and total cyanides (53 ppb) in surface water; fluoranthene (221 ppb), pyrene (230 ppb), lead (160 ppb), nickel (1 ppb), and 1,2,4-trichlorobenzene (218 ppb) in soil; and chromium (8 ppb), lead (170 ppb), mercury (0.4 ppb), nickel (2 ppb), antimony (170 ppb), arsenic (10 ppb), and beryllium (0.4 ppb) in stream sediment.

It is important to note that the above data are 1) summarized according to maximum reported concentration in the environmental media mentioned, 2) are not uniformly distributed across the base, and 3) all are not present at each individual area within the site.

Off-site environmental contamination has not been assessed completely to date. Some off-site contamination has been documented (benzene and methylene chloride in groundwater, believed to originate from a gasoline station).

Physical hazards reported to be present at this site include plutonium-238 (91 pCi/L), and gross alpha and beta radioactivity (228 pCi/L and 167 pCi/L, respectively) in groundwater; gross alpha and beta radioactivity (55 and 28 pCi/L, respectively) in surface water; cesium-137 (0.4 pCi/g), radium-226 (0.4 pCi/g), thorium-232 (0.3 pCi/g), and gross alpha and beta radioactivity (9 and 3 pCi/g, respectively); and gross alpha and beta radioactivity (17 and 8 pCi/g, respectively) in stream sediment. However, all radiologic data is suspect for QA/QC reasons. Additional sampling is to be performed in the RI to verify these concentrations.

### Potential Environmental and Exposure Pathways

The potential environmental pathways of concern are contaminated groundwater, surface water, soil, and sediment. The potential human exposure pathways are ingestion of contaminated groundwater, ingestion and dermal contact with soils, sediments, and surface waters both on- and off-site.

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### Demographics

No information is presented concerning the demographics of any potentially exposed human populations. It is known, however, that the base employs 4,800 people, and 1,370 live on-base. These 1,370 are mostly trainees present for approximately six months for training purposes.

### Evaluation and Discussion

This site is in the preliminary stages of investigation by a contractor for the U.S. Navy. Conclusions reached by the Navy from the presently available data are that radioactivity levels are no greater than background for that area, surface water and sediment contamination has not reached off-site locations, and drinking water wells on-site are not contaminated. It was also concluded that surficial soils and stream water and sediment for the most part are free of significant contamination. These conclusions are contested by EPA.

From the discussion presented in the review documents of the type of disposal practices employed at the various areas within the site, which took place for almost 60 years, and the volume of wastes disposed of (estimated to be two million gallons in one area alone), it does not seem conceivable that there is no significant surficial contamination and the on-site groundwater contamination is as limited as suggested, and that the groundwater off-site has not become contaminated. The usual result of disposal of liquid solvents in unlined pits and lagoons, dumping wastes freely on the ground, de-dusting areas with waste oils, and similar practices is that contaminants migrate into groundwater and are spread by surface water, wind, and human activity.

ATSDR has prepared, or will prepare, Toxicological Profiles on the site contaminants (with the exception of pyrene, methylethyl benzene, plutonium, cesium, radium, thorium, antimony, and methylethyl phenol) noted above.

### Conclusions and Recommendations

Based on the available information, this site is considered to be of potential public health concern because of the risk to human health caused by the possibility of exposure to hazardous substances via contaminated groundwater, soil, sediment, and surface water. Further investigation into the extent of groundwater contamination on-site and off-site is needed. The location and depths of monitoring wells should be evaluated by EPA to determine if they are appropriate to evaluate contaminant migration from the suspect areas. It is our understanding that these activities are being performed.

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Potentially affected populations, both on- and off-site need to be identified, including the uses of groundwater in the area by those populations, domestic and municipal well locations, the degree of contact with on-site surface contamination, the degree of contact with any contaminated off-site soils and sediments, and the degree of use of any surface water bodies for swimming and fishing.

Further environmental characterization and sampling of the site and impacted off-site areas during the Remedial Investigation and Feasibility Study (RI/FS) should be designed to address the environmental and human exposure pathways discussed above. When additional information and data become available, e.g., the completed RI/FS, such material will form the basis for further assessment by ATSDR at a later date.