

**EPA Superfund  
Record of Decision:**

**NEW LONDON SUBMARINE BASE  
EPA ID: CTD980906515  
OU 06  
NEW LONDON, CT  
09/18/1997**

RECORD OF DECISION

SOURCE CONTROL OPERABLE UNIT  
SPENT ACID STORAGE AND DISPOSAL AREA

NAVAL SUBMARINE BASE - NEW LONDON  
GROTON, CONNECTICUT

AUGUST 1997

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**DECLARATION FOR THE  
RECORD OF DECISION**

**Site Name and Location:**

Spent Acid Storage and Disposal Area ("SASDA")  
Naval Submarine Base ("NSB") - New London  
Groton, CT

**Statement of Basis and Purpose:**

This document presents the no further action decision for the soils at the SASDA at the NSB in Groton, CT. Groundwater at the SASDA will be addressed as part of the basewide groundwater management strategy for the NSB as part of a separate ROD. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA") as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA") (42 U.S.C. Subsection 9601 et seq.) and the National Contingency Plan ("NCP") (40 C.F.R. Part 300). This decision document is based on the Administrative Record for the sites, which is located in the Naval Submarine Base library at NSB, Groton, CT.

The Connecticut Department of Environmental Protection concurs with the selected remedy (see Appendix A).

**Description of the Selected Remedy:**

No further action is necessary to protect human health and the environment.

**Declaration Statement:**

No further remedial action is necessary to ensure protection of human health and the environment at the SASDA. A previous removal action eliminated the need to conduct additional remedial action. No 5-year reviews are necessary. The foregoing represents a determination by the U.S. Navy and the U.S. Environmental Protection Agency that no remedial action is necessary under CERCLA at the SASDA.

Concur and recommended for immediate implementation:

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## DECISION SUMMARY

### I. SITE NAME, LOCATION, AND DESCRIPTION

The United States Navy Submarine Base - New London ("NSB") was placed on the National Priorities List ("NPL") on August 30, 1990 by the United States Environmental Protection Agency ("EPA") pursuant to the Comprehensive Environmental Response and Liability Act ("CERCLA") of 1980. There are several sites within NSB that are being addressed by CERCLA. This Record of Decision ("ROD") relates to soil at the Spent Acid Storage and Disposal Area ("SASDA") within the NSB.

The NSB consists of approximately 547 acres of land and associated buildings in southeastern Connecticut in the towns of Ledyard and Groton. NSB is situated on the east bank of the Thames River, approximately 6.0 miles north of Long Island Sound, and is bounded to the east by Connecticut Route 12, to the south by Crystal Lake Road, and to the west by the Thames River. The northern border is a low ridge that trends approximately east-southeast from the river. Figures 1-1 and 1-2 show the NSB location and the SASDA location, respectively.

NSB currently provides a base command for naval submarine activities in the Atlantic Ocean. Additionally, NSB includes housing for Navy personnel and their families, submarine training facilities, military offices, medical facilities, and facilities designed for the maintenance, repair, and overhaul of submarines.

Land use adjacent to the NSB is generally residential or commercial. Residential developments border the NSB to the north and extend north into the Gales Ferry section of Ledyard. Property along Route 12 to the east of the NSB consists of widely spaced private homes and open, wooded land. Further south on Route 12, development is a mixture of commercial and residential properties that include automobile sales and repair facilities, convenience stores, restaurants, a church, and a gasoline station. Private residences and an automobile service station are located along the south side of the NSB along Crystal Lake Road; further south is housing for Navy personnel.

The Groton Water Department supplies potable water to NSB. The primary sources of the Groton water supply are reservoirs that are supplemented with wells. The water supplies are located within the Poquonock River Watershed, located east of NSB, which is not within the NSB watershed. Groundwater at NSB is not used for potable water.

The land around NSB consists of a series of low bedrock ridges that trend generally north to south. Lowlands between the ridges are commonly wetlands and poorly drained stream valleys.

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The topography of NSB is dominated by bedrock ridges in the northern (elevation 180 feet mean sea level ["MSL"]) and central (elevation 230 feet MSL) portions of the NSB, as well as an off-site ridge (Baldwin Hill, elevation 245 feet MSL) to the east. The low-lying area (elevation 50 feet MSL) between these ridges slopes to the west (USGS, 1984). The Thames River adjacent to the west of NSB is flanked by glacially-derived terrace deposits and more recent flood-plain deposits.

The SASDA is located in the southeastern section of NSB. The SASDA is a tank that was used for temporary storage of waste battery acid before and after World War II. The batteries were placed on a concrete pad next to the tank where some acid occasionally leaked. The SASDA is located in a paved parking lot in a well-developed portion of the NSB. The tank is 4 feet high by 4 feet wide by 12 feet long. The former tank and the surrounding soils encompass approximately 1000 square feet.

A removal action was completed in January 1995. The tank, 318 tons (200 cubic yards) of lead contaminated soil, contaminated pavement, and the tank contents were removed. The excavated area was backfilled with clean borrow and covered with bituminous pavement. A risk assessment was performed as part of the Phase II RI for the groundwater and the soils remaining in place (see Section VI).

### II. SITE HISTORIES AND ENFORCEMENT ACTIVITIES

#### A. Site History

In 1867, the state of Connecticut donated a 112-acre parcel on the east bank of the Thames River to the Navy. The Navy began using the property in 1868 when it was officially designated as a Navy Yard. The property was then used as a mooring site for small craft and obsolete warships, and as a coaling station for the Atlantic fleet.

The Navy designated the site a Submarine Base in 1916. During World War I, facilities at the base were expanded extensively; 6 piers and 81 buildings were added. In 1917, a submarine school was established and the Submarine Medical Center was founded one year later.

NSB experienced another period of growth during World War II. Between 1935 and 1945 the Navy built in excess of 180 buildings and expanded NSB from 112 to 497 acres through the acquisition of adjacent land.

The growth of NSB continued after World War II. The Medical Research Laboratory was established in 1946. In 1968 the status of the Submarine School was changed from an activity to a command and became the largest tenant on the base. The Naval Submarine Support Facility was established in 1974 and the Naval Undersea Medical Institute was established in 1975. NSB currently consists of over 300 buildings on 547 acres of land (U.S. Navy, 1988).

## **B. Enforcement History**

Previous investigations and the enforcement history of the SASDA are summarized as follows:

- Installation Restoration Program ("IRP"), 1975. In response to the growing awareness of the potential effects of hazardous materials on human health and the environment, the Department of Defense ("DOD") developed the IRP to investigate and clean up potential problem areas created by past events at federal facilities. The IRP was the catalyst for environmental investigations at the NSB. All environmental investigations performed to date at SASDA have been conducted under the IRP.
- Initial Assessment Study ("IAS"). Envirodyne Engineers, Inc. (Envirodyne), 1982. The purpose of the IAS was to identify and evaluate past hazardous waste disposal practices at NSB and to assess the associated potential for environmental contamination. Envirodyne recommended further investigation and testing of areas, including the SASDA in the IAS report.
- Verification Study, Wehran Engineering, Inc., 1988. The purpose of the Verification Study was to determine whether toxic and hazardous materials identified in the IAS were present on site, and to further assess the potential impact of the contamination on human health and the environment. The presence of hazardous contaminants at SASDA was confirmed during this study.
- NSB is Placed on the National Priorities List ("NPL") by the EPA, 1990. SASDA was included among the list of sites of concern.
- Phase I Remedial Investigation ("RI") NSB, Atlantic Environmental Services, Inc., 1992. SASDA was identified as one of several NSB sites posing potential risks to human health and the environment.
- Federal Facility Agreement ("FFA") for NSB, January 5, 1995. The Navy entered into an FFA with EPA and the Connecticut Department of Environmental Protection ("CTDEP") regarding the cleanup of environmental contamination at NSB. The FFA establishes the roles and responsibilities of each agency, sets deadlines for the investigation and cleanup of hazardous waste sites, and establishes a mechanism for the resolution of disputes among the agencies.
- Focused Feasibility Study ("FFS"), Atlantic, February 4, 1994. The FFS offers descriptions and evaluations of remedial alternatives considered for the SASDA. The FFS for SASDA considered all relevant supplemental data from the Draft Phase I RI in the evaluation of risk and remedial alternatives.
- Final Report for Soil Remediation, Spent Acid Storage and Disposal Area, OHM Remediation Services Corporation, September 1995. The post-removal report summarized the soil excavation activities and documented soil concentrations remaining at the site. Leachability tests were also reported.
- Phase II Remedial Investigation ("RI"), Brown & Root Environmental, March 1996. Work performed during the Phase II RI addressed and filled data gaps from the Phase I RI and previous investigations in order to further delineate the extent and degree of contamination. A quantitative risk assessment indicated that no threats to human health or the environment exist at the SASDA.

### III. COMMUNITY PARTICIPATION

Throughout the history of the contamination investigations and enforcement activities at NSB, the community has been involved. The Navy has kept community members and other interested parties aware of site activities through informational meetings, published fact sheets and information updates, press releases, public meetings, and Restoration Advisory Board (RAB) meetings.

The Technical Review Committee was established in 1988 and was later (late 1994) reorganized and renamed the RAB. The RAB has been an important vehicle for community participation in the NSB IRP. The RAB consists of representatives of the U.S. Navy, EPA, CTDEP, planners and officials of neighboring towns, Navy and EPA contractors, and local residents with scientific knowledge of or interest in the sites. The RAB meets regularly to review technical aspects of the NSB IRP and provides a mechanism for community input to the program.

To ensure that the community is well informed about NSB IRP activities, the Navy has provided and will continue to provide the public with the following sources or vehicles of information.

- Public Information Repositories. The Public Libraries in Groton and Ledyard, and the Naval Submarine Base - New London are the designated information repositories for the Subbase IRP.
- Key Contact Persons. The Navy has designated a Public Affairs Officer as an information contact for the Subbase. Their addresses and phone numbers are included in all information materials distributed to the public, including any fact sheets or press releases. The Public Affairs Officer maintains the site mailing list to ensure that all interested individuals receive more pertinent information on the IRP activities. Representatives from the Navy, EPA, and the Connecticut Department of Environmental Protection attend all public meetings and hearings.
- Mailing List. To ensure that information materials reach the individuals who are interested in or affected by the IRP activities at the Subbase, the Navy maintains and regularly updates a mailing list of interested persons. Anyone interested in being placed on the list can do so by contacting the Subbase Public Affairs Officer.
- Regular Contact With Local Officials. The Navy meets regularly to discuss the status of the IRP with the RAB, which includes representatives from neighboring towns. The Navy contacts other town officials as-needed.
- Press Releases and Public Notices. The Navy continues to issue press releases to local media sources to announce public meetings and comment periods, the availability of the IRP reports and plans, and to provide general information updates when and as the Public Affairs Officer sees fit.
- Public Meetings. The Navy holds informal public meetings as needed to keep residents and town officials informed about IRP activities at the Subbase, and of significant milestones in the IRP. The meetings include presentations by Navy technical staff, EPA personnel, and/or support contractors for both agencies. The meetings also include a question-and-answer period. Minutes of meetings during public comment periods are included in the Administrative Record for public reference.
- Fact Sheets and Information Updates. The Navy has developed a series of fact sheets that are mailed to interested individuals and used as handouts at the public meetings. Each fact sheet includes a schedule of upcoming meetings and other site activities. The fact sheets may explain why the Navy is conducting certain activities or studies, update readers on potential health risks, or provide general information on the IRP process.

A detailed formal NSB Community Relations Plan was published in February of 1994. The plan identifies issues of community interest and concern regarding the NSB. The plan also describes a program of community relations activities that the Navy will conduct during the IRP.

The activities of the community relations program outlined in this plan have the following specific objectives: (1) to keep local officials, citizens, military personnel, and the media informed of site activities; (2) to increase community awareness of the goals and procedures of the IRP; and (3) to provide opportunities for public involvement in the cleanup process.

The information in the Community Relations Plan is based upon:

- interviews with area residents and local officials conducted in Groton and Ledyard on October 2-3, 1991;
- interviews with area residents and local officials conducted by phone in September and October of 1991;
- input of the TRC or RAB which had regularly met to discuss progress at the Subbase;
- public comments and questions at public information meetings held in 1990 and 1991;
- review of Navy site files; and
- discussions held with Navy, EPA, contractors, and technical and public affairs staff.

The Navy held several meetings to inform the public about the SASDA investigations, studies, and cleanup plans. These meetings occurred on February 12, 1997 and May 14, 1997 in Groton, CT.

The public comment period on the SASDA Proposed Plan closed on August 4, 1997. An informational meeting and the public hearing were held on July 10, 1997.

#### **IV. SCOPE AND ROLE OF RESPONSE ACTION**

Actual or threatened releases of hazardous substances from this site do not present an imminent or substantial endangerment to public health, welfare, or the environment. Unacceptable exposures to hazardous substances from this site will not occur. As a result, the method chosen for remediation of soils at the SASDA is no action.

#### **V. SUMMARY OF SITE CHARACTERISTICS**

The nature and extent of soil and groundwater contamination detected at the SASDA are summarized herein. Complete discussions of the characteristics and contaminants at the site can be found in the Phase I and Phase II Remedial Investigation Reports (Atlantic, August 1992 and Brown & Root Environmental, March 1996, respectively), the Draft Focused Feasibility Study (Atlantic Environmental Services, March 1994), and the post-removal report (OHM Remediation Services Corporation, September 1995). The sources of contamination detected at the SASDA are predominantly from storage of batteries. Soil contaminants detected are summarized in Section VI, and include lead and PAHs. No areas of soil contamination were identified that present risks. Remediation of groundwater will not be addressed in this effort, but will be evaluated as part of the basewide groundwater management strategy in a separate ROD.

The Thames River is the closest surface water body and is approximately 1500 feet away. The groundwater at the NSB is not used for human consumption. The NSB is supplied by the town public water supply. The groundwater at NSB is classified as GB.

A removal action was completed in January 1995. The tank, 318 tons (200 cubic yards) of lead contaminated soil, contaminated pavement, and the tank contents were removed. Preliminary remediation goals were set at 500 mg/kg lead in the soils and 5 mg/l lead in the TCLP leachate. The lead concentration in the soils remaining in place ranges from 6.13 mg/kg (composite of three samples from north wall) to 432 mg/kg (composite of five samples from south wall); TCLP lead concentrations ranged from 0.018 mg/l (composite of three samples from north wall) to 3.32 mg/l (composite of six samples from the bottom). The excavated area was backfilled with clean borrow and covered with bituminous pavement.

A risk assessment was performed as part of the Phase II RI for the groundwater and the soils remaining in place and is discussed in Section VI below.

#### **VI. SUMMARY OF SITE RISKS**

A Risk Assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants present in soils at the SASDA. The public health risk assessment followed a four step process: (1) contaminant identification, which identified those hazardous substances that were of concern at the site; (2) exposure assessment, which identified actual or potential exposure pathways; and (3) risk characterization, which integrated the two earlier steps to summarize the potential and actual non-carcinogenic and carcinogenic risks posed by hazardous substances at the site.

Cancer risks are expressed in terms of predicted additional cases of cancer in an exposed population over a lifetime. For example, 2.7 additional cancer cases in 100,000 individuals would be expressed as  $2.7 \times 10^{-5}$ . Superfund selects remedies that reduce the threat from carcinogenic contaminants at each site such that the excess risk from any medium to an individual exposed over a lifetime generally falls within a range from 1 in 10,000 ( $10^{-4}$ ) to 1 in 1,000,000 ( $10^{-6}$ ).

Non-carcinogens are assumed to have a threshold below which health effects are not initiated. This threshold, or reference dose, is the estimated highest average daily exposure to humans over a lifetime unlikely to cause adverse health effects. Because the reference dose reflects the acceptable dose below which no adverse health effects would be expected, any observed dose below the reference dose is considered acceptable. By comparing the reference dose to the dose from a particular area, a Hazard Index can be calculated. If the Hazard Index is less than one, the dose is considered safe. If the Hazard Index is one or greater, then adverse health effects may be likely, with the likelihood increasing as the Hazard Index increases.

As described in the following sections, all risks evaluated for exposure to SASDA soils were acceptable. Remediation of groundwater will not be addressed in this effort, but will be evaluated as part of the basewide groundwater strategy.

Contaminant Identification: The SASDA is one of several sites under evaluation at the NSB. A base-wide list of chemicals was developed to ensure that chemicals were consistently evaluated from location to location even though some of the chemicals included on the list may not have been detected at a particular location. From this list, contaminants of concern were identified. The contaminants of concern for the soils at the SASDA are polyaromatic hydrocarbons, aluminum, antimony, arsenic, beryllium, cadmium, iron, lead, and manganese.

Exposure Assessment: Based on information obtained through site visits, inspections, and discussions with personnel involved in future plans for the area, construction workers and future residents were identified as potential receptors.

Risk Characterization: The results of the risk assessment for each scenario are presented in Table 6-1.

**Table 6-1: Summary of the Risk Assessment for the SASDA**

Exposure Route	Hazard Index				Incremental Cancer Risk			
	Construction worker		Future resident		Construction worker		Future resident	
	RME	CTE	RME	CTE	RME	CTE	RME	CTE
Incidental Ingestion of Soil	1.2E-1	1.1E-2	8.5E-2	1.3E-2	9.4E-7	6.2E-8	2.0E-5	6.2E-7
Dermal Contact with Soil	3.0E-2	3.8E-4	4.9E-2	9.5E-4	-	-	-	-
Dermal Contact with Groundwater	4.7E-1	1.1E-1	3.5E-1	5.7E-2	5.8E-7	1.4E-7	2.9E-5	1.5E-6
Ingestion of Groundwater	NA	NA	3.1E+0	6.4E-1	NA	NA	1.3E-4	7.8E-6
Inhalation of Volatiles in Groundwater	NA	NA	3.4E-2	5.1E-3	NA	NA	5.0E-6	3.0E-7
Cumulative Risk	6.2E-1	1.2E-1	3.6E+0	7.2E-1	1.5E-6	2.0E-7	1.8E-4	1.0E-5

**Human Health Risk Assessment:**

Non-cancer: The highest non-cancer Hazard Index was 3.6 and corresponds to a RME future resident. Groundwater ingestion was the predominant contributor to this risk and was driven by manganese. Dermal contact with groundwater also contributed to this risk and the RME for the Construction worker scenario.

Cancer: The highest cancer risk estimated was for a RME future resident (1.8E-04). Groundwater ingestion risks were the predominant contributor and were largely driven by beryllium (8.0E-05). It is important to note, however, that this risk is based on one detection of beryllium (1.5 Ig/l) out of 11 analyses.



Ecological Risk Assessment:

Ecological risks were not evaluated because the SASDA does not represent a habitat suitable for supporting a wildlife population. Ecological risks at the SASDA were assumed to be negligible largely owing to the small size of the site and the fact that the entire surface of the site is paved.

**VII. VOLUNTARY ACTIONS**

In June 1997, the Connecticut Department of Environmental Protection collected 16 soil samples at the SASDA. These soil samples were evaluated using the Synthetic Precipitation Leachate Procedure to determine whether residual lead present in the soils could leach into the groundwater. All the samples indicated that residual lead present at the SASDA will not leach into the groundwater.

**VIII. DOCUMENTATION OF NO SIGNIFICANT CHANGES**

The Navy presented a proposed plan for the remediation of SASDA on July 3, 1997. Based on the previous response action and the risk assessment, the Navy believes that no further action is required at the SASDA.

The final remedy selected, as described in this document, does not differ significantly from the proposed plan.

**VIV. STATE ROLE**

The CTDEP has indicated its support for the selected remedy. The CTDEP concurs with the selected remedy for the SASDA. A copy of the declaration of concurrence is attached as Appendix A.

**APPENDIX A**

**DECLARATION OF CONCURRENCE**

<IMG SRC 97162D>

September 15, 1997

Mr. Harley Laing, Director  
United States Environmental Protection Agency, Region 1  
Office of Site Remediation and Restoration  
JFK Federal Building (HAA)  
Boston, MA 02203-2211

Captain R. N. Nestlerode,  
Commanding Officer  
Naval Submarine Base New London  
BOX 00  
Groton, CT 06349

Re: State Concurrence with No Further Action Remedy, Spent Acid Storage and Disposal Area  
Naval Submarine Base New London. Groton. Connecticut

Dear Captain Nestlerode and Mr. Laing:

The Connecticut Department of Environmental Protection (CTDEP) concurs with the no further action decision for soils at the Spent Acid Storage and Disposal Area (SASDA) at the Naval Submarine Base New London in Groton, Connecticut. The no further action decision for soils is described in detail in the proposed plan dated July 1997.

The Navy removed the spent acid storage tank and its contents in January 1995, together with lead contaminated pavement and approximately 318 tons of lead contaminated soil. In order to determine whether any soil remained at the site with contaminant concentrations exceeding the Pollutant Mobility Criteria (PMC) specified in the State's Remediation Standard Regulations (RSRs), the State collected additional soil samples at the site in June 1997. The State analyzed these samples for lead by the Synthetic Precipitation Leachate Procedure (SPLP).

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## APPENDIX B

### RESPONSIVENESS SUMMARY

The Navy published a notice and brief analysis of the Proposed Plan in the New London Day on July 3, 1997 and made the plan and the administrative record available to the public at the Groton Public Library, the Bill Library and the Naval Submarine Base Library.

On July 10, 1997, the Navy held an informational meeting to discuss and present the Proposed Plan. Also, on July 10, 1997 the Navy held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting is included in this responsiveness summary. From July 3, 1997 to August 4, 1997 the Navy held a 30-day public comment period to accept public comment on the Proposed Plan.

#### Summary of Comments Received During the Public Comment Period

During the public hearing held on July 10, 1997 one comment was received. During the public comment period one set of comments, dated July 11, 1997 from the Connecticut Department of Environmental Protection (CTDEP) was received.

1. Comment: One citizen commented at the public hearing that he was pleased to see that sited on the base have finally completed the appropriate environmental cleanup.

Response: The Navy is also pleased that environmental progress is underway and appreciates the public's recognition of this. As explained in Section V of the ROD, the 1995 removal action eliminated the need for further remedial response.

2. Comment: On July 11, 1997, the Connecticut Department of Environmental Protection ("CTDEP") stated that they "...can support the Navy's determination that no further remedial action is warranted at the SASDA..." because compliance with the State's Remediation Standard Regulations has been demonstrated.

Response: Additional soil samples were collected by the CTDEP in June 1997 and analyzed using SPLP to determine whether the removal action conducted by the Navy in January 1995 removed all soil with the potential to leach lead at levels in excess of the PMC. The Navy appreciates the State's sampling effort and is pleased that this effort resolved the potential conflict between the Navy and CTDEP.