

Environmental Baseline Survey

Naval Station Puget Sound (NAVSTA PS), Seattle
Seattle, Washington
CTO 0104

Revision Date:
January 16, 1996

NORTHWEST AREA

COMPREHENSIVE
LONG-TERM
ENVIRONMENTAL
ACTION NAVY

ENGINEERING FIELD ACTIVITY
NORTHWEST, NAVAL FACILITIES
ENGINEERING COMMAND
CONTRACT #N62474-89-D-9295



THE URS TEAM

URS Consultants

Science Applications
International Corp.

Shannon & Wilson, Inc.

ENVIRONMENTAL BASELINE SURVEY

FOR THE

**COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY
(CLEAN) CONTRACT, NORTHWEST AREA**

**NAVAL STATION PUGET SOUND (NAVSTA PS), SEATTLE
SEATTLE, WASHINGTON
CONTRACT TASK ORDER 0104**

**PREPARED BY:
URS CONSULTANTS, INC.
SEATTLE, WASHINGTON**

**PREPARED FOR:
ENGINEERING FIELD ACTIVITY, NORTHWEST
SOUTHWEST DIVISION, NAVAL FACILITIES ENGINEERING COMMAND
POULSBO, WASHINGTON**

**REVISION DATE:
JANUARY 16, 1996**

ENVIRONMENTAL BASELINE SURVEY
U.S. Navy CLEAN Contract
Engineering Field Activity, Northwest
Contract No. N62474-89-D-9295
CTO 0104

Title Page
Revision No.: 3
Date: 01/16/96
Page iii

ENVIRONMENTAL BASELINE SURVEY
TITLE PAGE

Document Title: Environmental Baseline Survey
Navy CLEAN Contract, Northwest Area

Site Name: Naval Station Puget Sound, Seattle

Site Location: Seattle, Washington

Contract Task Order: 0104

Document Control No.: 9512.052

Report Coverage: This report covers the tasks performed during the environmental baseline survey as part of the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62474-89-D-9295 for the Engineering Field Activity, Northwest, of the Southwest Division, Naval Facilities Engineering Command. These services were provided by URS Consultants, Inc., for the site listed above and described within this report.

Organization Title: Engineering Field Activity, Northwest
Address: Naval Facilities Engineering Command
19917 Seventh Avenue N.E.
Poulsbo, Washington 98370-7570
(360) 396-0239

Contractor: URS Consultants, Inc.
Address: 1100 Olive Way, Suite 200
Seattle, WA 98101
(206) 623-1800

ENVIRONMENTAL BASELINE SURVEY
U.S. Navy CLEAN Contract
Engineering Field Activity, Northwest
Contract No. N62474-89-D-9295
CTO 0104

Title Page
Revision No.: 3
Date: 01/16/96
Page iv

Approval for the Navy:

Name: Richard K. Stoll
Title: BRAC Environmental Coordinator
Naval Station Puget Sound, Seattle

Signature: _____

Date: _____

Approval for Ecology:

Name: Judith Aitken
Washington Department of Ecology

Signature: _____

Date: _____

Approval for EPA:

Name: Nancy Harney
Region 10 U.S. Environmental Protection Agency

Signature: _____

Date: _____

EXECUTIVE SUMMARY

In accordance with recommendations of the 1991 Base Closure and Realignment Commission, the Navy closed Naval Station Puget Sound (NAVSTA PS) in September 1995. This EBS was developed in accordance with Department of Defense (DoD) assessment procedures defined by the Community Environmental Response Facilitation Act (CERFA). The purpose of the EBS was to collate existing environmental data and information in order to identify current environmental conditions. This EBS document is the final revision and reflects environmental conditions as of the date the base closed, September 28, 1995.

NAVSTA PS, Seattle, is located northeast of downtown Seattle on the western shore of Lake Washington. Currently occupying 151 acres, the site historically has been used by the Navy for the overhaul and repair of aircraft. Operations at the site began in the late 1920s, and during the height of operations the base occupied more than 400 acres. The base is comprised of 63 separate buildings and facility support structures. All buildings are empty as a result of base closure actions.

Several environmental investigations were performed at NAVSTA PS, Seattle, during the period 1988 to 1995. Results of these investigations are documented in a series of technical memoranda that are identified in Section 2. Following is a summary of environmental issues:

- Lead-based paint is present in 18 out of 19 buildings surveyed. Chipping and peeling paint was abated from three homes expected to house children.
- Asbestos is present in 73 non-housing buildings surveyed. Friable asbestos identified in 12 of the buildings was abated.
- PCBs are present in some roofing materials, but abatement is not required.
- Subsurface soils near Building 137, a former drycleaning operation, contain petroleum hydrocarbons used for drycleaning at concentrations that exceed Model Toxics Control Act (MTCA A) cleanup levels. No hydrocarbons were detected in nearby groundwater monitoring wells. Remedial action will be limited to a deed restriction.

- Soils under the floor of Building 2 contain metals exceeding MTCA B cleanup levels. Remedial action will be limited to a deed restriction.
- Initial monitoring of groundwater at one location on the former avgas tank farm, where 3,800 cubic yards of soils were removed, indicates concentrations of diesel slightly exceed MTCA A cleanup levels. Wells will be sampled again in January 1996. If concentrations are still higher than MTCA A cleanup levels, additional monitoring and/or a deed restriction may be required.
- Based on bioassay results, use of Sand Point shoreline adjacent to NOAA will be restricted to current uses.

In accordance with CERFA, properties within NAVSTA PS, Seattle, were placed into one of seven environmental risk categories. Each successive category indicates an increased probability that additional action is needed to mitigate a potential hazard. Of the NAVSTA PS, Seattle, facilities that have been assessed, most have been assigned a classification number of 2 or 3, which means that hazardous materials or petroleum products were stored in these areas at one time but no further remedial action is necessary. Table ES-1 summarizes each risk classification and lists the buildings and areas at NAVSTA PS, Seattle, that are included in each category.

Table ES-1
 Environmental Risk Classifications

| Classification (Based on the information/documentation available at the time of the survey) | Classification Number | Buildings/Areas |
|---|--------------------------|---|
| Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). | 1 | Bldgs. 44, 204, 222, 224, 344 |
| Areas where only storage of hazardous substances or petroleum products has occurred (but no release, disposal, or migration from adjacent areas has occurred). | 2 | Bldgs. 2, 5, 6, 9, 11, 12, 15, 18, 25, 27, 29, 30, 38/138, 40, 41, 47, 193, 223, 244, 310, 345, 406, 407, and 3 USTs (Nos. 29, 345, 403) |
| Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but at concentrations that do not require a removal or a remedial action. | 3 | Bldgs. 67, former Bldg. 137, stormwater outfall area, 100,000-gallon UST, avgas line under tarmac east of Bldg. 11, and former plating shop area of Building 2. |
| Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, and all remedial actions necessary to protect human health and the environment have been taken (including use of deed restrictions). | 4 | Bldg. 98, Auto Hobby Shop (Bldg. 310), pesticide residue tank (Tank 206), former equipment shed (Bldg. 206), former avgas/mogas tank farm and sewage treatment facilities, Tanks 12A, 12B, 12C, 12D, 2, 310A, 340A, 340B, and 340C, and brig UST (No. 406). Tanks 166, 167, 168, 169, 143, 144, and 145 |
| Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, removal and/or remedial actions are under way, but all required remedial actions have not yet been taken. | 5 | None |
| Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not yet been implemented. | 6 | None |

Table ES-1 (Continued)
Environmental Risk Classifications

| Classification (Based on the information/documentation available at the time of the survey) | Classification Number | Buildings/Areas |
|---|--------------------------|--|
| Areas that have not been evaluated. | 7 | Bldgs. 26N, 26S, 31, 42, 69, 109, 119, 192, 195, 228, 275, 299, 307, 308, 330, 331, 332, 333, 334, 342, 401, 402, 404, 408, 409. |

CONTENTS

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| EXECUTIVE SUMMARY | v |
| ABBREVIATIONS AND ACRONYMS | xiii |
| 1.0 INTRODUCTION | 1-1 |
| 2.0 SURVEY METHODOLOGY | 2-1 |
| 3.0 SITE BACKGROUND | 3-1 |
| 3.1 SITE HISTORY AND CURRENT USE | 3-1 |
| 3.2 ENVIRONMENTAL SETTING | 3-2 |
| 3.2.1 Surface Water | 3-2 |
| 3.2.2 Groundwater | 3-2 |
| 3.3 POPULATION | 3-5 |
| 3.4 BIOLOGICAL RESOURCES | 3-5 |
| 3.4.1 Vegetation | 3-5 |
| 3.4.2 Wildlife | 3-6 |
| 3.4.3 Threatened or Endangered Species | 3-6 |
| 4.0 ENVIRONMENTAL ISSUES | 4-1 |
| 4.1 BASE-WIDE ISSUES | 4-1 |
| 4.1.1 Hazardous Materials Storage | 4-1 |
| 4.1.2 Solid/Hazardous Waste Disposal | 4-1 |
| 4.1.3 Stormwater | 4-2 |
| 4.1.4 Wastewater/Sewage | 4-2 |
| 4.1.5 Drinking Water | 4-4 |
| 4.1.6 Asbestos | 4-4 |
| 4.1.7 Lead-Based Paint | 4-8 |
| 4.1.8 PCBs | 4-8 |
| 4.2 AREA-SPECIFIC ISSUES | 4-8 |
| 4.2.1 Former Laundry (Building 137) | 4-11 |
| 4.2.2 Marine Corps Reserve Center (Building 2) | 4-11 |

CONTENTS (Continued)

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| 4.2.3 Pesticide Residue Tank (Building 206) | 4-12 |
| 4.2.4 Public Works Transportation Building (Building 67) | 4-13 |
| 4.2.5 Auto Hobby Shop (Building 310) | 4-13 |
| 4.3 TANK AND PIPING ISSUES | 4-14 |
| 4.3.1 Avgas Storage and Piping | 4-14 |
| 4.3.2 Mogas Storage | 4-16 |
| 4.3.3 Underground Storage Tanks | 4-17 |
| 4.3.4 100,000-Gallon UST (Tank 12C) | 4-18 |
| 5.0 FINDINGS APPLICABLE TO REGULATORY COMPLIANCE ISSUES | 5-1 |
| 5.1 RESOURCE CONSERVATION AND RECOVERY ACT | 5-1 |
| 5.2 TOXIC SUBSTANCES CONTROL ACT | 5-1 |
| 5.3 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 | 5-1 |
| 5.4 CLEAN AIR ACT | 5-1 |
| 5.5 COASTAL ZONE MANAGEMENT | 5-2 |
| 5.6 STORMWATER NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM | 5-2 |
| 5.7 WETLANDS | 5-2 |
| 6.0 SUMMARY AND PENDING ACTIONS | 6-1 |
| 6.1 BASE-WIDE OPERATIONS | 6-1 |
| 6.1.1 Hazardous Materials Storage | 6-1 |
| 6.1.2 Solid/Hazardous Waste Disposal | 6-1 |
| 6.1.3 Stormwater | 6-2 |
| 6.1.4 Wastewater/Sewage | 6-2 |
| 6.1.5 Drinking Water | 6-2 |
| 6.1.6 Lake Washington Sediments | 6-2 |
| 6.1.7 Asbestos | 6-2 |
| 6.1.8 Lead-Based Paint | 6-2 |
| 6.1.9 PCBs | 6-3 |
| 6.2 AREA-SPECIFIC ISSUES | 6-3 |
| 6.2.1 Former Laundry (Building 137) | 6-3 |
| 6.2.2 Marine Corps Reserve Center (Building 2) | 6-3 |

CONTENTS (Continued)

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| 6.2.3 Pesticide Residue Tank (Building 206) | 6-3 |
| 6.2.4 Public Works Transportation Building (Building 67) | 6-4 |
| 6.2.5 Auto Hobby Shop (Building 310) | 6-4 |
| 6.3 FUEL TANKS AND PIPING | 6-4 |
| 6.3.1 Avgas Distribution System | 6-4 |
| 6.3.2 Mogas Storage | 6-4 |
| 6.3.3 Underground Storage Tanks | 6-4 |
| 6.3.4 100,000-Gallon UST (Building 12) | 6-4 |
| 7.0 REFERENCES | 7-1 |

FIGURES

| | |
|--|------|
| 1-1 NAVSTA PS, Seattle, Vicinity and Location Map | 1-2 |
| 2-1 Site Investigation and Bioassay Sampling Locations at NAVSTA PS, Seattle . | 2-5 |
| 4-1 NAVSTA PS, Seattle, Storm Drain Discharge Locations | 4-3 |
| 4-2 NAVSTA PS, Seattle, Buildings and Former PCB Transformer Locations ... | 4-9 |
| 4-3 Avgas Line Locations | 4-15 |
| 4-4 NAVSTA PS, Seattle, Former UST Locations | 4-19 |
| 6-1 Environmental Risk Classifications, NAVSTA PS, Seattle | 6-5 |

TABLES

| | |
|---|------|
| ES-1 Environmental Risk Classifications | vii |
| 2-1 EBS Reference List | 2-2 |
| 3-1 Facility Information | 3-3 |
| 4-1 Asbestos Risk Assessment Summary | 4-5 |
| 4-2 Summary of USTs at NAVSTA PS, Seattle | 4-17 |

ABBREVIATIONS AND ACRONYMS

| | |
|--------------|---|
| avgas | aviation gasoline |
| BCP | BRAC cleanup plan |
| BRAC | Base Closure and Realignment Act of 1990 |
| bgs | below ground surface |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CERFA | Community Environmental Response Facilitation Act |
| CFR | Code of Federal Regulations |
| CLEAN | Comprehensive Long-Term Environmental Action Navy |
| CTO | Contract Task Order |
| CZM | Coastal Zone Management |
| DRMO | Defense Reutilization and Marketing Organization |
| DoD | Department of Defense |
| EBS | environmental baseline survey |
| Ecology | Washington State Department of Ecology |
| EFA NW | Engineering Field Activity, Northwest |
| EPA | United States Environmental Protection Agency |
| FOSL | finding of suitability to lease |
| FOST | finding of suitability to transfer |
| IRP | Installation Restoration Program |
| MCRC | Marine Corps Reserve Center |
| Metro | Municipality of Metropolitan Seattle |
| mg/kg | milligrams per kilogram |
| mogas | motor vehicle gasoline |
| MTCA A | Model Toxics Control Act Method A |
| MTCA B | Model Toxics Control Act Method B |
| NACIP | Navy Assessment and Control of Installation Pollutants |
| NAS | Naval Air Station |
| NAVFACENGCOM | Naval Facilities Engineering Command |
| NAVSTA PS | Naval Station Puget Sound |
| NEESA | Naval Energy and Environmental Support Activity |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |

ABBREVIATIONS AND ACRONYMS (Continued)

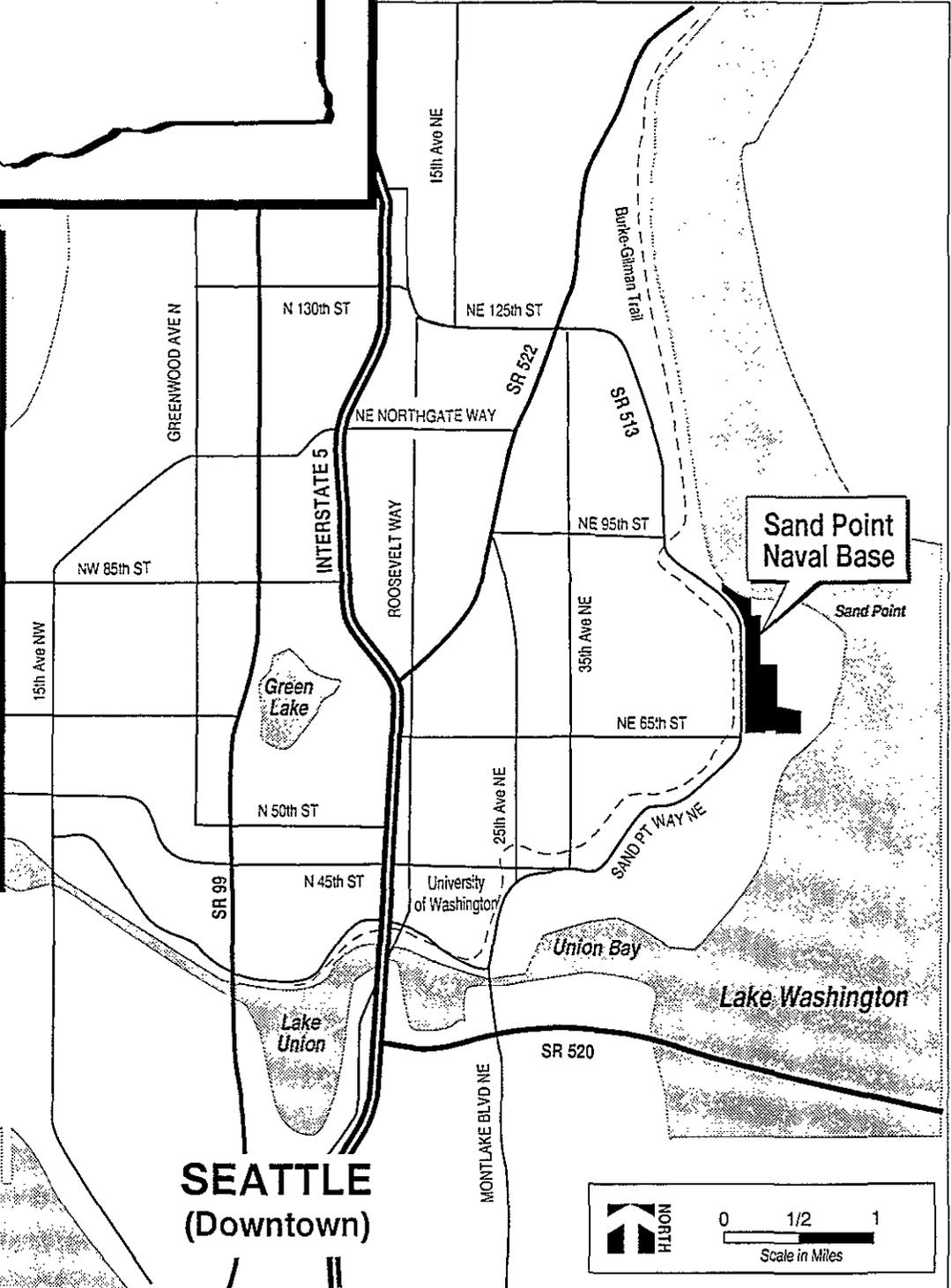
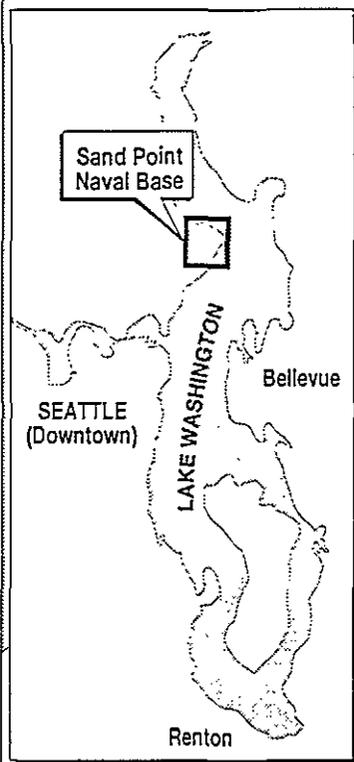
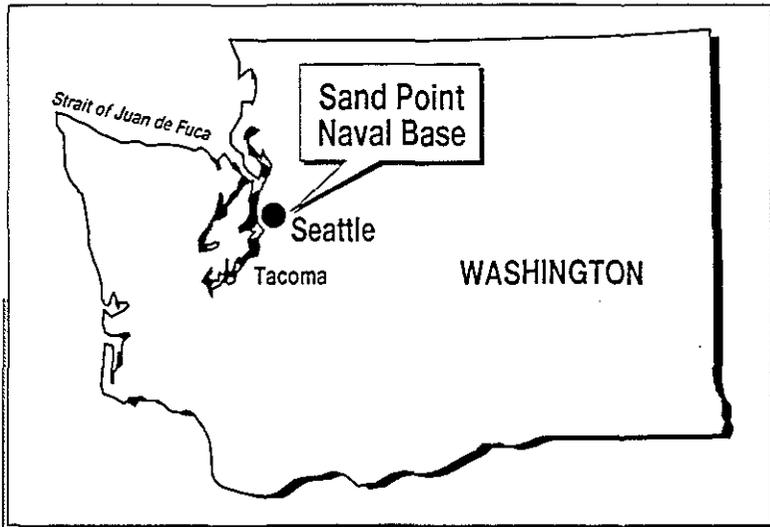
| | |
|-------|--|
| PA | preliminary assessment |
| PAH | polycyclic aromatic hydrocarbon |
| PCB | polychlorinated biphenyl |
| PCE | tetrachloroethene |
| ppm | parts per million |
| PVC | polyvinyl chloride |
| RAC | risk assessment code (for asbestos) |
| RCRA | Resource Conservation and Recovery Act |
| ROICC | Resident Officer in Charge of Construction |
| SARA | Superfund Amendments and Reauthorization Act of 1986 |
| SCS | Soil Conservation Service |
| SI | site inspection |
| SVOC | semivolatile organic compound |
| TCA | trichloroethane |
| TPH | total petroleum hydrocarbon |
| TSCA | Toxic Substances Control Act |
| URS | URS Consultants, Inc. |
| USFWS | United States Fish and Wildlife Service |
| UST | underground storage tank |
| VOC | volatile organic compound |
| WAC | Washington Administrative Code |

1.0 INTRODUCTION

The United States Navy closed Naval Station Puget Sound (NAVSTA PS), Seattle, in September 1995. NAVSTA PS, Seattle, is located in Township 25 North, Range 4 East, Section 2, in King County, Washington, and has the geographical coordinates 47°37'00" north latitude and 122°15'00" west longitude. The facility is located on the western shore of Lake Washington approximately 6 miles northeast of downtown Seattle (Figure 1-1). It is bounded by residential areas to the west and south, Lake Washington to the north, and National Oceanic and Atmospheric Administration (NOAA) facilities and Magnuson Park to the east. The facility consists of 63 buildings and facility support structures covering approximately 151 acres.

Prior to closure, a cleanup plan was developed in accordance with requirements specified under the Base Closure and Realignment Act of 1990 (BRAC). To facilitate development of the BRAC cleanup plan (BCP), the Navy contracted URS Consultants, Inc. (URS) of Seattle to conduct an environmental baseline survey (EBS) for NAVSTA PS, Seattle. This EBS report was developed in accordance with guidance provided in the *BRAC Cleanup Plan Guidebook* (DoD 1993).

The purpose of this EBS is to gather existing environmental data for NAVSTA PS, Seattle, to provide a historic overview of environmental conditions. Included in the EBS is a classification of all buildings and areas according to one of seven environmental risk categories in accordance with the Community Environmental Response Facilitation Act (CERFA). Because of its relatively small size and common environmental issues, NAVSTA PS, Seattle, has not been divided into discrete parcels for the purpose of this EBS. Information obtained for the EBS will serve as the basis for the Navy's finding of suitability to lease (FOSL) or finding of suitability to transfer (FOST).



CLEAN
 COMPREHENSIVE LONG-
 TERM ENVIRONMENTAL
 ACTION NAVY

Figure 1-1
 NAVSTA PS, Seattle, Vicinity and Location Map

CTO 0104
 NAVSTA PS, Seattle
 Seattle, Washington
 EBS REPORT

2.0 SURVEY METHODOLOGY

In preparing this report, a number of documents were reviewed as shown in Table 2-1. Information essential for this EBS, as extracted from each of these sources, is briefly summarized in the following paragraphs.

A preliminary assessment (PA) was performed in March 1988 by the Naval Energy and Environmental Support Activity (NEESA). The PA (NEESA 1988) provided a broad overview of the environmental status of NAVSTA PS, Seattle.

In May 1991, a site inspection (SI) study was conducted on the former gasoline storage area (Hart Crowser 1991). This investigation assessed site conditions in that specific area and determined whether the site should be included on the National Priorities List (NPL).

In October 1991, a supplemental PA of NAVSTA PS, Seattle, was completed (URS 1991). Areas of concern were identified by reviewing engineering drawings, site photographs, construction documents, historical aerial photographs, and environmental files. Additionally, interviews were conducted with former and current facility personnel, and several site visits were made.

Based on the conclusions and recommendations of the supplemental PA, the Navy performed a comprehensive SI (URS 1993a). This multiphased SI began in 1991 and was completed in 1993. The SI involved soil, groundwater, and freshwater sediment sampling. Recommendations from the preliminary phase of the SI were to clean and resample one of the former transformer pads and to obtain additional information about the groundwater in the vicinity of the Pesticide Control Building (Building 206) and the Public Works Building (Building 11).

In February 1993, six existing monitoring wells were resampled; one wipe sample was taken from Transformer Pad No. 42; four new soil borings were drilled and sampled around the Pesticide Control Building (Building 206); and three new soil borings were drilled and sampled around the Auto Hobby Shop (Building 310). The SI was revised in October 1993 to incorporate the results of the new soil and groundwater sampling, which indicated that levels of metals exceeded regulatory criteria (URS 1993b). These results

Table 2-1
EBS Reference List

| | |
|---|--|
| Preliminary Assessment Report Naval Station Puget Sound NEESA, March 1988 | Draft Environmental Baseline Survey URS, June 30, 1994 |
| Site Inspection Study Site 1—Former Gasoline Storage Area Naval Station Puget Sound Hart Crowser, May 15, 1991 | Draft Technical Memorandum Sampling Results for UW Property Adjacent to Auto Hobby Shop URS, September 22, 1994 |
| Preliminary Assessment PSNS-NAVSTA Puget Sound, Sand Point URS, October 10, 1991 | Draft Technical Memorandum Summer 1994 Sampling Results, Buildings 2, 30, and 137, Avgas Tank Farm, Asphalt Roofs, Ballfield URS, October 24, 1994 |
| Naval Station Puget Sound at Sand Point (history of Sand Point) United States Navy, 1992 | Base Realignment and Closure (BRAC) Cleanup Plan URS January 13, 1995 |
| Site Inspection Report (Draft Final) Naval Station Puget Sound URS, February 8, 1993 | Underground Storage Tank Closure Report for 2,000-Gallon Gasoline UST at Steam Plant URS, May 9, 1995 |
| Site Inspection Report NAVSTA PS Seattle URS, October 7, 1993 | Underground Storage Tank Closure Report for 100,000-Gallon Fuel Oil UST URS, May 9, 1995 |
| Draft Technical Memorandum Environmental Baseline Survey for Transfer Avgas Lines and 100,000-Gallon Underground Storage Tank URS, October 21, 1993 | Interim Remedial Action Report for the Former Avgas Tank Farm URS, May 9, 1995 |
| Technical Memorandum Sampling Results for the Avgas Line and 100,000-Gallon Underground Storage Tank URS, January 13, 1994 | Draft Technical Memorandum Sampling Results From the Groundwater and Soil Monitoring URS, September 7, 1995 |
| Draft Technical Memorandum Sampling Results for the Avgas Line and Auto Hobby Shop Excavation URS, April 5, 1994 | |

may have been attributed to normally occurring background levels or to the former use of the area west of Building 11 as a sewage treatment plant.

Subsurface soil investigations were conducted in the fall of 1993 that revealed no evidence of leaks in the vicinity of the 100,000-gallon underground storage tank (UST) near Building 12. However, evidence of leakage was observed around the aviation gasoline (avgas) pipeline east of Building 11 at the north end of the base (URS 1994a).

In February 1994, additional soil and groundwater samples were collected along the avgas lines and in the former avgas tank farm. Laboratory analysis of the samples indicated concentrations of total petroleum hydrocarbons—gasoline (TPH-G). Concentrations in soil samples from two locations at the former tank farm exceeded Model Toxics Control Act Method A (MTCA A) cleanup levels. Concentrations in groundwater samples from a monitoring well installed in the former tank farm also exceeded the MTCA A cleanup levels (URS 1994b).

Also, during February 1994, petroleum contaminated soils from the Auto Hobby Shop were removed. Confirmation sampling indicated that all contaminated soils exceeding cleanup levels were removed from the Navy's property. However, concentrations of total petroleum hydrocarbons (TPH) exceeded MTCA A cleanup levels on the eastern property line (URS 1994b). University of Washington student housing is adjacent to the Auto Hobby Shop. Soils on University of Washington property were sampled for TPH-G and total petroleum hydrocarbons—diesel (TPH-D) in July 1994. No TPH was detected. A draft technical memorandum was prepared in the fall of 1994 describing the sampling results (URS 1994c).

Additional sampling was conducted in July and August 1994, including the following:

- Soil samples from beneath the floor of a former plating shop in Building 2
- A soil sample adjacent to and downgradient of a former anodizing operation in Building 30
- Samples of roofing materials from three hangars to investigate unsubstantiated reports of polychlorinated biphenyls (PCBs) in roofing materials
- Soil samples from the ballfields to assess the impact of a drainage system

- Soil samples from beneath the floor of a former drycleaning operation in Building 137 to analyze for drycleaning solvents such as tetrachloroethene
- Groundwater samples from wells in the vicinity of a former sewage treatment plant and Building 2 to analyze for metals
- Soil samples collected at the northern boundary of the former avgas tank farm to analyze for petroleum products

The results from this investigation were published in a technical memorandum in October 1994 (URS 1994d).

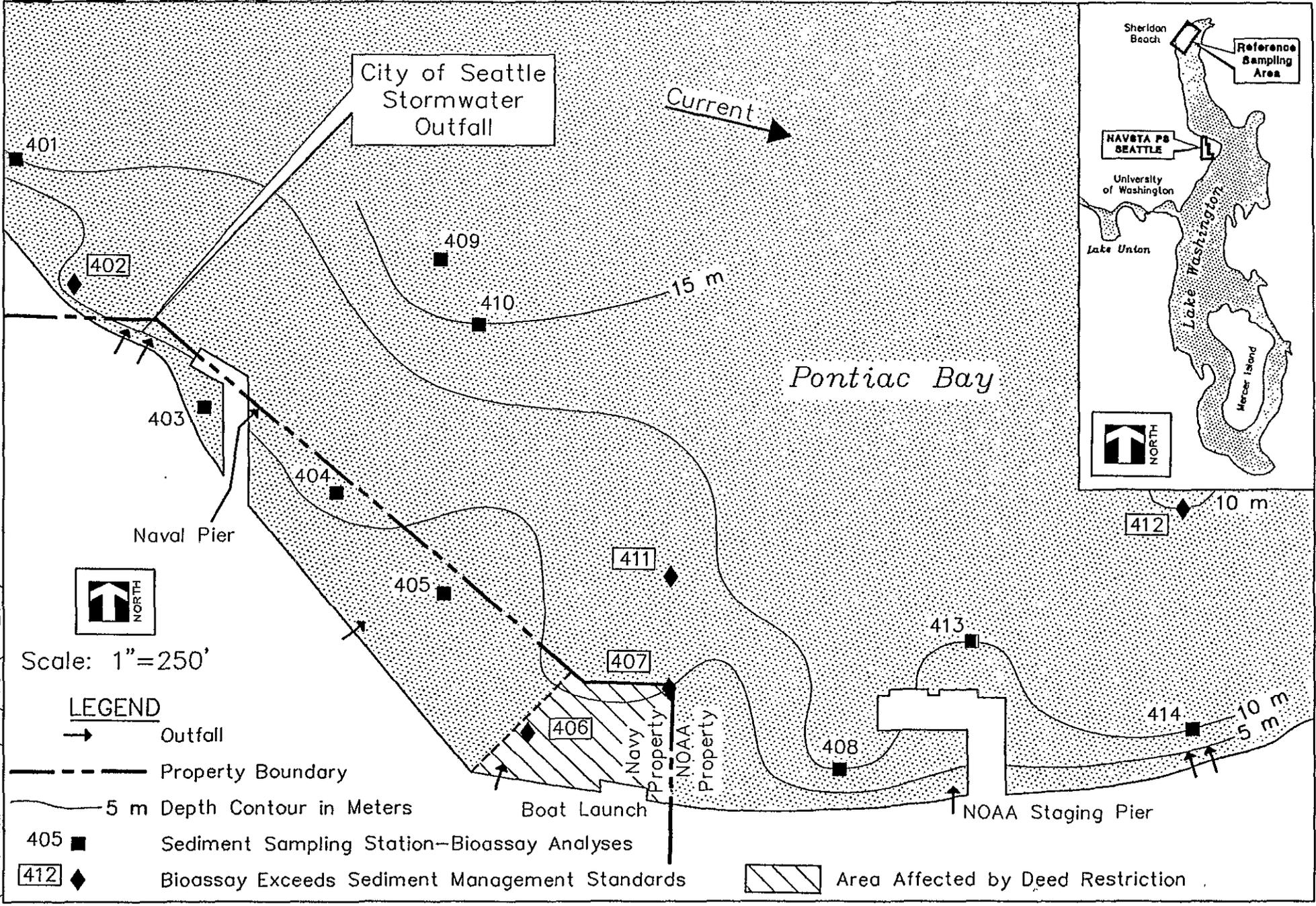
Phase I monitoring was conducted in spring 1995. The following locations were sampled:

- Groundwater at Building 2, the former avgas tank farm, and Building 137
- Soil at Building 30

Results were published in a technical memorandum in September 1995 (URS 1995e).

Bioassay tests were conducted in July 1995 in sediments collected from the shore adjacent to Sand Point and from a reference area. Results at five stations indicate that one of the two organisms tested was affected by chemicals in the sediments (see Figure 2-1). One of the stations is just north of the Sand Point boundary and near a City of Seattle stormwater outfall. Another station location is off NOAA property. The other three locations are near the northeastern boundary of Sand Point. Based on the results of these three locations, a deed restriction will be required that limits use of the shoreline to current uses. Results of the sediments study will be finalized in a report scheduled to be published in the winter of 1996.

H:\31998.04\FIG4-1.DWG 01/15/96 (1=250)



CLEAN
 COMPREHENSIVE LONG-
 TERM ENVIRONMENTAL
 ACTION NAVY

Figure 2-1
 Site Investigation and Bioassay Sampling Locations at NAVSTA PS, Seattle
 Seattle, Washington

CTO 0104
 NAVSTA PS, Seattle
 Seattle, Washington

3.0 SITE BACKGROUND

3.1 SITE HISTORY AND CURRENT USE

NAVSTA PS, Seattle, was initially named Naval Air Station (NAS) Seattle at Sand Point. The facility was built in 1925 on land donated by King County and served as a Naval Air Reserve Training facility until December 7, 1941 (U.S. Navy 1992).

During World War II, NAS Seattle supported air transport and ship outfitting personnel for the Alaskan and Western Pacific theaters of operation. Transport squadron personnel operated cargo flights to Alaska and the Aleutian Islands, supplying air stations such as Sitka, Kodiak, Dutch Harbor, Adak, and Attu. Outfitting personnel handled the preparation of escort carriers and seaplane tenders built in Tacoma and Vancouver, Washington, prior to departure for fleet duty. In 1945, the peak of its activity, the facility supported more than 4,600 Navy/Marine Corps and civilian personnel. After the war, the facility was designated a Naval Reserve Air Station. From 1945 to 1970, the station maintained Naval Reserve squadrons for supplementing active duty forces, both in the continental United States and abroad. Aviation activities officially ceased on June 30, 1970, and NAS Seattle was decommissioned.

On July 1, 1970, NAS Seattle was redesignated Naval Support Activity, Seattle. Three years after the Navy stopped its air activities, the facility was divided into three parts. NOAA received 100 acres, including one third of the runways and 3,500 feet of waterfront. The City of Seattle received the southeast portion including approximately 1 mile of waterfront that later became Magnuson Park in 1977. The Navy retained the rest. From 1970 until April 1, 1982, the base provided logistic services such as supply, billeting, and administration to the 13th Naval District, Department of Defense (DoD), and other federal agencies. In April 1982, Naval Support Activity, Seattle, was designated Naval Station, Seattle, and was later designated Naval Station Puget Sound on October 10, 1986, because of the station's increasing support role in the Pacific fleet activities. A disestablishment ceremony was held on September 28, 1995, to commemorate the closing of the base. The base was transferred to Engineering Field Activity, Northwest (EFA NW), which is responsible for caretaking until the base ultimately transfers to the City of Seattle.

There are no longer any industrial operations or aviation support activities at the facility. The base has 63 individual buildings and facility support structures with a combined total floor space of approximately 1.6 million square feet. All buildings are currently empty as a result of base closure activities. Table 3-1 lists each building and briefly describes its function.

3.2 ENVIRONMENTAL SETTING

NAVSTA PS, Seattle, is located approximately 6 miles northeast of downtown Seattle on the western shore of Lake Washington, which is the predominant natural resource near the facility. The lake provides not only opportunities for outdoor recreation for local residents, but also a variety of habitats for primarily urban animals and plants.

3.2.1 Surface Water

Lake Washington is classified as a Class A water body by the Washington Administrative Code (WAC 173-201A-120) rating system. This classification requires water quality to meet or exceed the requirements for all or substantially all of the following uses: anadromous salmon migration, rearing, spawning, and harvesting; fishing; aesthetic enjoyment and contact swimming; water supply (domestic, industrial, and agricultural); and commerce and navigation. Most of the lake's shoreline is residential property and recreational park lands.

3.2.2 Groundwater

As part of the site inspection (URS 1993b), five monitoring wells were installed along the western (upgradient) boundary of NAVSTA PS, Seattle, to assess the potential for migration of chemicals to the site from off-site sources and to establish background conditions. Analytical results from these wells indicate that soils have concentrations of arsenic and beryllium that exceed Model Toxics Control Act Method B (MTCA B) values and groundwater has concentrations of several metals (arsenic, beryllium, chromium, manganese, nickel, and vanadium) that exceed MTCA B values. Because these sampling locations are upgradient from NAVSTA PS, Seattle, operations, elevated concentrations of metals are presumed to be attributable to background conditions.

In the northernmost monitoring well, arsenic, barium, beryllium, chromium, manganese, nickel, and vanadium exceeded potential regulatory criteria for groundwater. The

**Table 3-1
 Facility Information**

| Building Number | Building Function | Square Footage | Year Built | Modification Date |
|-----------------|-----------------------------|----------------|------------|-------------------|
| 2 | Marine Corps training | 144,232 | 1929 | 1989 |
| 5 | Warehouse | 417,467 | 1929 | 1982 |
| 6 | Bowling alley | 10,793 | 1939 | |
| 9 | Enlisted barracks | 223,516 | 1929 | 1989 |
| 11 | Public Works/shops | 59,206 | 1940 | 1989 |
| 12 | Boiler plant | 5,653 | 1930 | |
| 15 | Hobby shop/arts and crafts | 3,268 | 1938 | |
| 18 | Fire station | 14,137 | 1936 | |
| 25 | Administrative | 27,892 | 1936 | |
| 26 | Officer quarters | 17,282 | 1937 | 1992 |
| 26A | Storage | 16,082 | 1937 | |
| 27 | Reserve training | 114,617 | 1937 | 1984 |
| 29 | Dispensary | 33,744 | 1937 | |
| 30 | Administrative | 80,066 | 1938 | 1989 |
| 31 | Boathouse | 3,141 | 1938 | |
| 38 | Sentry house | 58 | 1942 | |
| 40 | Paint shop | 924 | 1943 | |
| 41 | Pass and identification | 2,030 | 1939 | |
| 42 | Electrical dist. shelter | 682 | 1939 | |
| 47 | Recreation facility/gym | 50,060 | 1941 | 1989 |
| 67 | Garage | 33,720 | 1941 | |
| 69 | Detached garage | 6,776 | 1940 | |
| 98 | Sewage pump station | 93 | 1941 | |
| 115 | Public Works storage | 1,500 | 1941 | |
| 119 | Pump house | 95 | 1941 | |
| 138 | Security | 12,806 | 1942 | |
| 192 | Administrative | 4,800 | 1944 | 1989 |
| 193 | Commissary/exchange | 93,334 | 1943 | |
| 195 | Travel agency | 819 | 1984 | |
| 198 | Thrift shop | 300 | 1960 | |
| 204 | Laboratory | 9,572 | 1944 | |
| 206 | Equipment shed (demolished) | 315 | 1944 | |
| 222 | Administrative | 30,126 | 1944 | 1981 |
| 223 | Family service center | 9,080 | 1944 | 1989 |
| 224 | Bachelor enlisted quarters | 38,264 | 1944 | 1984 |
| 228 | Uniform shop | 4,074 | 1944 | |
| 244 | Maintenance shop | 5,011 | 1944 | 1975 |

Table 3-1 (Continued)
 Facility Information

| Building Number | Building Function | Square Footage | Year Built | Modification Date |
|-----------------|-------------------------|-----------------|------------|-------------------|
| 275 | Small craft boathouse | 288 | 1945 | |
| 299 | Public Works storage | 1,120 | 1949 | |
| 301 | Country store | 9,500 | 1951 | |
| 308 | Package store | 4,202 | 1951 | 1977 |
| 310 | Auto hobby shop | 4,020 | 1952 | 1989 |
| 321 | Berthing pier | 400 lineal feet | 1938 | |
| 324 | Small boat dock | 140 lineal feet | 1939 | |
| 330 | Family housing | 6,390 | 1939 | |
| 331 | Family housing | 6,233 | 1939 | |
| 332 | Family housing | 6,233 | 1939 | |
| 333 | Family housing | 1,990 | 1939 | |
| 334 | Family housing | 2,113 | 1939 | |
| 342 | Service station | 300 | 1974 | |
| 344 | Country store | 11,000 | 1974 | 1978 |
| 345 | Service bay | 5,298 | 1976 | |
| 401 | Sentry house | 60 | 1967 | |
| 402 | Boathouse | 1,760 | 1949 | |
| 403 | Standby generator plant | 164 | 1971 | |
| 404 | Recreation pavilion | 1,120 | 1979 | |
| 405 | Covered walkway | 1,120 | 1986 | |
| 406 | Brig | 29,270 | 1988 | |
| 407 | Hazardous waste storage | 548 | 1989 | |
| 408 | Motorcycle parking | 660 | 1987 | |
| 409 | Sewage pumping station | 175 | 1989 | |
| 410 | Recreation pavilion | 888 | 1990 | |
| 411 | Recreation pavilion | 888 | 1990 | |

groundwater in this well generally had the highest metal concentrations of any of the upgradient wells. These higher metal concentrations presumably result from the location of this well within the former avgas tank farm and sewage treatment facility operations. Data from this monitoring well were not used in establishing the background concentrations.

3.3 POPULATION

As of October 1, 1995, approximately 35 military reserve and civilian personnel worked at NAVSTA PS, Seattle. The U.S. Census Bureau reported the total number of individuals residing at the installation as 179 (URS 1991).

Estimates of the number of persons living within $\frac{1}{4}$ mile of NAVSTA PS, Seattle, are 730; $\frac{1}{4}$ to $\frac{1}{2}$ mile, 1,457; and $\frac{1}{2}$ to 1 mile, 1,688. These estimates were derived with the use of 1993 aerial photographs.

3.4 BIOLOGICAL RESOURCES

3.4.1 Vegetation

Two wetlands are located within the current boundaries of the base. The most prominent wetland is Lake Washington, classified as limnetic, open water, permanently flooded. The landward boundary of this wetland on the base is the water line. Another wetland exists in the drainage ditch below the Officer Quarters (Building 26); it is classified as palustrine (not lake associated) with emergent vegetation and a saturated, semipermanent, or seasonal hydrologic regime.

Native vegetation at NAVSTA PS, Seattle, is located in the southern boundary area of the facility. The vegetation is particularly prominent on the slope due east of Buildings 333 and 334 and along the entrance road to Magnuson Park. The native tree species include big leaf maple, cottonwood, red alder, western red cedar, and madrona. Brush species include hazel, elderberry, and snowberry.

A native pest weed, gorse (*Ulex europa*), grows in the northern area of the installation near the boat marina. This plant is considered noxious and is capable of rapid propagation.

Much of NAVSTA PS, Seattle, is covered with maintained lawns. Non-native tree species include Atlas cedar trees in the western areas of the facility and a Sitka white spruce tree from Alaska at the southeast corner of Building 25.

3.4.2 Wildlife

The urban character of NAVSTA PS, Seattle, and adjacent residential areas is not conducive to the formation of diverse plant and animal assemblages. The progressive urbanization and development of the western areas of Lake Washington have decreased the diversity of the plant and animal population evident in less developed areas of Washington state.

A comprehensive listing of terrestrial animal species at NAVSTA PS, Seattle, was not developed. The animals observed on the installation include feral cats and dogs, deer mice, eastern cottontail rabbits, Norway rats, and eastern gray squirrels. Other mammals that frequent the site but reside on NOAA or Magnuson Park property include striped skunks, raccoons, and coyotes. Other transient mammals known to inhabit the area include gray fox, long-tailed and least weasels, opossum, Oregon and Townsend's voles, vagrant and dusty shrews, and bat.

At least 121 migratory or resident bird species have been cataloged for the NAVSTA PS, Seattle, vicinity. Those frequently observed include the Canada goose, mallard duck, ring-billed gull, killdeer, rock dove, belted kingfisher, northern flicker, American robin and crow, European starling, and house sparrow (SCS 1992).

Freshwater fish species inhabiting Lake Washington include white sturgeon, longfin smelt, carp, goldfish, squawfish, tench, redbreast shiner, longnose dace, peamouth, brown bullhead, largemouth and smallmouth bass, black crappie, and yellow perch. Anadromous fish species include cutthroat trout, rainbow trout, chinook salmon, coho salmon, and sockeye salmon. Crayfish are abundant in the lake (SCS 1992).

3.4.3 Threatened or Endangered Species

The only documented threatened species seen in the vicinity of Lake Washington is the bald eagle, *Haliaeetus leucocephalus* (SCS 1992). The Washington State Department of Wildlife has located nests in Denny Park (on the east side of Lake Washington), and Seward Park (on the southern end of the lake), and designated them Nests 601 and 602, respectively. These eagles have been sighted perching and foraging in NAVSTA PS,

ENVIRONMENTAL BASELINE SURVEY
U.S. Navy CLEAN Contract
Engineering Field Activity, Northwest
Contract No. N62474-89-D-9295
CTO 0104

Section 3.0
Revision No.: 3
Date: 01/16/96
Page 3-7

Seattle, and in surrounding shoreline areas. The bald eagle is classified as threatened under the Federal Endangered Species Act, the Bald Eagle Protection Act, and the Migratory Bird Treaty Act.

4.0 ENVIRONMENTAL ISSUES

Various areas of environmental interest have been identified in past studies at NAVSTA PS, Seattle. This section describes the base-wide and location-specific operations that may have impacted the environment and the studies that have been conducted to assess these possible impacts.

4.1 BASE-WIDE ISSUES

Base-wide operations and conditions at NAVSTA PS, Seattle, that affected the environment include hazardous materials storage, solid and hazardous waste disposal, stormwater runoff, wastewater and sewer disposal, building materials containing asbestos, facilities containing lead-based paint, and electrical transformers containing polychlorinated biphenyls (PCBs). Manganese in soils is elevated across the base in comparison to MTCA Method B values. These concentrations of manganese are presumed to be attributable to background conditions.

4.1.1 Hazardous Materials Storage

Hazardous materials were previously stored in 40 buildings (URS 1994). All hazardous materials have since been removed from these buildings. Because of concern over possible hazardous material releases, five existing and former buildings were examined in the 1993 site inspection: Buildings 2, 67, and 310 and the sites of former Buildings 137 and 206. Section 4.2 of this report contains additional information regarding these five buildings.

4.1.2 Solid/Hazardous Waste Disposal

NAVSTA PS, Seattle, has never disposed of solid or hazardous waste in a designated on-site landfill. Solid waste disposal was conducted under contract by Waste Management of Seattle. The solid waste was collected and deposited into dumpsters. Recyclable and hazardous wastes were handled separately. Three times a week, Waste Management of Seattle picked up the dumpsters and transferred the waste into intermobile containers, which were then sent to the City-of-Seattle-contracted landfill in Gilliam County, Oregon, via rail.

Hazardous waste was collected in the two hazardous waste storage areas (Buildings 67 and 407). These buildings were designated as "short term storage facilities," which meant that they could store hazardous waste no longer than 90 days. No hazardous waste remains on base.

4.1.3 Stormwater

Surface water drainage from NAVSTA PS, Seattle, flows to Lake Washington (NEESA 1988) via either the stormwater collection system or as surface runoff. The stormwater drainage system services NAVSTA PS, Seattle; NOAA; and Magnuson Park (URS 1991). The drains were installed during the 1940s and 1950s and may have discharged assorted petroleum products and aviation distillate fuels when the installation was an active airfield. Existing discharge locations are illustrated in Figure 4-1.

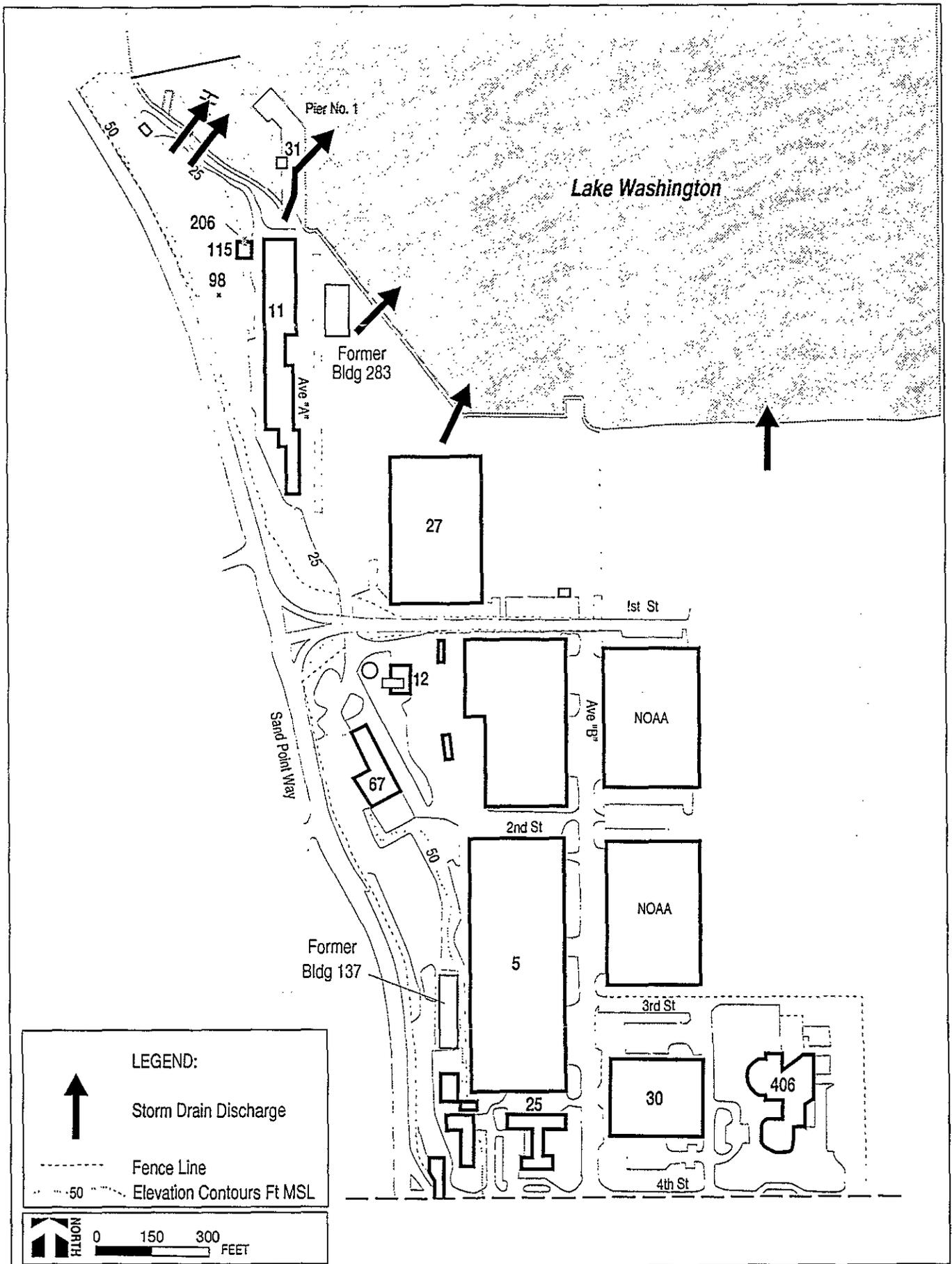
Some of the discharge collectors emptying into the main discharge drains have identifiable oil/water separators. Parts of the old aircraft landing and fueling aprons, near the hangar buildings, have stormwater collector trenches that discharge to the lake. A trench collection system remains at the site of the demolished Building 283, the Construction Equipment Maintenance Shop. This system connects to an oil/water separator that drains to Lake Washington.

Sediments near the stormwater outfalls were sampled and analyzed as the part of the 1993 site inspection. Detected concentrations of polycyclic aromatic hydrocarbons (PAHs)—a derivative of the incomplete combustion of organic material—were comparable to concentrations found elsewhere in Lake Washington (Metro 1975). Some metals and semivolatile organic compounds (SVOCs) were above detection limits.

Bioassay sampling was conducted during the summer of 1995. Samples from three sampling locations exceeded sediment management standards. However, this finding did not trigger remediation activity under current regulations since the areas represented were not contiguous.

4.1.4 Wastewater/Sewage

The wastewater/sewage services for NAVSTA PS, Seattle, are supplied by the City of Seattle. The Navy maintained five pump stations across the base to lift wastewater into the sanitary sewers (URS 1991).



Sewage services were formerly provided by the primary treatment plant located south of the former avgas tank farm and west of Building 11. In 1982, the treatment facilities and associated piping were either removed or demolished and used as fill material on the site.

4.1.5 Drinking Water

Water is supplied by the City of Seattle. Water has always been obtained from the city, and no drinking water wells were ever installed. Review of King County records reveals that no drinking water intakes from surface water sources exist within 15 miles of NAVSTA PS, Seattle (URS 1991).

4.1.6 Asbestos

An asbestos survey of 73 non-housing buildings and areas was completed in September 1993 (Alpha 1993). The survey was conducted by a contractor using state-certified asbestos inspectors. Deficiencies identified correlate with the Navy's Risk Assessment Program (OPNAVINST 5100.23C, Chapter 12, "Deficiency Abatement Program") and the Federal System Safety Standard (MIL-STD-882B, "System Safety Program Requirements"). The survey assigned a relative risk assessment code (RAC) for asbestos deficiencies by building. Five risk assessment codes were used for the survey:

- RAC 1 = critical
- RAC 2 = serious
- RAC 3 = moderate
- RAC 4 = minor
- RAC 5 = negligible

A total of 928 compliance deficiencies were reported in the survey. Table 4-1 lists buildings included in the survey and identifies the number of deficiencies by risk assessment code. No critical deficiencies were noted. Sixty-three serious compliance deficiencies were found in 12 buildings (Buildings 2, 5, 6, 9, 11, 15, 18, 25, 27, 40, 192, and 193). Deficiencies pertained to discrete areas within each structure and did not necessarily reflect the condition of the entire building. As a result of the survey, asbestos in all 12 buildings has been abated.

Table 4-1
 Asbestos Risk Assessment Summary

| Building No. | Date Built | Name | Number of Deficiencies by Risk Assessment Code (RAC) ^a | | | | | Total Number of Deficiencies |
|--------------|------------|----------------------------------|---|----|----|----|---|------------------------------|
| | | | 1 | 2 | 3 | 4 | 5 | |
| 2/119 | 1929 | Reserves hangar | — | 14 | 5 | 26 | — | 45 |
| 5 | 1929 | Supply warehouse | — | 15 | 12 | 52 | — | 79 |
| 6 | 1939 | Bowling alley | — | 2 | 3 | 16 | — | 21 |
| 9 | 1929 | UEPH/Administration | — | 15 | 53 | 88 | — | 156 |
| 11 | 1940 | Public Works | — | 1 | 16 | 47 | — | 64 |
| 12 | 1930 | Boiler plant | — | — | 5 | 14 | — | 19 |
| 15 | 1938 | Ceramics shop | — | 1 | 2 | 7 | — | 10 |
| 18 | 1936 | Fire station | — | 2 | 1 | 18 | — | 21 |
| 25 | 1936 | Administration | — | 6 | 4 | 27 | — | 37 |
| 26 | 1937 | UOPH A&B | — | — | 6 | 17 | — | 23 |
| 27 | 1937 | Reserves hangar | — | 2 | 5 | 31 | — | 38 |
| 29 | 1937 | Dispensary | — | — | 2 | 17 | — | 19 |
| 30 | 1938 | Administration | — | — | 10 | 32 | — | 42 |
| 31 | 1938 | Boathouse | — | — | 2 | 15 | — | 17 |
| 38/138 | 1942 | Guard station | — | — | — | — | — | 0 |
| 40 | 1943 | Flammable stores | — | 2 | 2 | 4 | — | 8 |
| 41 | 1939 | Security | — | — | 1 | 5 | — | 6 |
| 42 | | Main power subs | — | — | — | 1 | — | 1 |
| 47 | 1941 | Recreation facility | — | — | 14 | 34 | — | 48 |
| 60 | | Flammable stores ^b | Demolished | | | | | 0 |
| 61 | | Storage ^b | — | — | — | 1 | — | 1 |
| 67 | 1941 | Trans/garage | — | — | 6 | 15 | — | 21 |
| 69 | | UOPH parking | — | — | — | — | — | 0 |
| 98 | 1940s | Sewage pump station | — | — | — | 1 | — | 1 |
| 109 | | Water meter pit ^c | — | — | — | — | — | 0 |
| 115 | 1941 | Public Works storage | — | — | 2 | 6 | — | 8 |
| 116 | | Sewage pump station ^c | — | — | — | 3 | — | 3 |
| 118 | | Sewage lift station ^c | — | — | — | — | — | 0 |
| 119 | | Stormwater pump station | — | — | 1 | 1 | — | 2 |
| 138 | | Gate house | — | — | 2 | 16 | — | 18 |
| 141/192 | 1970s | Homeport administration | — | 2 | 3 | 18 | — | 23 |
| 193 | 1940s | Navy Exchange commissary | — | 1 | 7 | 30 | — | 38 |
| 195 | | Navy Exchange ticket office | — | — | — | 4 | — | 4 |
| 198 | | Thrift shop | — | — | — | 5 | — | 5 |
| 204 | | Fish and Wildlife lab | — | — | 3 | 17 | — | 20 |
| 206 | 1944 | Equipment shed | Demolished | | | | | 0 |

Table 4-1 (Continued)
 Asbestos Risk Assessment Summary

| Building No. | Date Built | Name | Number of Deficiencies by Risk Assessment Code (RAC) | | | | | Total Number of Deficiencies |
|--------------|------------|--|--|---|----|----|---|------------------------------|
| | | | 1 | 2 | 3 | 4 | 5 | |
| 219 | | Hot well ^c | — | — | — | — | — | 0 |
| 222 | 1944 | Supply ships administration | — | — | 14 | 18 | — | 32 |
| 223 | 1944 | Family service center | — | — | — | 6 | — | 6 |
| 224 | 1944 | UOPH/UEPH | — | — | 6 | 24 | — | 30 |
| 228 | Unknown | Navy Exchange tailor shop | — | — | 3 | 8 | — | 11 |
| 244 | Unknown | Navy Exchange storage/maintenance | — | — | — | 3 | — | 3 |
| 275 | 1945 | Boat shelter | — | — | — | 2 | — | 2 |
| 281 | | Water meter pit ^c | — | — | — | 1 | — | 1 |
| 282 | | Sewage lift station ^c | — | — | — | — | — | 0 |
| 299 | 1949 | Public Works storage | — | — | 2 | 4 | — | 6 |
| 301/344 | Unknown | Navy Exchange country store | — | — | 1 | 4 | — | 5 |
| 307 | | Fish and Wildlife stores | Demolished | | | | | 0 |
| 308 | | Navy Exchange Class VI store | — | — | — | 4 | — | 4 |
| 310 | Unknown | Auto hobby shop | — | — | — | 3 | — | 3 |
| 321 | | Pier 1 | — | — | — | 2 | — | 2 |
| 324 | | Pier 7 | — | — | — | — | — | 0 |
| 337 | | Pedestrian bridge ^c | — | — | — | — | — | 0 |
| 340 | | Navy Exchange gas island ^c | — | — | — | — | — | 0 |
| 341 | | Navy Exchange courtesy island ^c | — | — | — | — | — | 0 |
| 342 | | Navy Exchange gas cashier | — | — | — | 3 | — | 3 |
| 344 | | Navy Exchange country store | — | — | — | 3 | — | 3 |
| 345 | Unknown | Navy Exchange auto service | — | — | — | 3 | — | 3 |
| 389 | | Mooring dolphin ^c | — | — | — | — | — | 0 |
| 391 | | Truck scale ^c | — | — | — | — | — | 0 |
| 401 | | Guard station | — | — | — | — | — | 0 |
| 402 | 1949 | Boathouse | — | — | — | — | — | 0 |
| 403 | | Standby generator | — | — | — | 2 | — | 2 |
| 404 | | Picnic shelter | — | — | — | — | — | 0 |
| 405 | | Navy Exchange covered walkway | — | — | — | — | — | 0 |
| 406 | 1986 | Brig | Not included in asbestos survey | | | | | |
| 407 | 1989 | Hazardous waste storage | — | — | — | — | — | 0 |
| 408 | | Motorcycle parking | — | — | — | — | — | 0 |
| 409 | | Sewage pump station | — | — | — | — | — | 0 |
| 410 | | Picnic shelter | — | — | — | — | — | 0 |

Table 4-1 (Continued)
Asbestos Risk Assessment Summary

| Building No. | Date Built | Name | Number of Deficiencies by Risk Assessment Code (RAC) ^a | | | | | Total Number of Deficiencies |
|--------------|------------|-----------------------------------|---|----|-----|-----|---|------------------------------|
| | | | 1 | 2 | 3 | 4 | 5 | |
| 411 | | Picnic shelter | — | — | — | — | — | 0 |
| — | | FECU ^b | — | — | — | — | — | 3 |
| — | | Steam pits and lines ^c | — | — | 6 | 5 | — | 11 |
| TOTAL | | | 0 | 63 | 199 | 666 | 0 | 928 |

^aThe RAC is derived from MIL-STD-882B (System Safety Program Requirements) and OPNAVIST 5100.23C, Chapter 12 (Deficiency Abatement Program). Probability of hazard and severity of hazard are combined to produce a relative RAC. The RAC is used Navy-wide as a management tool to prioritize corrective action at multiple sites.

^bAlthough included in the asbestos risk assessment summary, these buildings are not considered part of NAVSTA PS, Seattle.

^cThese were not considered facilities for the purpose of Table 3-1.

UEPH - Unmarried enlisted public housing

UOPH - Unmarried officers' public housing

FECU - Federal Employees Credit Union

4.1.7 Lead-Based Paint

A survey of lead-based paint was completed. The survey investigated the interiors of 17 buildings that could be used as residences or child care facilities (Buildings 2, 5, 9, 25, 26, 29, 30, 47, 192, 222, 223, 224, 330 to 334, and 406). Lead-based paint was found in all buildings except the brig (Building 406). Peeling lead-based paint was scraped and surfaces repainted in three homes expected to house children (Buildings 330, 331, 332).

4.1.8 PCBs

Locations of 33 former PCB-containing transformers are shown in Figure 4-2. The transformers were located either in concrete vaults or in fenced areas on concrete pads. Public Works personnel stated that there may have been spills or fires at some of the transformer locations (URS 1991). Fire department records have been archived in Washington, D.C., and are unavailable for confirmation.

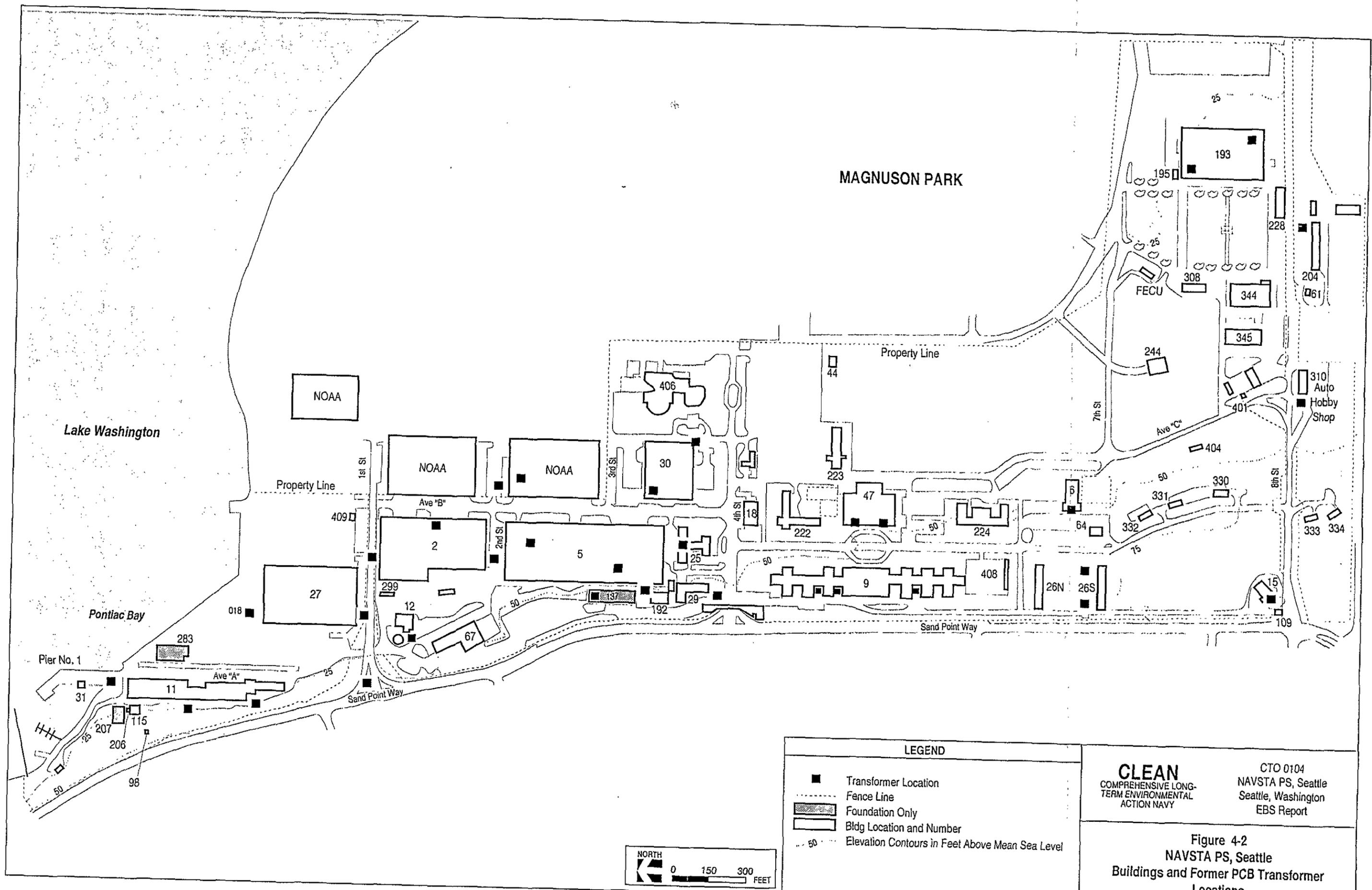
NAVSTA PS, Seattle, phased out the use of PCB-containing transformers beginning in 1984. The transformers and associated PCB-containing fluids were shipped and disposed of in accordance with EPA regulations. Review of Public Works documents shows that the last shipment of PCB transformers occurred in 1988 (URS 1991). The facility no longer has PCB-containing transformers (URS 1991).

The former transformer pads were sampled for PCBs (URS 1993a). Sampling location 42 at Building 6, reported concentrations of Aroclor 1260—one of the many PCB forms—above EPA cleanup levels. In July 1993, the surface of the pad was cleaned and resampled in accordance with EPA guidelines. No PCBs were detected, indicating the cleanup was complete (URS 1993b).

In addition, PCBs were detected in two roof samples (URS 1994e).

4.2 AREA-SPECIFIC ISSUES

NAVSTA PS, Seattle, comprises 63 buildings and structures (Table 3-1). Building uses formerly included administrative; transportation; maintenance; bachelor, enlisted, and officers' quarters; recreational; commissary; exchange; service station; public works; and warehousing. The function of these buildings, such as the hangars (Buildings 2, 27, and



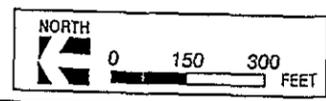
LEGEND

- Transformer Location
- - - Fence Line
- ▨ Foundation Only
- ▭ Bldg Location and Number
- ... 50 ... Elevation Contours in Feet Above Mean Sea Level

CLEAN
 COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY

CTO 0104
 NAVSTA PS, Seattle
 Seattle, Washington
 EBS Report

Figure 4-2
 NAVSTA PS, Seattle
 Buildings and Former PCB Transformer Locations



193), changed over time according to both the military and administrative activities of the U.S. Navy (URS 1991).

The following sections briefly describe the significant operations and existing conditions at specific buildings and areas at NAVSTA PS, Seattle, that were addressed in past environmental investigations.

4.2.1 Former Laundry (Building 137)

Building 137, formerly located west of Building 5 near Sand Point Way, was used as a drycleaning facility from the 1940s until its demolition in 1983. After demolition, the building foundation was renovated for use as a parking lot. Drain pipes and floor tiles are still evident in portions of the lot. The former drycleaning building was approximately 137 feet long and 64 feet wide.

Stoddard solvent was used for drycleaning at Building 137. Other organic chemicals or solvents may have been used prior to the 1960s. Petroleum hydrocarbons used as drycleaning agents exceeded MTCA A cleanup levels in soils at one isolated location at the southeast corner of the building. An underground storage tank for drycleaning solvents was formerly at this location (URS 1994e). Groundwater in the vicinity of the former facility was sampled. However, no petroleum hydrocarbons were found to exceed MTCA cleanup levels (URS 1995e).

Monitoring wells were installed during the 1993 site inspection to determine if chemicals were released from the former laundry facility to soils or groundwater. These wells are artesian, a condition that occurs in various locations throughout NAVSTA PS, Seattle. An artesian head on the aquifer prevents released materials from passing through impermeable soil layers above and below the aquifer. No volatile organic compounds (VOCs) or semivolatile organic compounds (SVOCs), which are constituents of drycleaning chemicals, were detected in either the soils or groundwater (URS 1993a). In addition, no diesel-range compounds were detected in the monitoring well near Building 137.

4.2.2 Marine Corps Reserve Center (Building 2)

Building 2, located west of the NOAA facilities, housed the Marine Corps Reserve motorpool and offices. The building, constructed in 1938, was an active air hangar until the Naval Air Station was decommissioned in 1970. Airplane maintenance and storage

activities at Building 2 (also called Hangar 2) may have involved the use of avgas, lubrication oils, fabric doping fluids, stripping agents, paints, thinners, and organic solvents. Hard-metal plating operations were conducted in Building 2 in the 1940s. Metals exceed MTCA B cleanup levels in soils beneath the floor of a former plating shop (URS 1994e). Groundwater in the vicinity of Building 2 was sampled. Arsenic and manganese exceeded MTCA Method B levels but are comparable to background levels (URS 1995e).

During the 1930s and 1940s, aircraft were constructed of chemically hardened fabric draped over wooden and steel frames. The production process was referred to as "doping." Patching and refurbishing used the same doping process. Many of these chemicals were used and stored at NAVSTA PS, Seattle. Building 119, next to Building 2, was the primary repository for doping materials. More recently, the building was used by power plant personnel for equipment storage.

Monitoring wells were installed as part of the 1993 site inspection in the vicinity of Building 2 to determine whether chemicals used in the hangar were released to the soils or groundwater. No VOCs or SVOCs were detected in either groundwater or soils (URS 1993a). Soil samples were collected from beneath the concrete where acid tanks were located. Metals were detected above MTCA B concentrations in the soils beneath the concrete floor. However, there are no risk exposure pathways. Arsenic and manganese in groundwater exceeded MTCA B cleanup levels in samples collected during the Phase I monitoring conducted in spring 1995 (URS 1995e). Phase II monitoring will be conducted in January 1996.

4.2.3 Pesticide Residue Tank (Building 206)

Pesticides for grounds and building pest control were stored and prepared in Building 206, which was located on the north end of Building 115 and west of Building 11 (Building 206 was demolished in the fall of 1993). Pesticide dispensing equipment and residual products from canisters were cleaned and drained to an underground sump tank located in the foundation of the building. The tank was decommissioned in the mid-1970s. While in use, the tank received numerous formulations of pesticides, insecticides, herbicides, and rodenticides. The tank's integrity prior to closure is uncertain and pesticides may have been released.

Monitoring wells in the vicinity of Building 206 were sampled in the fall of 1992 and again in July 1993 (URS 1993b). No VOCs, SVOCs, PCBs, pesticides, or chlorinated

herbicides were detected above MTCA B criteria in groundwater samples taken near the former Building 206 site. Nineteen metals were detected. The metals found in the groundwater samples were identical to those found in the upgradient wells, but the concentrations were greater. The concentration of arsenic exceeded EPA and MTCA B criteria.

Six boreholes were sampled in the vicinity of the pesticide residue tank. No VOCs, SVOCs, PCBs, or chlorinated herbicides were detected. However, pesticides were detected in the subsurface soils (2.5 to 5.5 feet bgs) at concentrations exceeding MTCA B values. In order to remediate this area, the Navy has completed removal of the pesticide tank and the surrounding soils.

4.2.4 Public Works Transportation Building (Building 67)

Building 67 was used since the late 1930s as a vehicle maintenance and storage garage for NAVSTA PS, Seattle. This building, located west of Building 2, had both exterior and interior vehicle maintenance stalls. Some of the stalls had oil/water sumps and hydraulic lift stations for associated hydraulic fluid tasks. The materials used at Building 67 for vehicle maintenance and repair may have included lubrication oils, petroleum distillates, thinners, lacquers, paints, gasoline, diesel fuel, and engine oil.

During the SI (URS 1993a), two monitoring wells were installed in the vicinity of Building 67 to determine whether chemicals used in the building were released to the soils or groundwater. One of the monitoring wells is under artesian conditions. No VOCs or SVOCs were detected in groundwater or soils at Building 67. The compound n-nitrosodipropylamine was detected in one well at the laboratory detection limit. Although the concentration exceeded MTCA B levels, the analytical results may be a false positive because this chemical was detected at a low concentration, it was not found in any other sample on site, and there is no known on-site source for this chemical.

4.2.5 Auto Hobby Shop (Building 310)

The Auto Hobby Shop, located in the far southern portion of the site, housed a sump in the steam cleaning area. The sump, on the east of the building, reportedly received various lubrication oils, petroleum distillates, thinners, lacquers, paints, and fuel products.

During the site inspection (URS 1993b), boreholes were sampled in the vicinity of the Auto Hobby Shop to determine whether petroleum products were released to the soils

from either the wastewater sump or a former UST (Tank No. 310A). Diesel levels in one borehole exceeded MTCA A cleanup levels. Motor oil concentrations in two boreholes exceeded MTCA A cleanup levels. As a result of these elevated levels, the Navy removed the sump and surrounding soils during an expedited cleanup action in February 1994. Adjacent University of Washington property was sampled and no contamination was found.

4.3 TANK AND PIPING ISSUES

The following sections discuss past operations and recent environmental studies of the fuel tanks and piping system (for aviation gasoline [avgas] and motor vehicle gasoline [mogas]), underground storage tanks, and the 100,000-gallon tank at Building 12.

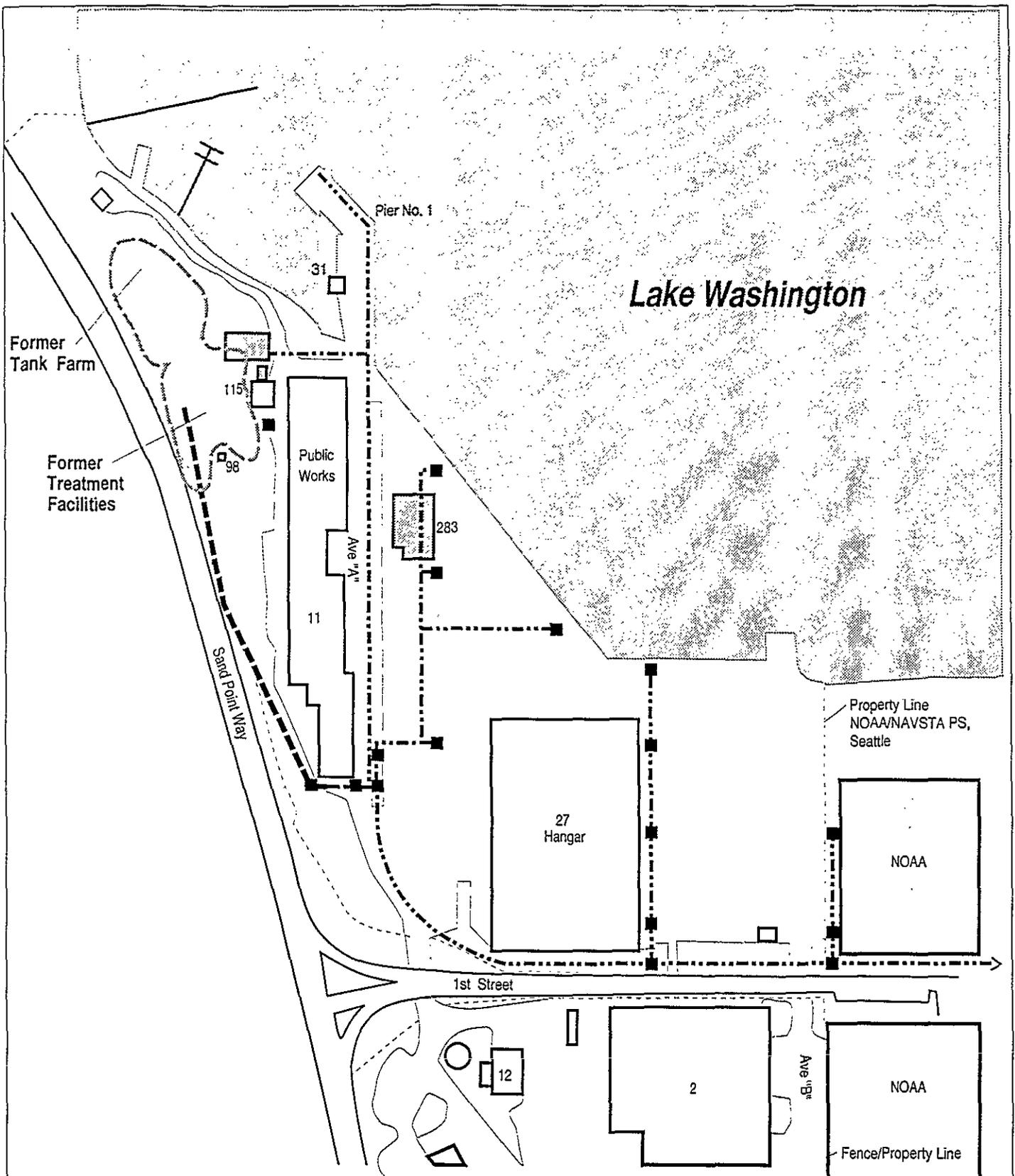
4.3.1 Avgas Storage and Piping

The avgas storage and piping system consisted of 15 USTs and associated pumps, valves, pipes, and airplane fueling stations. The system, which was constructed in the 1930s and 1940s, was deactivated in 1970 when the U.S. Navy decommissioned NAS Seattle.

As shown in Figure 4-3, the area west of Building 11 and approximately 25 feet north of Building 98 was the location of the 15 avgas USTs (the fuel tank farm). The tanks were removed in 1980, but associated piping was left in place. Engineering drawings indicated that the tanks were constructed with a water drain field system. This system used water to lift the fuel to the top of the USTs for pumping. The drain field system discharged water through an 8-inch pipe to Lake Washington. The system was reportedly removed at the same time as the primary sewage treatment facilities, but the 8-inch discharge pipe is still visible at the shoreline. Regulations of the Washington State Shoreline Management Act (WAC 173-14) govern removal of the pipe.

The avgas pipelines were used to transport avgas from the tank farm to the air field and maintenance buildings for refueling aircraft. The overall length of the pipeline is approximately 7,275 feet, of which 5,340 feet are on naval property. The size of the piping varies from 1 to 8 inches in diameter and the piping is entirely underground. The pipeline was abandoned by the early 1960s and was cleaned by the Navy in 1995.

During the SI addendum (URS 1993c), a 1948 map was used to locate the avgas lines. Because many of the buildings on the map have been demolished and new buildings



Lake Washington

Former Tank Farm

Former Treatment Facilities

Pier No. 1

31

115

98

Public Works

Ave 'A'

283

11

Sand Point Way

27 Hangar

Property Line
NOAA/NAVSTA PS,
Seattle

NOAA

1st Street

12

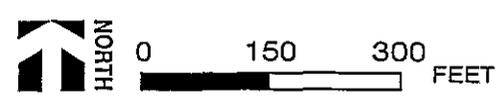
2

Ave 'B'

NOAA

Fence/Property Line

- LEGEND:**
- - - - - Avgas Line (under pavement)
 - — — — — Avgas Line (under grass)
 - Manhole
 - - - - - Fence Line
 - ▒ Foundation Only



CLEAN
Comprehensive Long-Term Environmental Action Navy

Figure 4-3
Avgas Line Locations

CTO 0104
NAVSTA PS, Seattle
Seattle, Washington
EBS REPORT

constructed, location of the avgas line was projected to a current base map. As-built maps were also used to plot the avgas pipeline location.

With the use of maps and as-built drawings, the actual location of the avgas pipeline was field verified. As shown on the maps, manholes that contained filling hoses and control valves were field located. All but a few have been filled with gravel and topped with concrete. Most of the avgas line is under 6 to 18 inches of reinforced concrete.

Additionally, the location of the avgas pipeline was field verified beneath Pier No. 1 and north of Building 11 (see Figure 4-3). Base maps indicate that other utilities (stormwater main and sanitary sewer main lines) are located in the vicinity of the avgas line. Where the line crosses to the grassy area between Building 11 and Sand Point Way, contact with the line was lost. It was believed that from this point on, piping had been removed. The grassy area was swept with a utility locator to confirm that the piping had indeed been removed.

As part of the SI addendum, soil samples were collected at discrete locations along the avgas pipeline and analyzed for total petroleum hydrocarbons (TPH) and lead. Results of field screening indicate that TPH is present along most of the avgas lines west of Building 27. Because of the cohesiveness and apparent low permeability of the soils surrounding the avgas lines, the soils have acted to retard migration of fuel off site. However, the horizontal extent of petroleum hydrocarbon-impacted soils has not been determined. The vertical migration of petroleum hydrocarbons has been restricted by the very dense, low-permeability till underlying the site.

Elevated concentrations of TPH were detected at the former tank farm (URS 1994b). Based on these results, 3,800 cy of contaminated soil was excavated from the tank farm area and properly disposed.

4.3.2 Mogas Storage

Mogas was stored in two USTs located near Building 98, the former Gasoline Pump House. During February 1991, a site inspection was conducted in the immediate area around Building 98 (Hart Crowser 1991). In one soil boring advanced in the area, TPH was detected at a concentration of 2,800 mg/kg at approximately 8.5 feet below ground surface (bgs); groundwater was detected at 10.5 feet bgs. Those soils exceeding MTCA Method A were excavated and properly disposed.

4.3.3 Underground Storage Tanks

All USTs at NAVSTA PS, Seattle, have been removed or closed in place (URS 1993c). Information concerning USTs is listed in Table 4-2 and their locations are shown in Figure 4-4.

Table 4-2
 Summary of USTs at NAVSTA PS, Seattle

| Tank No. | Size (gallons) | Product | Comments |
|----------|----------------|-------------------|---|
| 2 | 200 (est.) | Gasoline | Removed in September 1994 |
| 12A | 8,800 | Fuel Oil | Removed in 1990 (buried railroad car) |
| 12B | 8,800 | Fuel Oil | Removed in 1990 (buried railroad car) |
| 12C | 100,000 | Fuel Oil | Closed in place in January 1995 |
| 12D | 2,000 | Gasoline | Closed in place in January 1995 |
| 29 | 300 | Diesel | Removed in January 1994 |
| 143 | 3,000 | Diesel | Removed in November 1988 |
| 144 | 2,500 | Unleaded Gasoline | Removed in November 1988 |
| 145 | 2,500 | Unleaded Gasoline | Removed in November 1988 |
| 206 | 1,000 | Pesticides | Tank has not been used since 1980 and was closed in place; removed in February 1994 |
| 310A | 500 | Waste Oil | Removed in 1990 |
| 340A | 15,000 | Leaded Gas | Removed in September 1992 |
| 340B | 15,000 | Unleaded Gas | Removed in September 1992 |
| 340C | 15,000 | Unleaded Gas | Removed in September 1992 |
| 345 | 500 | Waste Oil | Removed in January 1994 |
| 403 | 300 | Diesel | Removed in February 1994 |
| 406 | 550 | Diesel | Removed in August 1994 |

According to Navy files, four tanks (Tank Nos. 166, 167, 168, and 169) located at the old Navy Exchange Gas Station, Building 41, were removed in December 1986. At the time, regulations requiring site assessment and remediation following tank removal did not exist. Therefore, it is possible that petroleum from spills or leaks remains at the site.

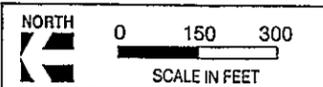
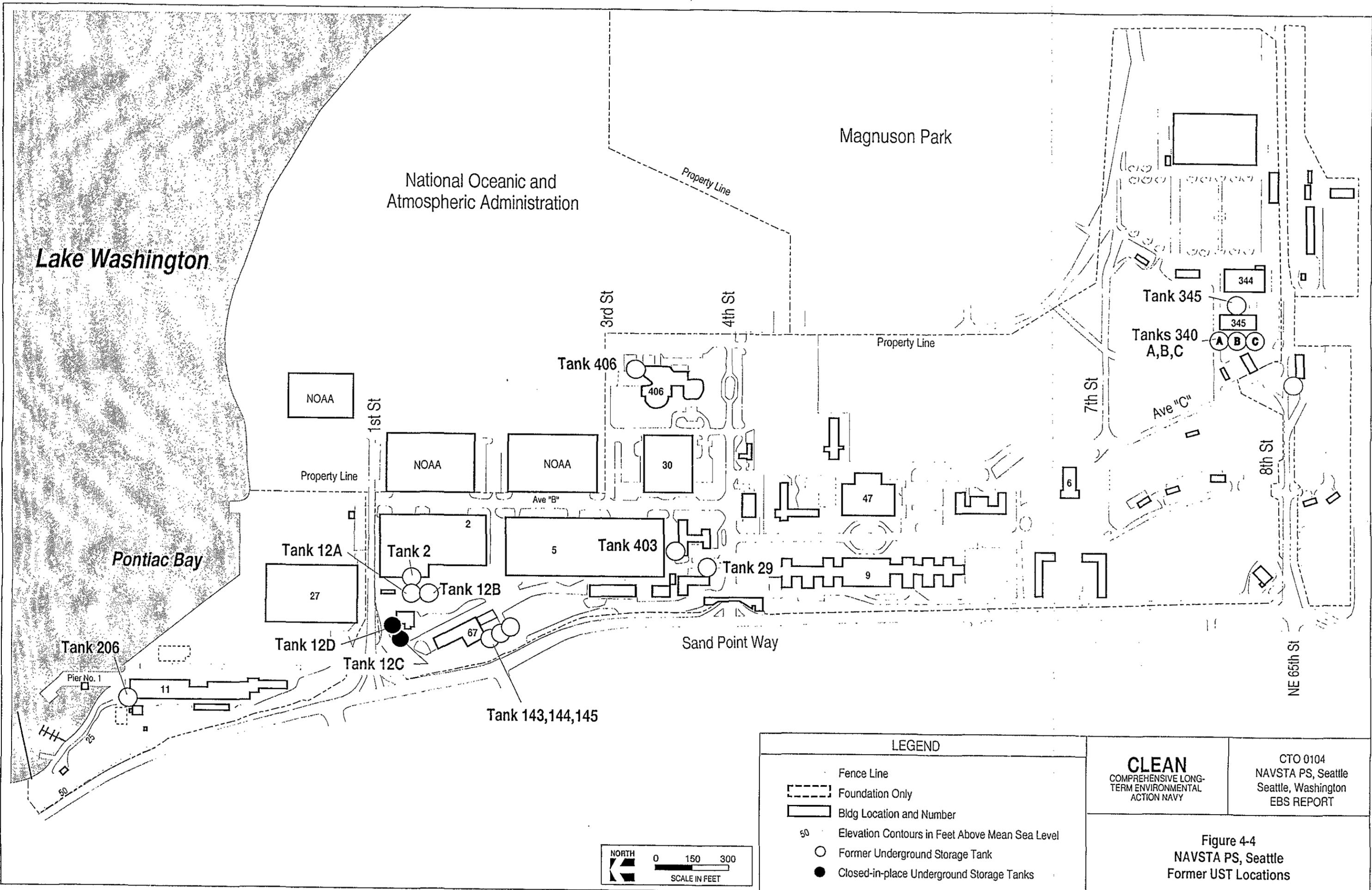
During the SI addendum (URS 1993c), a monitoring well was installed in the area between the former tanks and Lake Washington. However, no petroleum products were detected.

Three tanks (Tank Nos. 143, 144, and 145) located south of Building 67 were removed in November 1988. Three soil samples were collected and analyzed with results from two of the samples at TPH concentrations of 730 ppm and 4,200 ppm. Navy records do not clearly indicate whether or not overexcavation was conducted.

4.3.4 100,000-Gallon UST (Tank 12C)

The 100,000-gallon UST was closed in place in January 1995. Oil-fired steam boilers located at Building 12, the Power Plant, historically supplied heat for NAVSTA PS, Seattle, buildings. The 100,000-gallon fuel tank supplying the boilers was refueled by railroad tanker cars and by barge/ship at Pier No. 1. A pipeline (now abandoned) connected the pier to the 100,000-gallon UST. The boiler plant has since been converted to use natural gas. However, during the winter when demand for natural gas was high, gas service to the boilers was cut off and fuel from the 100,000-gallon UST was used as a backup fuel supply. Following closure of the UST, four mobile aboveground tanks were installed to store backup fuel for the boiler.

As part of the SI addendum (URS 1993c), soils in the vicinity of the 100,000-gallon UST were sampled. Analytical results indicate that soils around the UST were not impacted by petroleum hydrocarbons. Prior to closing the tank, it was emptied of fuel and a hole was drilled through the bottom of the tank so that underlying soil and water could be sampled. No petroleum hydrocarbons were detected in either the soil or groundwater under the tank.



| LEGEND | |
|--------|---|
| | Fence Line |
| | Foundation Only |
| | Bldg Location and Number |
| | Elevation Contours in Feet Above Mean Sea Level |
| | Former Underground Storage Tank |
| | Closed-in-place Underground Storage Tanks |

| | |
|---|---|
| CLEAN COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY | CTO 0104 NAVSTA PS, Seattle Seattle, Washington EBS REPORT |
| | Figure 4-4 NAVSTA PS, Seattle Former UST Locations |

5.0 FINDINGS APPLICABLE TO REGULATORY COMPLIANCE ISSUES

Federal and state regulations potentially applicable to the EBS findings are discussed in the following sections.

5.1 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

NAVSTA PS, Seattle, was registered as a hazardous waste generator and its generator number has been transferred to EFA Northwest. The installation had two buildings (Buildings 67 and 407) that were permitted to store hazardous wastes for up to 90 days for eventual transport. However, the installation did not treat or dispose of hazardous waste on site. A third facility has since been constructed to store hazardous waste.

5.2 TOXIC SUBSTANCES CONTROL ACT (TSCA)

With the removal of the PCB transformers, it is believed that NAVSTA PS, Seattle, no longer has PCB articles regulated under TSCA (40 CFR 760 and 761). However, disposal of asbestos-containing materials would be governed by TSCA regulations.

5.3 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA)

EPA has determined that environmental conditions at NAVSTA PS, Seattle, do not warrant listing the site on the National Priorities List (NPL), also known as the Superfund list. No further action is required at NAVSTA PS, Seattle, under CERCLA.

5.4 CLEAN AIR ACT

The boiler at Building 12 is a registered source of air particulates. The cyclone separator in the wood shop (Building 11) and the 100,000-gallon UST are also registered emission sources. These sources are registered with the Puget Sound Air Quality

Authority. The Navy has recently notified the Authority that the 100,000-gallon tank has been permanently closed.

5.5 COASTAL ZONE MANAGEMENT (CZM)

NAVSTA PS, Seattle, does not have a CZM permit nor has it had one in the past.

5.6 STORMWATER NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

NAVSTA PS, Seattle, does not have an NPDES permit for its stormwater drainage.

5.7 WETLANDS

Two wetlands, including portions of Lake Washington, are located within the boundaries of the base.

6.0 SUMMARY AND PENDING ACTIONS

Environmental conditions were assessed at NAVSTA PS, Seattle, during two preliminary assessments, three site inspections, and a site inspection addendum. The environmental studies investigated former and present hazardous materials storage areas; solid and hazardous waste disposal practices; facilities containing asbestos, lead-based paint, and PCBs; underground storage tanks and piping; and specific facilities where past practices may have affected the environment. As a result of these investigations, sampling was conducted in the fall of 1992 and during July and October 1993. Followup sampling of surface soils, subsurface soils, sediments, and groundwater was conducted in 1994 and 1995, and sediments were sampled in Lake Washington. The following sections summarize information obtained from these investigations.

Based on the site inspection, EPA has determined that environmental conditions at NAVSTA PS, Seattle, do not warrant listing the site on the NPL, also known as the Superfund list. No further action is required at NAVSTA PS, Seattle, under CERCLA.

6.1 BASE-WIDE OPERATIONS

6.1.1 Hazardous Materials Storage

All hazardous materials that were stored at NAVSTA PS, Seattle, have been removed.

6.1.2 Solid/Hazardous Waste Disposal

No designated landfills for either solid or hazardous wastes were known to operate at NAVSTA PS, Seattle. Solid waste was shipped off site through a licensed contractor and disposed in a permitted landfill. Hazardous waste was held in short-term facilities (Buildings 67 and 407). A new short-term facility is under construction. Disposal of hazardous waste was coordinated through Defense Reutilization and Marketing Organization (DRMO) in accordance with EPA regulations.

6.1.3 Stormwater

Surface water is collected in a stormwater collection system that includes oil/water separators. The Navy has performed periodic maintenance of the oil/water separators. The stormwater is discharged into Lake Washington at seven locations. Sediments near the stormwater discharges were sampled as part of the site inspection. Concentrations of PAHs were found to be comparable to those at other locations in Lake Washington.

6.1.4 Wastewater/Sewage

In the past, sewage services were provided on site. Sanitary sewer service is currently supplied by the City of Seattle.

6.1.5 Drinking Water

Drinking water has always been supplied by the City of Seattle. King County records show no drinking water intakes within 15 miles of NAVSTA PS, Seattle.

6.1.6 Lake Washington Sediments

Sediments at a limited portion of the shoreline have been impacted by runoff from Sand Point. A deed restriction will limit use of sediments at the eastern boundary to current uses.

6.1.7 Asbestos

An asbestos survey of 73 non-housing buildings and areas was completed in September 1993. A total of 928 compliance deficiencies were reported in the survey. Deficiencies were evaluated on a scale from 1 (critical) to 5 (negligible). No "critical" compliance deficiencies were noted. However, 63 serious deficiencies were found in 12 buildings, which were then abated by the Navy.

6.1.8 Lead-Based Paint

A survey of buildings containing lead-based paint was conducted in 1993. All buildings surveyed contained lead-based paint except the brig. Peeling and chipping paint in three homes was removed and the surfaces repainted.

6.1.9 PCBs

Thirty-three transformer pads were sampled for PCB residues. One of the pads had concentrations of PCBs exceeding cleanup levels. As a result, the pad was cleaned and resampled with no PCBs detected. Analytical results indicated that no further cleanup was necessary. PCBs were detected in two roof samples.

6.2 AREA-SPECIFIC ISSUES

Environmental cleanup actions at Sand Point are complete and all area-specific issues have been resolved to the satisfaction of the BRAC Cleanup Team. In accordance with CERFA guidelines, NAVSTA PS, Seattle, buildings and areas have been categorized in one of seven environmental risk classifications based upon historical use and the possible presence of hazardous materials or wastes. Figure 6-1 describes each classification and shows the NAVSTA PS, Seattle, buildings and area locations that are associated with each category.

6.2.1 Former Laundry (Building 137)

Petroleum hydrocarbons used as drycleaning agents exceeded MTCA A cleanup levels in soils at one isolated location at the southeast corner of the building. An underground storage tank for drycleaning solvents was formerly at this location (URS 1994e). Groundwater was sampled; however, no petroleum hydrocarbons exceeded MTCA cleanup levels (URS 1995e).

6.2.2 Marine Corps Reserve Center (Building 2)

Metals exceed MTCA B cleanup levels in soils beneath the floor of a former plating shop (URS 1994e). Groundwater in the vicinity of Building 2 was sampled. Arsenic and manganese exceeded MTCA Method B levels but are comparable to background levels (URS 1995e).

6.2.3 Pesticide Residue Tank (Building 206)

The Navy removed the pesticide tank and surrounding soils.

6.2.4 Public Works Transportation Building (Building 67)

Two monitoring wells were installed in the vicinity of the Public Works Transportation Building to determine whether chemicals used in the building (lubrication oils, petroleum distillates, thinners, lacquers, paints, and fuels) were released to the soils or groundwater. N-nitrosodipropylamine was detected in one well at the detection limit. Although the concentration exceeded MTCA B levels, it may be a false positive, because this chemical was not found in any other sample on site.

6.2.5 Auto Hobby Shop (Building 310)

The Navy removed the oil/water separator near the Auto Hobby Shop and removed adjacent soils during the expedited BRAC cleanup actions.

6.3 FUEL TANKS AND PIPING

6.3.1 Avgas Distribution System

Contaminated soils at the former avgas tank farm were excavated (URS 1995d).

6.3.2 Mogas Storage

Mogas was formerly stored in two USTs near Building 98. During the 1991 site inspection, TPH was detected in a subsurface soil sample at an elevated concentration. Soils adjacent to Building 98 were excavated (URS 1995d).

6.3.3 Underground Storage Tanks

All tanks have been removed or closed.

6.3.4 100,000-Gallon UST (Building 12)

The 100,000-gallon UST was closed in place in December 1994 (URS 1995c).

7.0 REFERENCES

- Alpha Engineering Group, Inc. (Alpha). 1993. *Asbestos Survey of NAVSTA PS Seattle, Seattle, Washington*. September 1993.
- Department of Defense (DoD). 1993. *BRAC Cleanup Plan (BCP) Guidebook*. Fall 1993.
- Hart Crowser. 1991. *Site Inspection Study, Site 1—Former Gasoline Storage Area, Naval Station, Puget Sound, Seattle, Washington*. May 15, 1991.
- Municipality of Metropolitan Seattle (Metro). 1975. *Water Circulation Studies of Lake Washington*.
- Naval Energy and Environmental Support Activity (NEESA). 1988. *Preliminary Assessment Report, Naval Station Puget Sound*. NEESA 13-162 PA.
- Soil Conservation Service, United States Department of Agriculture (SCS). 1992. *Naval Station Puget Sound and Remote Housing Sites, National Resources Management Plan*.
- United States Fish and Wildlife Service (USFWS). 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/UBS-79/31.
- United States Navy (U.S. Navy). 1992. *Naval Station Puget Sound at Sand Point*.
- URS Consultants, Inc. (URS). 1994a. *Technical Memorandum, Sampling Results for the Avgas Line and 100,000-Gallon Underground Storage Tank, CTO 0119*. January 13, 1994.
- . 1994b. *Draft Technical Memorandum, Sampling Results for the Avgas Line and Auto Hobby Shop Excavation, CTO 0149*. April 5, 1994.
- . 1994c. *Environmental Baseline Survey, CTO 0104*. June 30, 1994.

- . 1994d. *Draft Technical Memorandum, Sampling Results for UW Property Adjacent to Auto Hobby Shop, CTO 0119.* September 22, 1994.
- . 1994e. *Draft Technical Memorandum, Summer 1994 Sampling Results, Building 2, Building 30, Building 137, Avgas Tank Farm, Asphalt Roofs, Ballfield, CTO 0170.* October 24, 1994.
- . 1995a. *Base Realignment and Closure (BRAC) Cleanup Plan, CTO 0149.* January 13, 1995.
- . 1995b. *Underground Storage Tank Closure Report for 2,000-Gallon Gasoline UST at Steam Plant, CTO 0140.* May 9, 1995.
- . 1995c. *Underground Storage Tank Closure Report for 100,000-Gallon Fuel Oil UST, CTO 0140.* May 9, 1995.
- . 1995d. *Interim Remedial Action Report for the Former Avgas Tank Farm, CTO 0140.* May 9, 1995.
- . 1995e. *Draft Technical Memorandum, Sampling Results from the Groundwater and Soil Monitoring, CTO 0170.* September 7, 1995.
- . 1993a. *Site Inspection Report, Naval Station Puget Sound (Draft Final), CTO 0073.* February 8, 1993.
- . 1993b. *Site Inspection Report, NAVSTA PS Seattle, CTO 0104.* October 7, 1993.
- . 1993c. *Technical Memorandum, Naval Station Puget Sound Seattle, CTO 0104.* September 7, 1993.
- . 1993d. *Draft Technical Memorandum, Environmental Baseline Survey for Transfer, Avgas Lines and 100,000-Gallon Underground Storage Tank.* October 21, 1993.
- . 1991. *Preliminary Assessment, PSNS-NAVSTA Puget Sound, Sand Point, CTO 0045.* October 10, 1991.