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NSB NEW LONDON
5090.3a

DESIGN WORK PLAN
INTERIM REMEDIAL DESIGN

SPENT ACID STORAGE AND DISPOSAL AREA
AND
AREA A LANDFILL - CONCRETE PAD

Prepared For:

Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Lester, PA 19113-2090

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1.0 INTRODUCTION

1.1 Purpose and Scope

The Naval Submarine Base in New London (NSB-NLON) consists of approximately 547 acres of land and associated buildings in southeastern Connecticut in the towns of Ledyard and Groton. NSB-NLON is on the east bank of the Thames River, approximately 6.0 miles north of Long Island Sound. Figures 1-1 and 1-2 show the site vicinity and location, respectively. NSB-NLON was placed on the National Priorities List (NPL) on August 30, 1990 by the U.S. Environmental Protection Agency (U.S. EPA) pursuant to the comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.

The purpose of this design work plan is to present proposed interim remedial designs for two specific areas, the Spent Acid Storage and Disposal Area and the concrete pad area within the Area A Landfill (Area A Landfill/Concrete Pad Area), at NSB-NLON in Groton, Connecticut. These interim remedial actions are source excavation actions. In addition to the interim remedial actions which are the subject of this document, the following interim actions will also be implemented and will be discussed in separate documents.

- DRMO - Soil Remediation
- Area A Downstream/OBDA - Sediment Remediation
- Area A Landfill - Final Capping

These five items represent the actions necessary to prevent the release of contaminants into the environment and prevent human exposure to the contaminants. The Navy's goal is to begin interim remedial actions at NSB-NLON as quickly as possible to protect human health and the environment and to comply with applicable or relevant and appropriate requirements (ARARs). Pursuant to this goal, this design work plan has been prepared concurrently with conducting portions of the Phase II Remedial Investigation (RI) Work Plan (Atlantic, May 1993) that collect

INSTALLATION RESTORATION STUDY

NAVAL SUBMARINE BASE - NEW LONDON

GROTON, CT

SOURCE: Marshall Penn-York Co. Inc.

Miles

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APPROXIMATE SCALE

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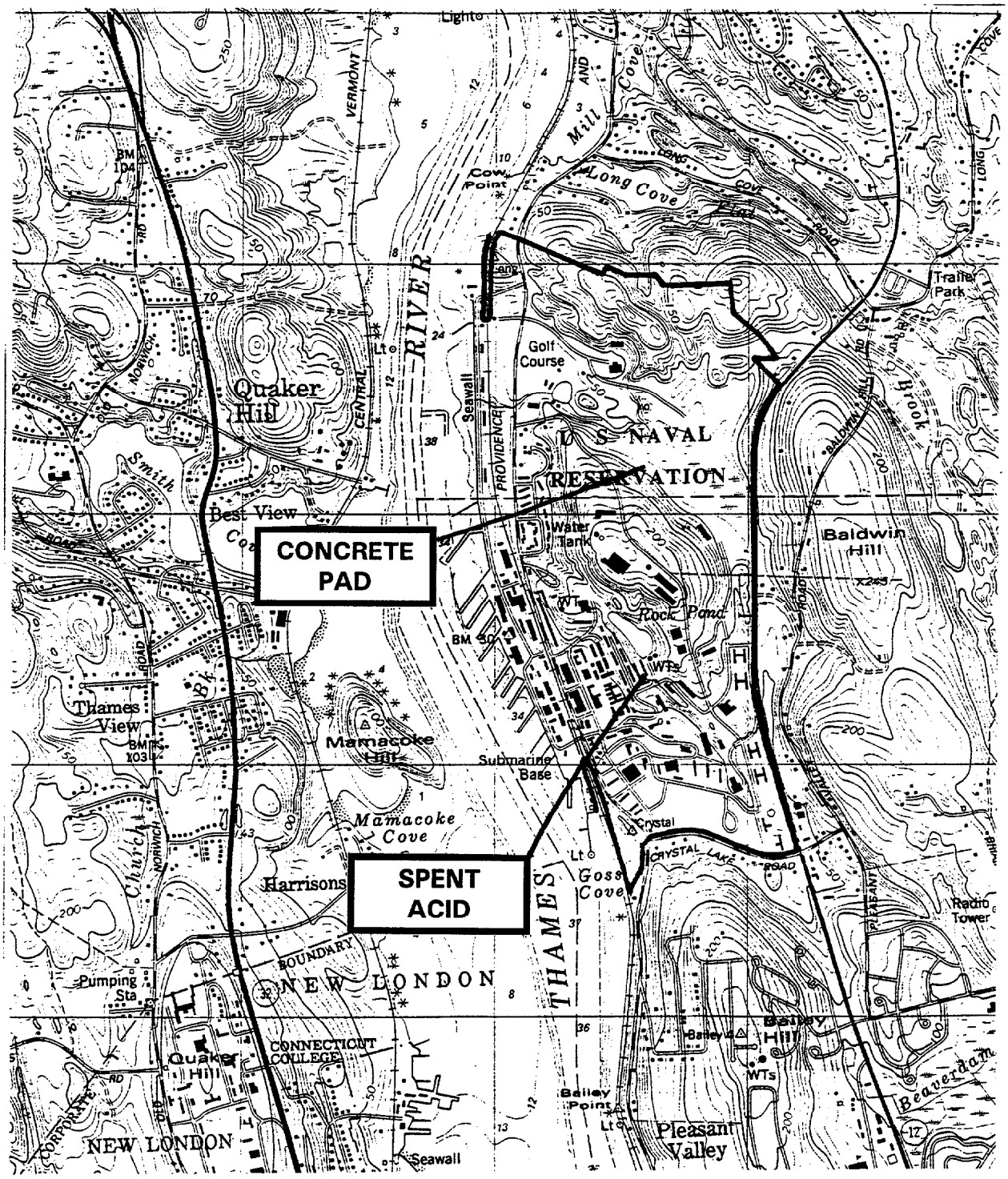
FIGURE 1-1

SITE VICINITY

ATLANTIC ENVIRONMENTAL SERVICES, INC.



INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE - NEW LONDON GROTON, CT	SOURCE: Uncasville, CT U.S.G.S. Topographic Map 1984 N	FIGURE 1-2 SITE LOCATION ATLANTIC ENVIRONMENTAL SERVICES, INC.

design data required to finalize these interim remedial designs.

This preliminary design document provides the following information for the Spent Acid Storage and Disposal Area, and the Area A Landfill/Concrete Pad Area:

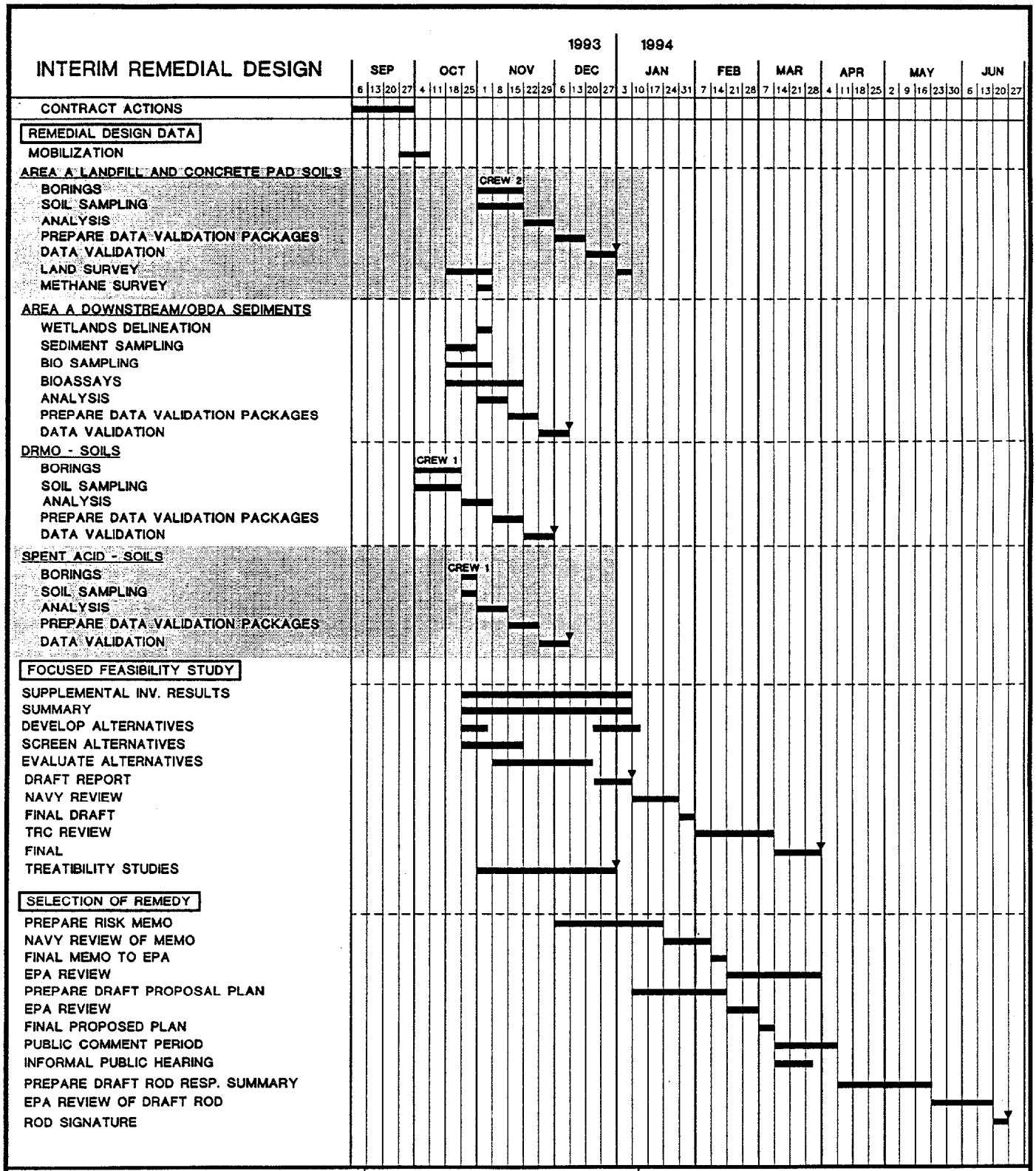
- Site Characteristics
- Interim Remedial Action Objectives
- Proposed Cleanup Levels
- Final Remediation Action
- Evaluation of Interim Remedial Design Alternatives
- Description of Work Items Required to Support the Remedial Action

The overall process of proceeding with the interim remedial actions is as follows:

- initiate remedial design and collection of supplemental data (laboratory analysis and engineering);
- complete focused feasibility study, including evaluation of collected data and remedial alternatives;
- develop proposed plan and record of decision (ROD);
- participate in ongoing public relations activities;
- complete design; and
- implement approved, interim remedial actions.

This document is the first phase of remedial design. Supplemental design data are currently being collected. Generalized schedules, showing all of the tasks to complete interim remedial actions for this project and the other interim remedial actions currently being implemented, are included in Tables 1-1 and 1-2.

Input from the Technical Review Committee (TRC) and regulatory agencies regarding the proposed interim remediation designs is requested at this time.



INSTALLATION RESTORATION STUDY

NAVAL SUBMARINE BASE - NEW LONDON

GROTON, CT

LEGEND

TASK TIME LINE

ENDING MILESTONE

TABLE 1-1
SUPPLEMENTAL DESIGN DATA/
FOCUSED FEASIBILITY STUDY/
PROPOSED PLANS/RODS
INTERIM REMEDIAL ACTIONS

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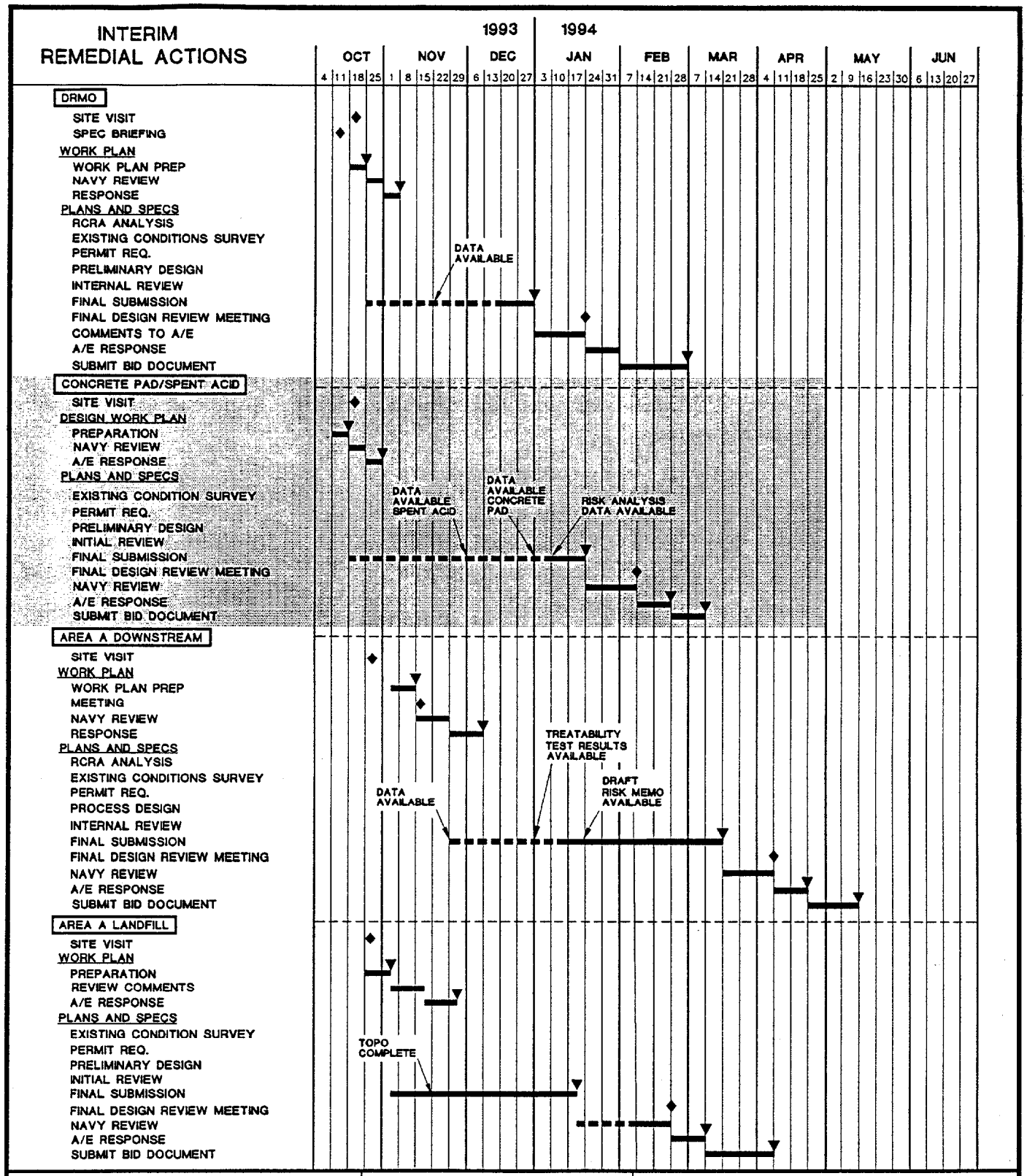

INSTALLATION RESTORATION STUDY

NAVAL SUBMARINE BASE - NEW LONDON

GROTON, CT

LEGEND

- TASK TIME LINE
- PART TIME TASK TIME LINE
- MILESTONE/DELIVERABLE
- MEETING

TABLE 1-2
SCHEDULE
DESIGN INTERIM REMEDIAL ACTIONS

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2.0 SITE CHARACTERISTICS

Regional geology and hydrology are described in the Phase I Remedial Investigation (RI) (August 1992, Atlantic), along with detailed, site background information and a description of the nature and extent of contamination. Presented herein for each site is a summary of its background-specific geology and hydrology, and the nature and extent of contamination.

2.1 Spent Acid Storage and Disposal Area — Soils

2.1.1 Site Background

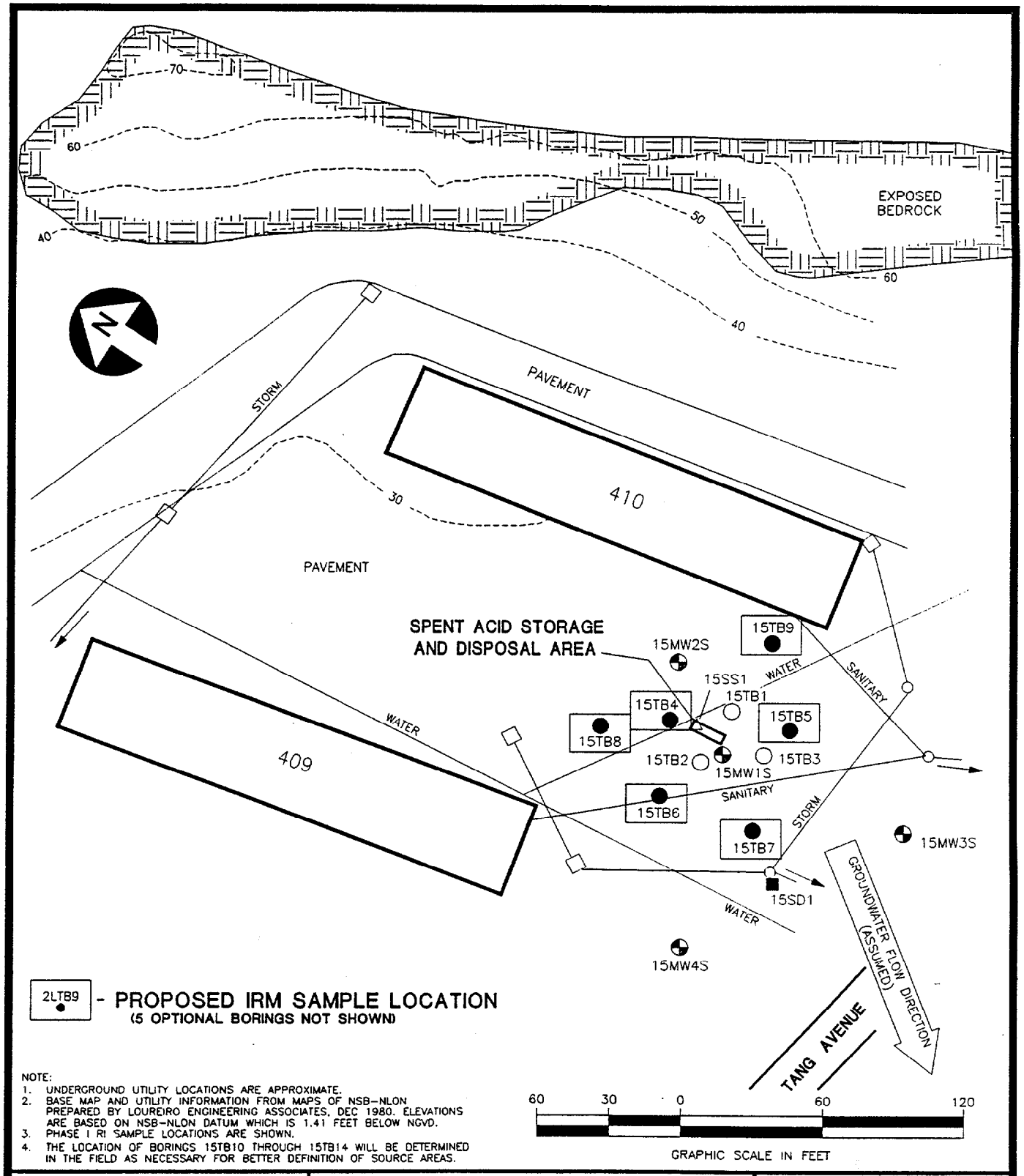
The site is located in the southeastern section of NSB-NLON in the southern portion of the area between Buildings 409 and 410. A 4 ft x 4 ft x 12 ft rubber-coated, underground tank was used for temporary storage of waste battery acid during World War II. The top of the tank is still visible, but the tank has been filled with earth and capped with concrete.

Figure 2-1 illustrates the location of soil borings performed during the Phase I RI, the soil borings currently being performed under the Phase II RI, and the monitoring wells to be installed at a later date under the Phase II investigation.

2.1.2 Site-Specific Geology and Hydrology

Site-specific geology has been determined, based on the Phase I Remedial Investigation and interpretation of the 1967 United States Geological Society (USGS) Bedrock Geologic Map, the 1983 Soil Conservation Service (SCS) Soils Map, and the 1960 USGS Surficial Geology Map.

The 1967 USGS Bedrock Geology Map shows that the site is underlain by a biotite-quartz-feldspar gneiss of the Mamacoke formation. Bedrock was not encountered during the subsurface investigation. The 1983 SCS Soils Map depicts the site area as urban land. This classification is consistent with conditions observed at the site. The 1960 USGS Surficial



NOTE:
1. UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE.
2. BASE MAP AND UTILITY INFORMATION FROM MAPS OF NSB-NLON PREPARED BY LOUREIRO ENGINEERING ASSOCIATES, DEC 1980. ELEVATIONS ARE BASED ON NSB-NLON DATUM WHICH IS 1.41 FEET BELOW NGVD.
3. PHASE I RI SAMPLE LOCATIONS ARE SHOWN.
4. THE LOCATION OF BORINGS 15TB10 THROUGH 15TB14 WILL BE DETERMINED IN THE FIELD AS NECESSARY FOR BETTER DEFINITION OF SOURCE AREAS.

INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE - NEW LONDON
GROTON, CT

LEGEND

EXIST.	PROP.	
15MW1	15MW1	MONITORING WELL
15TB1	15TB1	TEST BORING
15SD1	15SD1	SEDIMENT SAMPLE

----10----	EXIST CONTOUR
123	BUILDING No.
	WATERCOURSE
	MANHOLE
	CATCH BASIN

FIGURE 2-1
FIELD SAMPLING PLAN
SPENT ACID STORAGE AND DISPOSAL AREA

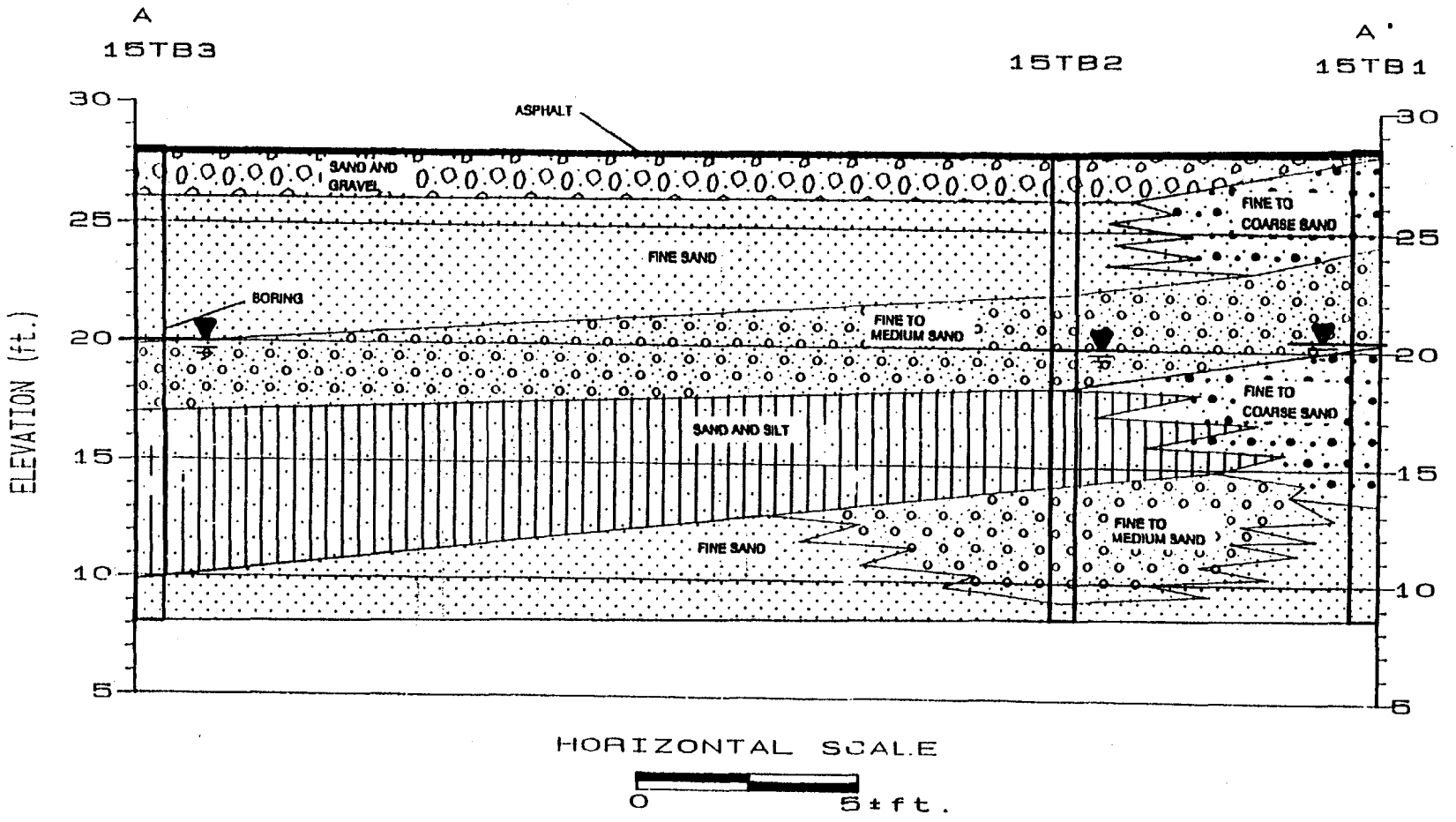
ATLANTIC ENVIRONMENTAL SERVICES, INC.

Geology map shows that the site is located in terrace deposits of the Thames River; these deposits consist of stratified silt, sand, and gravel deposited by gravel meltwater. Subsurface material observed at the site consists of fine-to-medium grained sands and silts with traces of clay. Where clay is present, it usually occurs in discrete, silty lenses of less than 0.5 inch in thickness. Rust-colored staining and mottling were common in borings from the east and south side of the spent-acid tank.

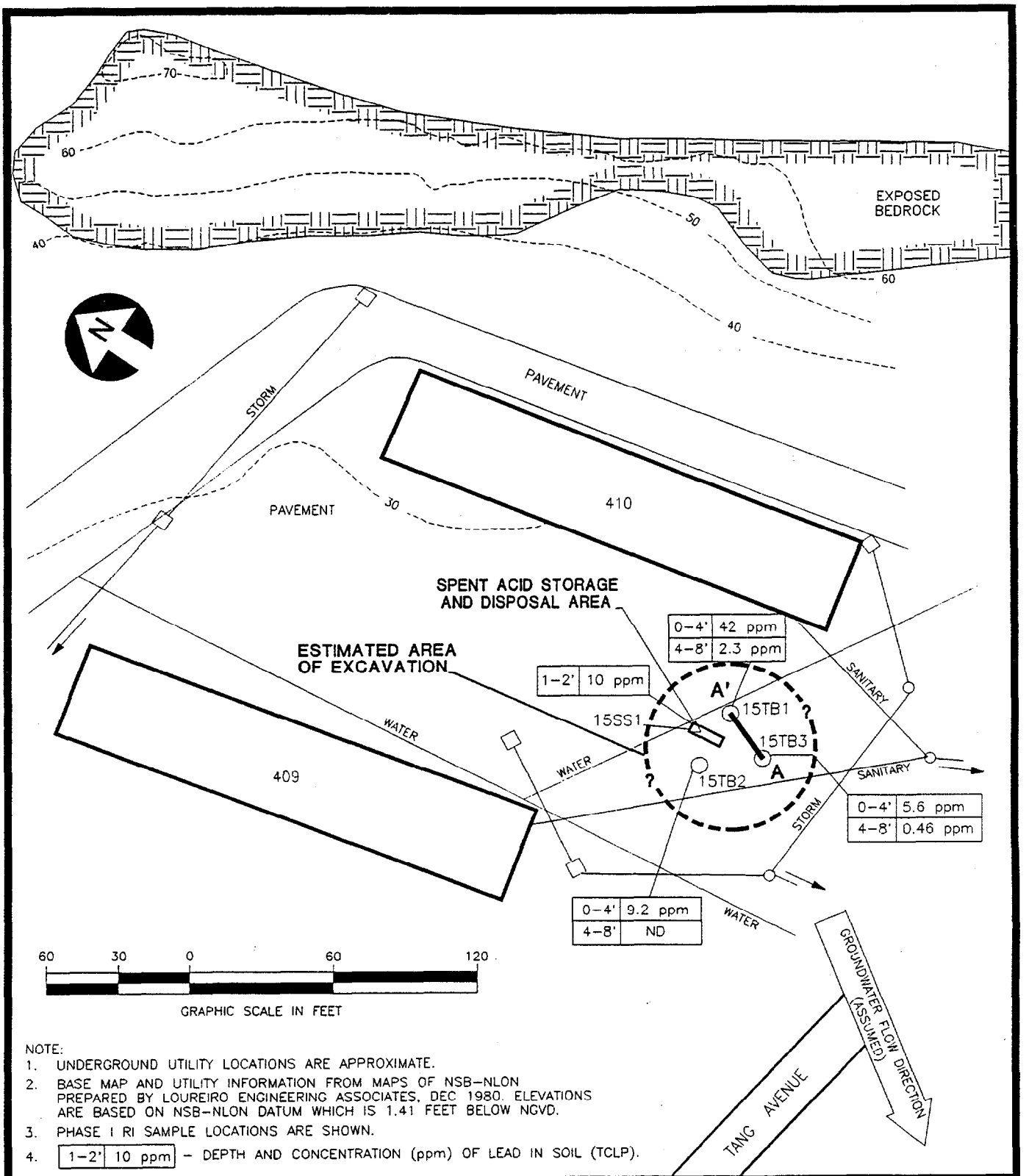
No groundwater monitoring was performed at this site. Groundwater was encountered at 6.0 to 8.0 feet below the surface during test borings. Groundwater flow is projected to be generally to the southwest. Figure 2-2 represents a geologic cross section of this site, which illustrates subsurface geology and water-table depth.

2.1.3 Nature and Extent of Contamination

Seven subsurface soil samples were collected during the Phase I investigation to search for potential release of battery acid from the subsurface tank. High levels of lead were present in 6 of 7 soil samples, based on Toxicity Characteristic Leaching Procedure (TCLP) analysis. Four samples were classified as hazardous waste under the Resource, Conservation, and Recovery Act (RCRA) because of the lead concentrations. These samples were collected at the 0 to 4-foot depth interval. Several soil samples also had low pH values. A summary of the lead concentrations in TCLP (Toxicity Characteristic Leaching Procedure) extract are included in Figure 2-3. The elevated levels of lead and low pH values indicate that a release of battery acid occurred. The present level of subsurface investigation has not defined the extent or degree of soil contamination. Therefore, as part of the overall remediation effort for this site, additional soil sampling and analysis will be conducted to determine the actual concentration of lead in the soils and the extent of lead contamination. As proposed, future investigation for this site is



INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE - NEW LONDON GROTON, CT	LEGEND GROUND WATER ELEVATIONS ARE ESTIMATED BASED ON BORING LOGS.	FIGURE 2-2 GEOLOGIC CROSS SECTION A-A' SPENT ACID ATLANTIC ENVIRONMENTAL SERVICES, INC.



NOTE:
1. UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE.
2. BASE MAP AND UTILITY INFORMATION FROM MAPS OF NSB-NLON PREPARED BY LOUREIRO ENGINEERING ASSOCIATES, DEC 1980. ELEVATIONS ARE BASED ON NSB-NLON DATUM WHICH IS 1.41 FEET BELOW NGVD.
3. PHASE I RI SAMPLE LOCATIONS ARE SHOWN.
4. 1-2' | 10 ppm – DEPTH AND CONCENTRATION (ppm) OF LEAD IN SOIL (TCLP).

INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE - NEW LONDON
GROTON, CT

LEGEND

⊕ 15MW1	MONITORING WELL	A ——— A'	CROSS SECTION
○ 15TB1	TEST BORING	----10----	EXIST CONTOUR
		123	BUILDING No.
			WATERCOURSE
		○	MANHOLE
		□	CATCH BASIN

FIGURE 2-3
SITE PLAN
SPENT ACID STORAGE AND DISPOSAL AREA

ATLANTIC ENVIRONMENTAL SERVICES, INC.

specified in the Phase II RI work plan. Those portions of the work plan regarding the extent of lead-contaminated soil, as specified in the Proposed Interim Remedial Actions Briefing Document (Atlantic May 1993), will be conducted first as to allow the timely implementation of remediation of this site. In general, these data collection requirements will consist of drilling of up to 11 borings, field screening for lead by X-ray fluorescence (XRF), and laboratory analysis of up to 11 samples. The boring locations are illustrated in Figure 2-1.

2.2 Area A Landfill/Concrete Pad (Soils)

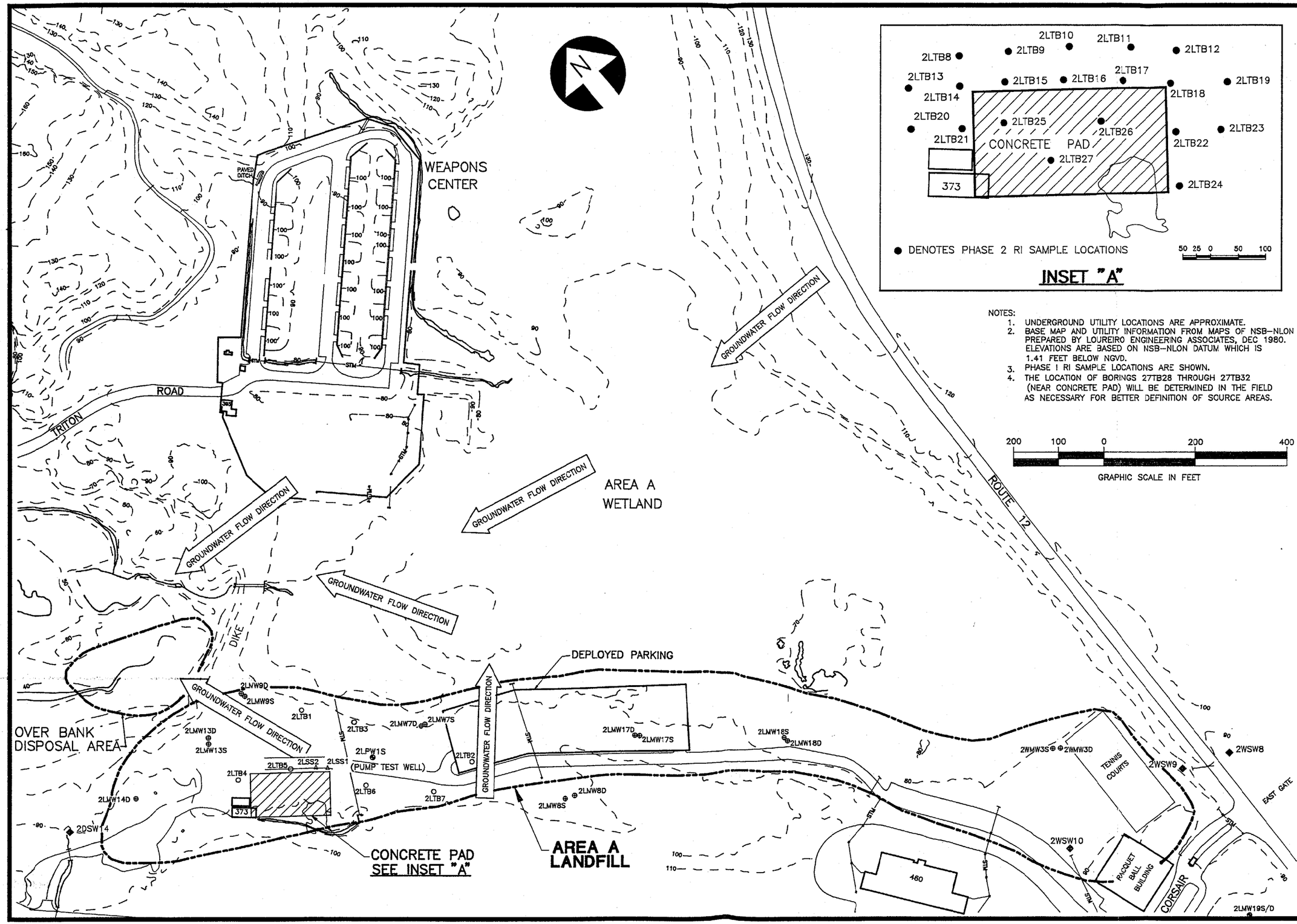
2.2.1 Site Background

The Area A landfill/concrete pad is located in the northeastern and north-central section of NSB-NLON. The site is approximately 7 acres in size. Access is via a dirt road off Wahoo Avenue. The Area A landfill is a relatively flat area bordered by a steep, wooded hillside that rises to the south, a steep wooded ravine to the west, and the Area A wetland to the north. Aerial photographs show that the landfill appears to have extended east along the wetland as far as the present position of the tennis courts. Run-off from the landfill drains as overland flow north into the Area A wetland, which discharges to the Area A downstream and into the Thames River.

Figure 2-4 illustrates the location of soil borings, the monitoring installations performed during the Phase I RI, and the soil borings currently being performed under the Phase II RI.

The landfill opened before 1957. The base incinerator ceased operating in 1963 and, from 1963 to 1973, all wastes were disposed unburned in the landfill. During this time, all non-salvageable materials generated by submarines and base operations were disposed in the Area A landfill.

Landfill operations ceased in 1973. After closure, a bituminous concrete pad was



NOTES:
1. UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE.
2. BASE MAP AND UTILITY INFORMATION FROM MAPS OF NSB–NLON PREPARED BY LOUREIRO ENGINEERING ASSOCIATES, DEC 1980. ELEVATIONS ARE BASED ON NSB–NLON DATUM WHICH IS 1.41 FEET BELOW NGVD.
3. PHASE I RI SAMPLE LOCATIONS ARE SHOWN.
4. THE LOCATION OF BORINGS 27TB28 THROUGH 27TB32 (NEAR CONCRETE PAD) WILL BE DETERMINED IN THE FIELD AS NECESSARY FOR BETTER DEFINITION OF SOURCE AREAS.

FIGURE 2–4
FIELD SAMPLING PLAN
AREA A LANDFILL, WETLAND AND WEAPONS CENTER

ATLANTIC ENVIRONMENTAL SERVICES, INC.

LEGEND

—10—	EXIST CONTOUR
123	BUILDING No.
	WATERCOURSE
—STM—	STORM SEWER
□	CATCH BASIN

EXIST.	PROP.	
⊕ 6MW1	⊕ 7MW5	MONITORING WELL
○ 6TB1	● 7TB5	TEST BORING
□ 2DSD1	■ 2DSD5	SEDIMENT SAMPLE
△ 6SS1	▲ 7SS5	SURFACE SOIL SAMPLE
◇ 2DSW1	◆ 2DSW5	SURFACE WATER SAMPLE

INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE–NEW LONDON
GROTON, CONN.

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constructed in the southwest portion of the landfill for aboveground storage of industrial wastes. The remainder of the landfill is not paved. At the time of the Initial Assessment Study, 42 steel drums, 87 transformers (mineral and polychlorinated biphenyls [PCB]), and 60 to 80 electric switches were stored on the pad. Two transformers and several electrical switches were leaking at that time. Past leakage of oil was also evident. Most drums were stacked on wooden pallets; drums with PCB labels were covered and bound with plastic sheeting. All of these materials have been properly disposed off site.

In recent years, sand bags and contractor supplies and equipment have been stored over the former landfill. Several transformers, excavated underground storage tanks, crane weights, and other equipment are stored on the concrete pad in the southwest portion of the landfill. The specific items stored in this area changed over time. A gravel-covered, long-term, vehicle parking lot (deployed parking) also exists on the former landfill.

The construction of a paved parking lot on the southeast end of the Area A Landfill was planned, but has been delayed indefinitely.

2.2.2 Area A Landfill Site-Specific Geology and Hydrology

Site-specific geology has been determined during the Phase I RI and interpretation of the 1967 USGS Bedrock Geology Map, the 1983 SCS Soils Map, and the 1960 USGS Surficial Geology Map.

The 1983 SCS Soils Map shows most of the Area A landfill as udorthents-urban land.

The 1960 USGS Surficial Geology Map shows nonstratified drift in the Area A landfill. This classification is consistent with soils observed: (1) below the fill material and dredge spoil in the eastern portion of the landfill, and (2) soils at the surface in the western portion of the landfill.

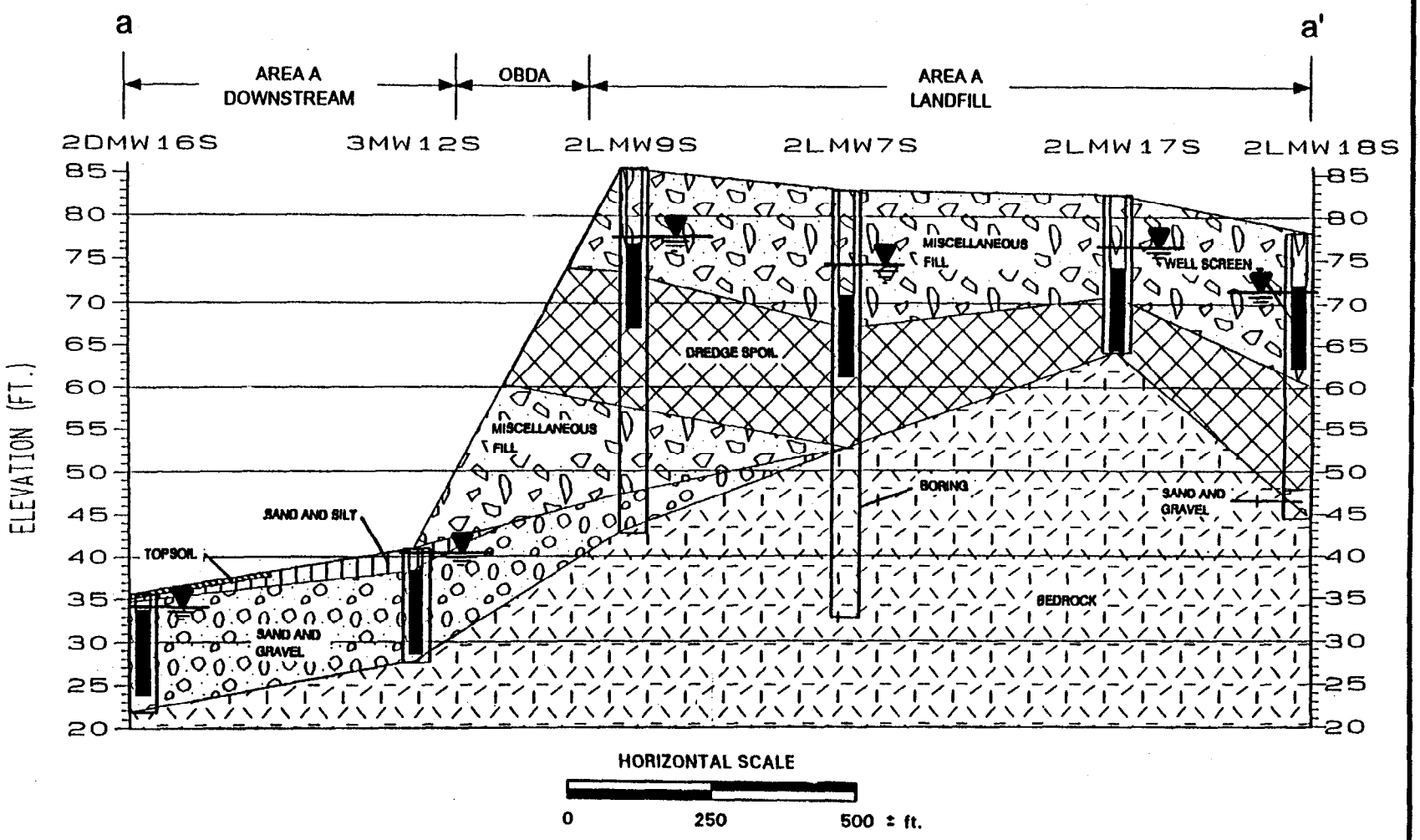
Subsurface investigations indicate that the Area A landfill is underlain by 10 to 20 feet of miscellaneous fill material, which is generally underlain by 10 to 20 feet of dredge spoil. On the southwestern side, fill material is underlain by compact sand, silt, and gravel, which extend down to bedrock.

The 1967 USGS Bedrock Geology Map shows that the bedrock underlying the majority of Area A is the biotite-quartz-feldspar gneiss of the Mamacoke Formation. The map indicates that all of the Area A landfill and Over Bank Disposal Area (OBDA), the southern portion of the Area A wetland, and the northern and eastern portions of the Area A downstream are underlain by bedrock of the Mamacoke Formation.

Bedrock cores were drilled at 2 monitoring well locations within the Area A landfill. The mineralogy and texture of the bedrock cores is generally consistent with that of the biotite-quartz-feldspar gneiss of the Mamacoke Formation.

Groundwater in the central-eastern portion of Area A landfill flows north toward the Area A wetland. Groundwater in the northwestern portion of the Area A landfill flows northwest toward the Area A downstream and eventually flows to the Thames River.

Slug-displacement test data were used to estimate the *in situ* hydraulic conductivity of material in this area. The geometric, mean hydraulic conductivity of the landfill material and the underlying dredge spoil combined was calculated to be 3.2 feet/day. The velocity of groundwater flow through material in the landfill and wetland portions of Area A was estimated to be 0.04 feet/day (with a hydraulic conductivity of 3.2 feet/day), a porosity of 0.30 and hydraulic gradient of approximately 0.004. Figure 2-5 is a geologic cross section of the Area A landfill and Area A downstream/OBDA, which illustrates the subsurface geology, landfill material (miscellaneous fill), and the water table.



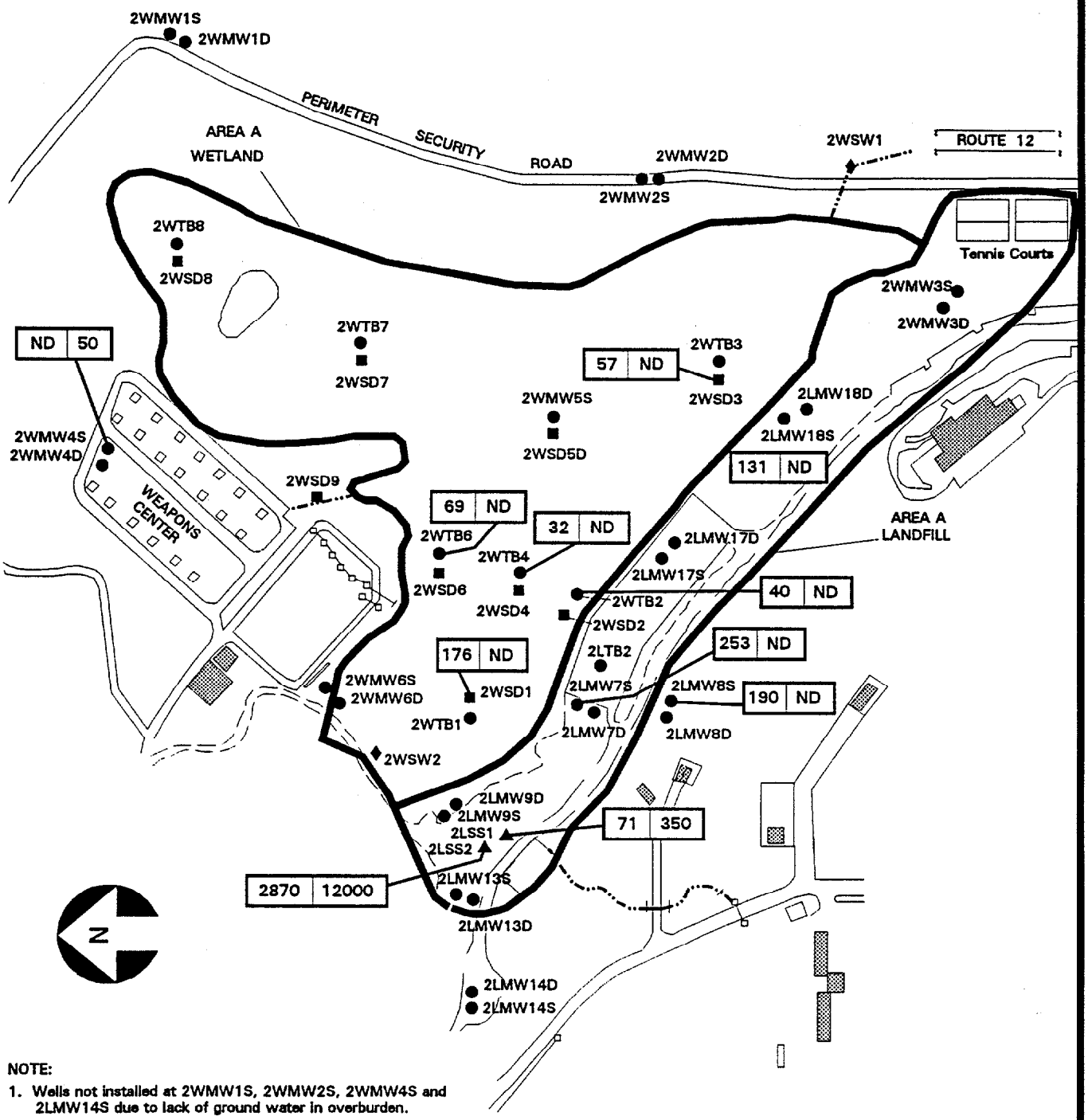
INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE - NEW LONDON GROTON, CT	GROUND WATER ELEVATION DATA: MARCH 21, 1991	FIGURE 2-5 GEOLOGIC CROSS SECTION A-A' AREA A ATLANTIC ENVIRONMENTAL SERVICES, INC.

2.2.3 Area A Landfill — Nature and Extent of Soil Contamination

No PCBs were detected in the subsurface soils within the Area A Landfill. One surface soil sample contained PCBs above the TBC concentration of 10,000 ppb. This soil sample was collected near the concrete storage pad where drums, PCB transformers, and electric switches were once stored. Based on the two surface soil sample locations, the extent of the PCBs in this area was not defined at this time. Therefore, as part of the interim remediation of this site additional soil sampling and analysis is being conducted to determine the extent of the PCBs contamination in this area. All proposed future investigation for this area are specified in the Phase II RI Work Plan. Those portions of the Work Plan regarding the extent of PCB-contaminated soil as specified in the Briefing Document, are currently being conducted to allow the timely implementation of remediation of this area. In general, these data collection requirements will consist of drilling of up to 25 borings, field screening with a gas chromatograph for PCBs, and laboratory analysis of up to 13 soil samples. In addition, four samples of the concrete pad will be collected to determine if it is contaminated with PCBs. The boring locations are illustrated in Figure 2-4.

The remainder of this subsection describes the soil chemical characteristics for the landfill beyond that previously discussed for the concrete pad area. This information will be discussed in detail in a subsequent work plan for the landfill cap design. Sample locations at the landfill are shown in Figure 2-6.

Pesticides were detected at three subsurface sample locations (2LMW7S, 2LMW8S, and 2LMW18S) at the Area A landfill. DDT, DDD, and DDE (DDTR) were detected at these locations at relatively low concentrations below TBC values. DDT was present above the TBC value of 500 ppb at one surface-soil sample near the concrete storage pad.



NOTE:

1. Wells not installed at 2WMW1S, 2WMW2S, 2WMW4S and 2LMW14S due to lack of ground water in overburden.
2. Sediment sample locations are approximate. See Plate 4-1 for specific sample locations.
3. No data presented indicates parameters not detected.

INSTALLATION RESTORATION STUDY

NAVAL SUBMARINE BASE - NEW LONDON

GROTON, CT

LEGEND

- TB1 - Test Boring
- MW1 - Monitoring Well
- SD1 - Sediment Sample
- SS1 - Surface Soil Sample

Pesticides ppm	PCBs ppm

- SW1 - Surface Water Sample
- Building
- Watercourse

Approximate Scale 0 200'

FIGURE 2-6
SUMMARY OF TOTAL PESTICIDES/PCBS DATA IN SOILS/SEDIMENTS
AREA A
LANDFILL AND WETLAND

ATLANTIC ENVIRONMENTAL SERVICES, INC.

VOC concentrations in the subsurface soil within the Area A landfill were generally low. No to be considered (TBC) values for VOCs in soil samples were exceeded. One surface soil sample collected near the concrete storage pad did contain elevated levels of petroleum hydrocarbons. Semivolatile organic compounds (SVOCs), principally polycyclic aromatic hydrocarbons (PAHs), were detected at relatively low levels in several subsurface soil-samples from the landfill. The results of the SVOCs analyses at the Area A landfill were significantly lower than at the former landfill sites of Defense Reutilization and Marketing Office (DRMO) and Goss Cove. The organic results, in general, do not indicate significant disposal of organic chemicals within the Area A landfill.

Of the 12 subsurface samples analyzed by TCLP, 10 contained one or more metals exceeding TBC values. Metals exceeding TBC values included arsenic, cadmium, lead, and selenium. TCLP extract values, which characterize a waste as a hazardous waste were not exceeded for any samples. Several inorganic constituents (including beryllium, cadmium, lead, and mercury) exceeded established background levels, based on mass analysis. Other inorganics exceeding background levels included copper, nickel, and boron. The majority of these elevated inorganics probably are related to past landfill disposal.

The lead and cadmium values are generally low and do not indicate the existence of a major source, such as the historical disposal of battery acid reported in this area. Levels of cadmium and, particularly, lead were much higher at the spent acid storage and disposal area and DRMO, where battery-acid storage tanks existed.

The presence of PCBs in surface soils in the concrete pad area is of most significance relative to the human health risks associated with the Area A landfill. Figure 2-6 provides a summary of the PCB and pesticide soils/sediment data for this area.

3.0 INTERIM REMEDIAL DESIGN

3.1 Spent Acid Storage and Disposal Area

3.1.1 Interim Remedial Action Objectives and Remediation Target Levels

The only contaminant of concern detected to date at the Spent Acid Storage and Disposal Area is lead. The objective of the interim remedial action is to reduce the exposure of future construction workers on the site to the incidental ingestion of lead in soils and reduce the leachate generated from lead-contaminated soils. It is also desired to implement a permanent remedy that will not require post-closure care and periodic reviews of the remedy.

The preliminary remediation action target level for lead in soils is 500 ppm. This target level is at the lower end of the range (500-1,000 ppm) recommended by EPA. The final remediation action target levels could be revised based on the results of supplemental field investigation and further risk analysis. The action level will be finalized when the record of decision (ROD) is signed. The preliminary remediation action target level of 500 ppm for lead in soils will be used in the preliminary interim remedial design. The lower end of the range is being used so that no future restrictions will be required at this site.

3.1.2 Final Remediation Actions

The remainder of the work specified in the Phase II RI Work Plan for the Spent Acid Disposal and Storage Area consists of the installation of groundwater monitoring wells. The monitoring wells will be sampled periodically to assess site groundwater quality and evaluate site groundwater hydrology. The locations of the monitoring wells are identified in Figure 2-1. Three shallow wells and one deep well will be installed down gradient of the spent acid area. One shallow well will be installed up gradient of the spent acid area.

The results of the chemical analysis on the groundwater samples will be evaluated to

determine whether any further action is required to remediate groundwater at this site. No further remedial activities to address contaminated soils at this site are anticipated after the completion of the interim remediation.

3.1.3 Evaluation of Alternatives

To document the rationale for selection of the proposed interim remedial action, a focussed feasibility study (FFS) will be performed. Additional remedial design data are currently being collected to support the FFS and remedial design efforts. The preliminary evaluation of alternatives presented below is based on data currently available from the Phase I RI and preliminary work done in preparing a feasibility study based on the Phase I RI. Work on this feasibility study was put on hold, pending completion of the Phase II RI. Portions of the feasibility study will be completed as FFSs for interim remedial action. Based on screening of technologies, several alternatives, as shown in Table 3-1, were selected for a screening evaluation. Three alternatives have been retained for further analysis, based on initial screening of the technologies during the feasibility study and the elimination of any alternatives that did not include available, cost-effective, and proven technologies. The three alternatives retained for further evaluation (shaded in Table 3-1) are as follows:

- containment via installation of an impermeable surface cap;
- excavation of contaminated material followed by aboveground stabilization of the excavated material and disposal on site; and
- excavation of contaminated material followed by disposal off site at a landfill permitted for the disposal of hazardous waste under RCRA (RCRA landfill).

The installation of an impermeable cap to prevent infiltration of surface water would reduce the leachate generated from the lead contaminated soils; however, capping the site does not provide a permanent remedy, and post-closure care and periodic reviews of the remedy

TABLE 3-1
SPENT ACID STORAGE AND DISPOSAL AREA - SOILS
DEVELOPMENT OF ALTERNATIVES

RETAINED PROCESS OPTIONS	ALTERNATIVES						
	LIMITED ACTION		CONTAINMENT	OFF-SITE ALTERNATIVE	ON-SITE ALTERNATIVES		
SOIL/SEDIMENT	No Action	Access Restriction	Surface Cap	RCRA Landfill	In situ Stabilization	Above-ground Stabilization	Soil Washing
	6LEAD-1	6LEAD-2	6LEAD-3	6LEAD-4	6LEAD-5	6LEAD-6	6LEAD-7
No Action	●						
Access Restriction		●	●				
Horizontal Barrier - Cap			●				
Surface Water Control			●				
Excavation - Backhoe				●		●	●
In situ Stabilization					●		
Soil Washing							●
Stabilization				●[1]		●	●[1]
On-site Backfill						●	●[2]
Off-site RCRA Chemical Landfill				●			●[2]

Notes:
1. Optional, depends on TCLP analysis. Off-site stabilization can be performed at the selected off-site RCRA landfill.
2. Fine-grained (contaminated) soils separated by the soil washing process will be landfilled, while the larger soil particles will be backfilled.
3. Shading indicates alternatives to be evaluated during the focused feasibility study.

would be required. Also, if future construction work had to be performed in this area, workers would potentially be exposed to lead-contaminated soil. Because the area of lead contaminated soil is anticipated to be limited, providing a permanent remedy for the site via excavation of the source is anticipated to be more cost effective than long term monitoring and maintenance of the site required with a cap.

Once the contaminated soil has been excavated, the soil can be shipped off site to be disposed of in a RCRA land fill, or it can be treated on site. Because lead is an inorganic element, few treatment technologies are available, and none result in the destruction of the lead. Aboveground stabilization of the excavated material would reduce the leachate generated from the lead-contaminated soils. However, disposal of the stabilized material on site would require some type of cover to prevent direct contact and erosion, periodic reviews on the remedy, and post-closure care at the location of the disposal. Because the amount of soil currently anticipated to be excavated is relatively small, disposal of the material at an off-site RCRA landfill is the more attractive alternative at this time as it eliminates the cost of post-closure care on site. Pretreatment of the contaminated material may be required prior to disposal in a RCRA landfill. This pretreatment will most likely consist of stabilization and can be performed off site at the landfill.

The FFS will contain a detailed description of the screening of technologies, screening of alternatives, and cost evaluation of each alternative. The FFS will be based on the results of the supplemental field investigation currently being performed, which will define the actual extent of contamination. Based on the preliminary evaluation, excavation of the lead-contaminated material and disposal of the material at an off-site RCRA landfill is the recommended interim remedial action for the Spent Acid Storage and Disposal Area at this

time. Therefore, the interim remedial design is proceeding for this alternative.

3.1.4 Interim Remediation Work Items

The interim remediation for this site consists of the excavation of lead-contaminated soils followed by off-site disposal at a RCRA landfill.

Based on the Phase I RI soil analyses results, the estimated area to be excavated for the interim remediation of the spent acid area is shown in Figure 2-3. The estimated depth of the excavation is approximately 6.0 feet. Approximately 1,500 cubic yards of soil will be excavated, based on the preliminary estimate of the extent of lead-contaminated soils. The results of the Phase II RI currently being conducted will define more completely the actual extent of the excavation. Therefore, the actual amount of soil to be excavated could increase or decrease.

Prior to the start of the excavation, underground utilities will be located to determine if any conflicts exist. The work at the site will be coordinated with the Navy to minimize any interferences with Sub Base operations.

The 4 ft x 4 ft x 12 ft rubber-coated, steel underground tank which was used for the temporary storage of waste battery acid will be removed during the excavation and disposed of off site. The top of the tank is visible from the surface. The tank currently is filled with earth and capped with concrete.

The depth to groundwater at the site is between six to eight feet. The excavation currently is not expected to extend below this depth. Therefore, dewatering and water treatment will not be required for the interim remedial action at this site.

The vertical extent of contamination will also be determined from the Phase II RI work discussed previously. If the surface soils are determined to be clean, these soils will be

excavated, stockpiled separately, tested, and backfilled if suitable.

The contaminated soils will be excavated and either loaded and immediately shipped off site or temporarily stored on site in roll-off containers or in stockpiles. If the contaminated soils are stockpiled, on-site lined stockpile areas will have to be prepared. The stockpile area will be constructed to prevent leachate from the excavated soils stockpile from contacting surface soils and be located within this site.

The excavation will be filled with clean gravel and/or fill as soon as possible after the contaminated soil has been excavated and the site will be graded and paved.

The following design work items will be completed for this interim remedial action.

- Topographical Survey of Existing Conditions
- Utility Locations
- Permit Requirements Investigation
- Soil Disposal Assessment and Determination of Acceptable Landfills
- Preliminary Design Plans
  - Existing Conditions
  - Final Grades
  - Boring Logs
  - Civil Details
  - Removal Profile
- Finalization of Limits of Excavation Based on Review of Supplemental Data
- Design of Pavement Replacement and Site Restoration
- Preparation of Contract Plans and Specifications for Bidding

3.2 Area A Landfill/Concrete Pad

3.2.1 Interim Remedial Action Objectives and Remediation Target Levels

The most significant health risk associated with the Area A Landfill is the presence of PCBs in surface soils near the concrete pad. The objective of the interim remedial action for the Area A Landfill/Concrete Pad site is to remove "hot spots" from the Area A landfill near the concrete pad and to reduce exposure of workers to PCBs in surface soils. The Area A landfill cap is being included in a separate interim remedial design work plan.

The preliminary remediation action target level for PCBs in soil at this site is 10 ppm. The Connecticut Department of Environmental Protection (CTDEP) guidance target value for PCBs in soil is 2 ppm, and the U.S. EPA regulatory guidance for PCBs in soil is 10 ppm. The remediation action target level for PCBs in soil was chosen to be the higher value of 10 ppm because the area will be capped and there will be long-term maintenance and groundwater monitoring at this site. Also, the 2 ppm value is a CTDEP guidance value and not a regulatory standard or ARAR for PCBs in soil. The final remediation action target levels will be determined from the results of supplemental field investigation and further risk analysis. The action level will be finalized when the ROD is signed.

3.2.2 Final Remediation Actions

Interim remedial actions for the Area A Landfill, which includes the Concrete Pad area, will be discussed in a separate work plan.. The currently proposed interim remedial action for the Area A Landfill consists of containment of the landfill via capping, control of surface water, and controlling the overburden upgradient groundwater flow. Long-term maintenance and groundwater monitoring will be conducted at this site after the interim remediation of the Area A Landfill. The remainder of the work in the Phase II RI work plan for the Area A Landfill

consists of the installation of groundwater monitoring wells. The monitoring wells will be sampled periodically to assess site groundwater quality and evaluate site groundwater hydrology.

The results of the chemical analysis on the groundwater samples will be evaluated to determine whether any further action is required to remediate groundwater at this site. A groundwater pump and treat system may be required at this site to address contaminants detected in groundwater down gradient of the Area A landfill. PCBs have not been detected in groundwater samples down gradient of the concrete pad. Therefore, no further remedial activities to address PCB-contaminated soils or groundwater at this site are anticipated after completion of the interim remediation.

3.2.3 Evaluation of Alternatives

To document the rationale for selection of the proposed interim remedial action, a focussed feasibility study (FFS) will be performed. Additional remedial design data are currently being collected to support the FFS and remedial design efforts. The preliminary evaluation of the alternatives presented herein are based on data currently available from the Phase I RI and preliminary work done in preparing a feasibility study based on the Phase I RI. Work on this feasibility study was put on hold, pending completion of the Phase II RI. Portions of the feasibility study will be completed as FFSs for interim remedial action. Based on screening of technologies, several alternatives, as shown in Table 3-2, were selected for a screening evaluation. Three alternatives have been retained for further analysis, based on initial screening of the technologies during the feasibility study and the elimination of any alternatives that did not include available, cost-effective, and proven technologies. The three alternatives retained for further evaluation are indicated (as shaded) in Table 3-2. The interim remedial actions discussed in the Briefing Document consist of excavating the soils around the concrete

TABLE 3–2
AREA A LANDFILL AND CONCRETE PAD – SOILS
DEVELOPMENT OF ALTERNATIVES

RETAINED PROCESS OPTIONS	ALTERNATIVES									
	LIMITED ACTION		CONTAINMENT	OFF–SITE ALTERNATIVES[3]		ON–SITE ALTERNATIVES				
SOIL/SEDIMENT	No Action	Access Restriction	Surface Cap	Incineration	RCRA Landfill	In situ Stabilization	Above–ground Stabilization	Incineration[1]	Low Temperature Thermal Desorption[1]	Solvent Extraction[1]
	2L–1	2L–2	2L–3	2L–4	2L–5	2L–6	2L–7	2L–8	2L–9	2L–10
No Action	●									
Access Restriction		●	●							
Horizontal Barrier – Cap			●							
Site Grading & Stormwater Management			●							
Dewatering			●							
Excavation – Backhoe				●	●		●	●	●	●
In situ Stabilization						●				
Solvent Extraction										●
Stabilization							●			
On–site Incineration								●		
Off–site Incineration				●					●[2]	●[2]
On–site Low Temp Thermal Desorption									●	
On–site Backfill							●	●	●	●
Off–site RCRA Chemical Landfill					●					

1. Feasibility of these alternatives is contingent upon specified alternative being selected for remediation of DDTR–contaminated sediments in Area A downstream.
2. The condensed/extracted PCB and spent carbon will be transported offsite for incineration if an afterburner is not used.
3. Off–site low temperature thermal desorption or off–site reuse (asphalt or cement) will be reconsidered if a permitted off–site facility is located.
4. Shading indicates alternatives to be evaluated during the focused feasibility study.

pad with PCB concentrations above the target levels to eliminate "hot spots" and the installation of an impermeable cap. The impermeable cap will be evaluated for the entire Area A Landfill and therefore will be discussed in a separate work plan. The following alternatives for disposal or treatment of the excavated soils have been evaluated:

- on-site treatment of the excavated PCB-contaminated soils via low temperature thermal desorption; and
- off-site disposal of the excavated PCB-contaminated soils at a RCRA landfill.

On-site treatment of the excavated PCB-contaminated soils via low temperature thermal desorption has been considered as an alternative to off-site disposal. Thermal treatment of PCB-contaminated soils potentially may form dioxins which in turn must be destroyed or removed from the air stream prior to exhausting to the atmosphere. The air pollution control equipment required for the thermal treatment of PCB-contaminated materials make this alternative costly and unattractive. In addition, the very high contaminant destruction removal efficiency (99.9999%) required under the Toxic Substance Control Act (TSCA) also make this alternative difficult to implement.

The currently proposed interim remedial action consists of the excavation of PCB-contaminated soils from around the concrete pad and off-site disposal of the contaminated soil at a RCRA landfill. This evaluation is based on the available data, which indicate that the amount of PCB-contaminated soil to be excavated is relatively small. The FFS will contain a detailed cost and technical evaluation of the alternatives. The FFS will be based on the results of the supplemental field investigation currently being performed, which will define the actual extent of contamination. Therefore, the interim remedial design is proceeding for this alternative.

3.2.4 Interim Remediation Work Items

The interim remediation of this site consists of the excavation of PCB-contaminated materials in the area of the concrete pad followed by off-site disposal at a RCRA landfill.

The estimated area to be excavated for the interim remediation of the Area A Landfill/ Concrete Pad is based on the Phase I RI soil analysis results. PCBs were detected in surface samples only in this area; therefore, the estimated depth of excavation is two to four feet. The extent of surface-soil contamination in this area was not defined in the Phase I RI. It is estimated, however, that approximately 500 cubic yards of soil and possibly portions of the concrete pad will be excavated. The results of the Phase II RI currently being conducted will define more completely the actual extent of the excavation. Therefore, the actual amount of soil to be excavated could increase or decrease.

Prior to the start of the excavation, underground utilities will be located to determine if any conflicts exist. The work at the site will be coordinated with the Navy to minimize any interferences with Sub Base operations.

The depth to groundwater at this site is between five to ten feet. The excavation currently is not expected to extend below this depth. Therefore, dewatering and water treatment will not be required for the interim remedial action at this site.

The contaminated soils will be excavated and either loaded and immediately shipped off site or temporarily stored on site in containers or in stockpiles. If the contaminated soils are stockpiled, on site, lined stockpile areas will have to be prepared. The stockpile area will be constructed to prevent leachate from the excavated soils stockpile from contacting surface soils.

The excavation will be filled with clean gravel and/or fill as soon as possible after the contaminated soil has been excavated and the site graded.

The following design work items will be completed for each interim remedial action:

- Topographical Survey of Existing Conditions
- Utility Locations
- Permit Requirements Investigation
- Soil disposal Assessment and Determination of Acceptable Landfills
- Preliminary Design Plans
  - ▲ Existing Conditions
  - ▲ Final Grades
  - ▲ Boring Logs
  - ▲ Cap Details
  - ▲ Civil Details
  - ▲ Removal Profile
- Finalize Limits of Excavation Based on Review of Supplemental Data
- Design Pavement Replacement and Site Restoration
- Prepare Contract Plans and Specifications for Bidding