ATLANTIC
ENVIRONMENTAL SERVICES, INC.

engineers
geologists
scientists

MEMORANDUM
JULY 17, 1990

TO: NSB-NLON TRC Members

FROM: Paul Burgess, Project Manager
Atlantic Environmental Services, Inc.

DATE: June 21, 1990 10:10 a.m.

RE: Technical Review Committee Meeting
Installation Restoration Study
Naval Submarine Base - New London
Groton, Connecticut
N62472-88-C1294
Atlantic Project Number: 1256-10-90

ATTENDEES: Curt Kraemer, Atlantic Environmental Services, Inc.
Paul Burgess, Atlantic Environmental Services, Inc.
Joyce Rowley, Town of Ledyard
Paul Marchessault, USEPA
Jim Sebastian, USEPA
Eileen Neilands, NORDIV NAVFACENGCOM
Adrienne Townsel, Northern Division - Project Manager
Barbara Strother, Town of Groton
Norman Richards, City of Groton
Michael Powers, CTDEP
Paul Jameson, CTDEP
Bill Mansfield, SUBASE NLON, Environmental Engineer
Jim Fitzpatrick, SUBASE NLON
Thomas V. Wagner, Town of Waterford
Douglas Peabody, Town of Waterford
Tony Gigliotti, Town of Waterford
Perry H. Davis, R.S., City of New London

Mr. Mansfield initiated the meeting and explained that the purpose of the Technical Review Committee (TRC) was to provide technical and community input to the Installation Restoration (IR) Study program.

Mr. Mansfield explained that an Initial Assessment Study (IAS) was started in 1982 and completed in 1983. The IAS included an extensive review of files at the Naval Submarine Base - New London (SUBASE), and numerous interviews with personnel knowledgeable about past SUBASE activities (particularly disposal

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activities). A Verification Study was initiated in 1985 and concluded in 1988. This study included the collection of soil, sediment and surface water samples from the Area A Wetlands, the DPDO Area (now known as the DRMO - Defense Reutilization and Marketing Office) and the Overbank Disposal Area. The TRC was formed in 1988 to review the development of the current IR Study.

Mr. Marchessault, of the USEPA, explained that the SUBASE would be listed on the USEPA National Priorities List (NPL), also referred to as "Superfund", within a month. Mr. Marchessault gave a brief explanation of the time frame, the parties involved (USEPA, CTDEP and the Navy), and the Interagency Order that would be developed.

Mr. Burgess, of Atlantic Environmental Services, Inc., presented a brief overview of the IR Study. Mr. Burgess followed the outline in a handout which was given to all attendees of the meeting. The outline presented seven Step I sites and four Step II sites. Step I investigations determine only the presence or absence of contamination; they do not define the nature or extent of contamination, if present. Step II investigations, performed at Step I sites where contamination has been confirmed, define the nature and extent of contamination; they are very detailed and are referred to as Remedial Investigations at Superfund sites. The Step I sites are:

- CBC Drum Storage
- Rubble Fill at Bunker A-86
- Torpedo Shops
- Goss Cove Landfill
- Over-Bank Disposal Area - Northeast
- Spent Acid Storage and Disposal Area
- Former Gasoline Station

The Step II sites are:

- Area A (landfill, wetlands and downstream watercourses)
- Over-Bank Disposal Area
- DPDO Area (now referred to as the DRMO)
- Lower SUBASE

After Mr. Burgess' presentation, the meeting was opened to questions and comments (summarized below).

Question	
J. Rowley:	In light of some of the contaminants detected to date, how extensive will the radiation surveys be?
Answer	
P. Burgess:	All of the landfilled areas will have a detailed, above ground, radiation survey. Additionally, water samples from the Goss Cove (Nautilus) Area, Area A (Landfill, Wetland, and Downstream Watercourses), Overbank Disposal Area, and the DPDO Area will be analyzed for radioactive parameters.
C. Kraemer:	We will also be screening all soil samples, including those samples collected for logging the subsurface geologic conditions, with radiation monitoring equipment.

Question

P. Jameson: Due to the fact that a container of thorite was identified at the Rubble Fill at Bunker A-86, are you planning any radiation survey for this site?

Answer

P. Burgess: No radiation survey is planned. However, we will be monitoring for radiation at each site as we collect soil samples.

Question

N. Richards: Are you planning any sediment sampling in the Thames River?

Answer

C. Kraemer: Two sediment samples will be collected in the Thames River at two discharge points. The discharged waters originate from Area A. The samples will be collected just a few feet out from the discharge point.

P. Burgess: Because of the numerous industries on the Thames, we are focusing on the sediments in the surface streams on the SUBASE. If the data suggests contaminants are migrating out into the river, additional river sediment samples could be recommended.

Question

J. Rowley: What type of aquifer modeling will you be doing to look at the potential for offsite migration of contaminants?

Answer

P. Burgess: We will be developing ground water flow plans for both the overburden and bedrock aquifers. This will enable us to determine whether there may be any impact to offsite ground water users.

Question

M. Powers: What type of ability do you have to add to, or modify, the IR Study if certain types of contaminants, such as halogenated volatile organics (more dense than water - tend to sink in the aquifer), are detected?

Answer

A. Townsel: The contract between Atlantic and the Navy allows for "add-ons" with the realization that a large field program could encounter conditions that require further investigation. It is this flexibility that will allow the IR Study to proceed smoothly.

Question

N. Richards: Have any PCBs been detected on the SUBASE?

Answer

P. Burgess: None of the analyses to date have detected any PCBs. However, PCBs have been used on the SUBASE and the IR Study includes analysis for PCBs.

Question

P. Marchessault: Are you satisfied that your background investigation (IAS) is complete?

Answer

B. Mansfield: I feel very good that the files were thoroughly searched. There may be other sites that we will still learn about, however, I do not think that there is any information in the files that we have not already reviewed.

Question

P. Jameson: I do not see any mention of any off-base sites such as the Dolphin Mart. Are you planning to investigate that site?

Answer

A. Townsel: The Dolphin Mart is covered under a separate contract and is currently under investigation by another consultant.

Question

N. Richards: What type of fuels and persistent contaminants might be associated with the Torpedo Shops?

Answer

B. Mansfield: There are two waste collection systems in use at the facility. One is the sanitary, which, up to 1983, was handled by septic tanks and leachfields, and is now connected to the sanitary. The second collection system is for all the hazardous waste, which is periodically removed and properly disposed of. The main concern is for the random small spillage of wastes into the sanitary system. The primary wastes that may have entered the sanitary system are volatile organics.

Question

N. Richards: What types of batteries and associated wastes are there? Are there any NiCad (nickel-cadmium) batteries?

Answer

B. Mansfield: The only type of battery that was used are World War II vintage lead-acid batteries.

There were no additional questions regarding the "Plan of Action".

Mr. Mansfield initiated a discussion regarding the scheduling of TRC meetings. It was pointed out that some Naval Activities hold TRC meetings as frequently as once a month. Other options discussed were once every two months or at specific milestones. Mr. Powers urged that we meet at specific milestones. There was a consensus amongst the TRC that milestone meetings would be best. Mr. Mansfield indicated that the next meeting should be held after the field work was completed, sometime in the fall; no specific date was set.

Mr. Marchessault indicated that current USEPA guidelines call for the completion of the Remedial Investigation and Feasibility Study (RI/FS) within thirty (30) months after signing the Interagency Agreement. He mentioned that the current USEPA guidelines call for the FS to be conducted concurrently with the RI. Ms. Townsel responded that the existing Project Schedule does include one of the earlier FS tasks, and that the Navy is aware of the RI and FS interaction and scheduling. The FS will be scheduled once the initial set of laboratory data is received and reviewed.

Ms. Townsel asked Mr. Marchessault what the USEPA review process involves and how long it might take to receive comments on the "Plan of Action". Mr. Marchessault indicated that copies of the plan had been distributed to a variety of persons of specific technical backgrounds. He expected comments from those persons by July 4, 1990. He anticipated that the Navy would receive a summary of those comments by the following week.

The meeting was adjourned at about 11:20 AM.

Paul Burgess

Paul Burgess, P.E.
Project Manager

STATEMENT OF

NORMAN RICHARDS, Ph.D.

ENVIRONMENTAL ADVISOR

CITY OF GROTON

GROTON, CONNECTICUT 06340

IN RE.

PUBLIC MEETING

INSTALLATION RESTORATION PROGRAM PLAN
NAVAL SUBMARINE BASE, NEW LONDON
GROTON, CONNECTICUT

26 JULY 1990
SHEPHERD OF THE SEA CHAPEL
GROTON, CONNECTICUT

Many of the assessment principles outlined in the 3 April letter are also applicable to river assessment near the superfund site. I also recommend the following technical consideration should be a part of the study:

(1) A minimal program should include fulfillment of all superfund risk assessment guidance for estuaries, sediments and biota that has been developed by the U.S. Environmental Protection Agency.

(2) Benthic biota should be assessed for diversity, abundance, pollution-tolerant indicator species, and analytes.

(3) In addition to standard analysis of currents, water column structure and pollutant loading, the Navy should consider various anthropogenic effects, e.g., propeller wash on chemical fate.

(4) Analysis of groundwater movement to the estuary should include gap width analysis.

(5) Computer models that are appropriate for assessment of estuarine structure and function should be used.

(6) Metal sulfides should be analyzed and the data assessed.

(7) EPA and the Navy should reassess the conclusion that significant wetlands do not exist within two miles of the site: Mamacoke Hill - associated wetlands are in that radius and have extremely high value.

Thank you again for the opportunity to comment on the proposed project. I hope these suggestions will be helpful.

Comm.
Comm. of whole

JUL 10 1990

CITY CLERK'S OFFICE
GROTON, CT 06340

July 10, 1990

TO: Catherine Kolnaski, Mayor

FROM: Norman Richards, Environmental Advisor

SUBJECT: **Summary of Meeting: June 21, 1990 Naval Submarine Base Technical Review Committee**

MEETING:

I attended the subject meeting at your request: a list of participants (Attachment A), a map of study sites (Attachment B), a description of those sites (Attachment C), and a newspaper article on the designation of the US Submarine Base as a superfund site (Attachment D) are enclosed for your review.

OBSERVATIONS:

The Technical Review Committee (TRC) included Deb Jones (now on maternity leave), Town of Groton, as a member. It has been meeting--but without representation from the City of Groton and many other potentially affected neighboring municipalities. The final plan of action for the "Installation Restoration Study" (Navy Contract No. N 62472-88-C-1294) is dated April 1989 and was apparently reviewed by the TAC.

The purpose of the expanded TRC is to provide a vehicle for periodically updating the nearby community on progress on the Installation Restoration Study as it proceeds through the site inspection and remedial investigation/feasibility study phases. Future meetings will be called only as specific project milestones are accomplished.

It is obvious that the superfund site will receive national media coverage as the study progresses. Widespread historic chemical contamination of the site includes many toxic chemicals: thorium, DDT and its metabolites, PCBs hydrocarbons and their combustion products, metals, acids, ash, and others.

Wetlands and the Thames River could be contaminated from streams, runoff, groundwater, and direct contact with pollutants. Based on information provided at the meeting, I am concerned that the planned work will provide inadequate information to adequately assess the risk to wetlands or the Thames River Estuary. Furthermore, an adequate health risk assessment would probably also require additional preliminary study. The subsequent "Preliminary Development of Alternatives" will be based on the data base developed from the ongoing study.

RECOMMENDATIONS:

The Environmental Advisor should confirm the impression that:

- No assessment of nearsite Thames River sediments or their associated biota are planned.
- No studies of the emergence of groundwater flow in the river are planned
- A health risk assessment, if planned, will be based on the limited sampling and analysis discussed at the 21 June TRC meeting.
- Wetland vertebrate studies will be limited to blackbird tissue analysis.

Following the above proposed review, the Mayor could direct the Environmental Advisor to either:

- Discontinue analysis of the problem
- Report to the Council for City action
- Make broad recommendations through the TAC.

Whatever your decision is on this matter, I believe that the design of a detailed health and risk assessment study plan by the Navy is their responsibility. The Environmental Advisor should not and can not serve as a consultant to the Navy on this project by scoping out revised work plans. However, the Navy should be made aware of our concerns ASAP.

NR/kc

CC: Councilor Dunbar
Councilor Dickey
Councilor Collins
Councilor McDermott
Councilor Frankopoulos
Councilor Shultis

MEMORANDUM

TO: FILE

FROM: PAUL BURGESS

DATE:

RE: PUBLIC MEETING JULY 26, 1990

PROJECT NO. 1256-10

A public meeting was held on this date at the Navy Chapel. About 30 people attended including the following project people
- P. Burgess, C. Kraemer - ATLANTIC
- B. Mansfield, T. Fitzpatrick, P.W. Commanding Officer
- J. Ward, Adrienne Townsell, Eileen - Navy
- Dave Marschaeuldt & James Sebastian USEPA

P.W. Commanding Officer gave overview of program.

P. Burgess gave slide presentation of sites and field investigation program.

A panel of P. Burgess, W. Mansfield, A. Townsell, and Paul Marschaeldt address the questions attached.

The ~~meeting~~ meeting was video recorded.

PUBLIC MEETING QUESTIONS
JULY 26, 1990

1. Robert Frommer - Environmental Action Fund, Inc.

   Q. I would like to sit on the TRC. Can the public sit on this committee? I would like a copy of the Work Plan.

   A. Bill Mansfield - I will let you see the document. Any community member with the appropriate background is welcome to site on the TRC.

2. Sue Puzzoulo, resident

   Q. What assurances do we have that the sampling process will not affect the environment?

   A. Paul Burgess - Soil and water will be drummed. (De?) Contamination fluids are is controlled and drummed.

   Q. Where is the blasting site on the SUBASE and will that construction affect Area A? Has a hydrogeologic study been done??

   A. PW Construction officer answered question -

3. Dr. Joffey, Crystal Spgs. Laboratory - Wants to be on TRC.

4. Groton City Health Department

   Q. How many physicians on TRC?

   A. Re: cancer risks

   Q. What does the Navy presently do with "toxic" landfill?

   A. Offsite

   Q. What do you do with a large area of soil contamination, like the lower base? Possible soil venting, pump and treat.

5. ??

   Q. Any plans for the Navy to use EB's incinerator? WOM - No

   Q. What is the depth to water estimate on base? PB - 2-10'

   Q. Any indication of radioactive waste on base? PB - No

   Q. What was the Navy thinking when they put the museum over the Goss Cove Landfill? Did they know when they built it? Mansfield - was not fully considered at time

Q. Was there any surface or ground water drainage into Groton reservoir? WM - No.

6. Mr. Wm. Kelsey (?), Thames River Watershed Association

Q. Will any sediment samples be taken downstream of SUBASE or will there be any fish sampling? PB - SW + SD at outlet of discharge streams

Q. What about the Crystal Lake Tank Farm facility - should it be part of this investigation? WM - under another study

Q. Shouldn't known sources of leachate be covered under NPDES? Mechanicut USEPA - No.

Q. Do we anticipate capping of the site or are we going to remediate the pollutants? PB

A. Paul Burgess - will be evaluated in FS study.

Q. Are we going to do any toxicity testing on sediment areas? PB - No

7. Resident

Q. Are tank farms included in the study? WM - No.

8. Resident?

Q. Why was the Thames dredged?

Q. When the cleanup starts, what will happen to the airborne contaminants?

Q. Streams - are they manmade or natural?

Q. Do streams intersect North Lake?

Q. How can you be sure that the water in the lake is safe if the sampling program has not begun?

9. Haas, nearby resident, Planning Director - Ledyard

Q. Request for additional copies of Plan of Action

Q. Area A - OBDA - How were the well locations selected?

10. Nearby resident

Q. Do they do chemical testing on a regular basis?

Q. Do they test sediments regularly as well? Why not?

Q. In which part of the report will health risks be assessed?

Q. What are the standards used to determine if it is hazardous or not?

Q. When will the sites make the Superfund (NPL) list, and will it make a difference in the Plan of Action as written?

Q. How does the priority system work?

11. Pine Lock resident

Q. Who pays for this? EPA doesn't pay for cleanup on Navy Bases.

12. Robert Frommer - Environmental Action Fund, Inc.

Q. How can we locate downgradient sampling locations if we don't know the direction of ground water flow?

Q. Will we develop a 3-D map of flow net?

Q. Are there storm sewer systems being investigated? Are we doing monitoring in sanitary sewers for leakage from storm sewers?

13. Nearby resident

Q. I was here when dredging was done - dredging spoils were noxious. I'm worried that Area A is not being studied enough.

14.(9.) Haas, nearby resident, Planning Director - Ledyard

Q. How long has Navy base been receiving water from Groton Reservoir?

Q. If they cap the site, how long will it last?

15.(10.) Pine Lock resident

Q. I use well water - what about contamination leaching offbase to the east?

16(13.)

What statistical analysis was used to locate monitoring wells?

17.(5.)

Q. Suggest checked sediment traps in storm drains.

18(4.) Groton City Health Department

Q. If dredging is to take place, will it stir up PCBs in harbor or river?

19(9.) Haas, nearby resident, Planning Director - Ledyard

Q. Is there some way to collect reports of health effects from residents?

20 (1.) Robert Frommer - Environmental Action Fund, Inc.

Q. What chemical constituents will be listed?

21 (2.) Sue Puzzoulo, resident

Q. What do the onsite testing instruments detect?

Q. Will it differentiate between compounds?

Q. How can the public be assured that they will be able to see the final report?

Q. Who can they send questions or comments to?

22 (??)

Q. What was the impetus for this investigation?

23 (4.) Groton City Health Department

Q. What are the disadvantages? Has the EPA seen a site like this before?

24 (13.)

Q. Is there an active program on base to educate the Navy personnel environmentally?

25 (1.) Robert Frommer - Environmental Action Fund, Inc.

Q. What is the SUBASE doing for waste minimization?

26 (13.)

Q. Was Atlantic the lowest bidder? How was Atlantic selected? How many firms bid?

Dr. Richards - Environmental Advisor - City of Groton

- Navy should re-evaluate program
- Emphasize - chemicals in sediments in Thames and of biota in river

<u>Technical</u>

1. Include all Superfund Risk Assessment
2. Benthic biota
3. Currents - analyze anthropogenic effects on river
4. ?

5. Modeling

6. Metal sulfides

7. Re-assess value of wetland within two miles of site

- North Lake
- Elizabeth Aere? - health risks to people at site
- Haas - Bedrock wells along perimeter of Area A landfill
  - Bedrock geology
- Puzzoulo - clean drinking water

TECHNICAL REVIEW COMMITTEE MEETING

JUNE 21, 1990

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

ATLANTIC
ENVIRONMENTAL SERVICES, INC. 188 NORWICH AVENUE COLCHESTER, CONNECTICUT 06415 (203) 537-0751

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

OVERVIEW

CBC DRUM STORAGE AREA

Site Background

- The Initial Assessment Report (IAS) identified twenty-six 55 gallon drums of waste oil, lube oil and paint materials
- Drums have been removed from site by Navy

Investigation Program

- Three surface soil locations (seven soil samples)

RUBBLE FILL AT BUNKER A-86

Site Background

- IAS report identified concrete, asphalt, an electric motor, tar bucket, wood and gravel
- Atlantic identified similar items

Investigation Program

- Two surface soil locations (five soil samples)

TORPEDO SHOPS

Site Background

- Various fuels, solvents and petroleum products have been used in Buildings 325 and 450
- Building 325 used septic tank/leachfield until 1983
- Building 450 built with waste collection system
- Building 450 used septic tank/leachfield until 1983

Investigation Program

- Nine soil borings, three completed as monitoring wells
- Nine subsurface soil samples
- Three ground water samples
- One surface water sample
- One sediment sample

GOSS COVE LANDFILL

Site Background

- Landfilled between 1946 and 1957
- Landfilled materials reported to be incinerator ash and inert rubble
- Several gas cylinders removed during construction of utility trench

Investigation Program

- Geophysical, radiation and soil gas surveys
- Seven test borings, four completed as monitoring wells
- Seven subsurface soil samples
- Four ground water samples
- One surface water sample

OVER BANK DISPOSAL AREA NORTHEAST (OBDANE)

Site Background

- Several empty fiber drums of unknown contents

Investigation Program

- Two surface soil sample locations (five soil samples)

SPENT ACID STORAGE AND DISPOSAL AREA

Site Background

- Rubber coated tank used to store spent battery acids

Investigation Program

- One sample of tank bottom sediment
- Three test borings, seven soil samples

FORMER GASOLINE STATION

Site Background

- Operated from 1940 to early 1960s
- 1950 plan shows:
  - two 8,000 gallon fuel tanks
  - one 10,000 gallon fuel tank
  - one 250 waste oil tank
- Not known if tanks and associated piping were removed

Investigation Program

- Geophysical and soil gas surveys
- Five soil borings
- Five subsurface soil samples

AREA A LANDFILL

Site Background (Landfill)

- Operated before 1957 until 1973
- Materials disposed prior to 1963 were incinerated
- Material after 1963 were unburned
- Steel drums, transformers and electric switches on concrete pad noted in IAS report, some leaking

Investigation Program (Landfill)

- Geophysical, radiation and soil gas surveys
- Two surface soil samples just off concrete pad
- Fourteen soil borings, seven completed as paired monitoring wells (overburden and bedrock wells)
- Twelve soil samples will be collected from seven of the borings
- Fourteen ground water samples

Site Background (Wetland)

- Brickets of pesticides placed on frozen wetland for mosquito control
- Area received dredge spoil from Thames River
- Pesticides, Base/Neutral and metal compounds detected in wetland surface water and sediment

Investigation Program

- Nine sediment samples
- Two surface water samples
- Eight soil borings in wetland, five soil samples each
- Biological survey and investigation
- Five paired monitoring well locations (outside of wetland) and one shallow monitoring well (in wetland)
- One soil sample from each of the five shallow monitoring wells (outside of wetland)
- Eleven ground water samples

Site Background (Downstream Watercourses)

- Pesticides, Base/Neutrals, and metals compounds detected in watercourses and sediment downstream of Area A Landfill and wetland
- Streams discharge to Thames River

Investigation Program

- Twelve surface water and sediment sampling locations
- Four paired monitoring well locations, one soil sample from each boring
- Eight ground water samples
- Mussel cages in the Thames River (optional)

OVER BANK DISPOSAL AREA

Site Background

- Wood and metal debris
- Thirty partially covered 200 gallon metal fuel tanks (empty)
- Several empty 55 gallon drums

Investigation Program

- Five sediment sampling locations, ten sediment samples
- One paired monitoring well location, one soil sample from the boring
- Two ground water samples

DPDO AREA

Site Background

- Operated as a landfill between 1950 and 1969
- Disposed material consisted primarily of incinerated inert materials and non-salvageable wastes
- Battery storage and acid tank
- Solvents, metals, and Base/Neutral compounds detected in subsurface soils

Investigation Program

- Geophysical, radiation and soil gas surveys
- Two composite surface soil samples from unpaved area on north end of site
- Two grab surface soil samples near battery storage area
- Twelve soil borings, five completed as monitoring wells (one as a pair)
- Two soil samples from each boring
- Six ground water samples
- One surface water sample

LOWER SUBASE

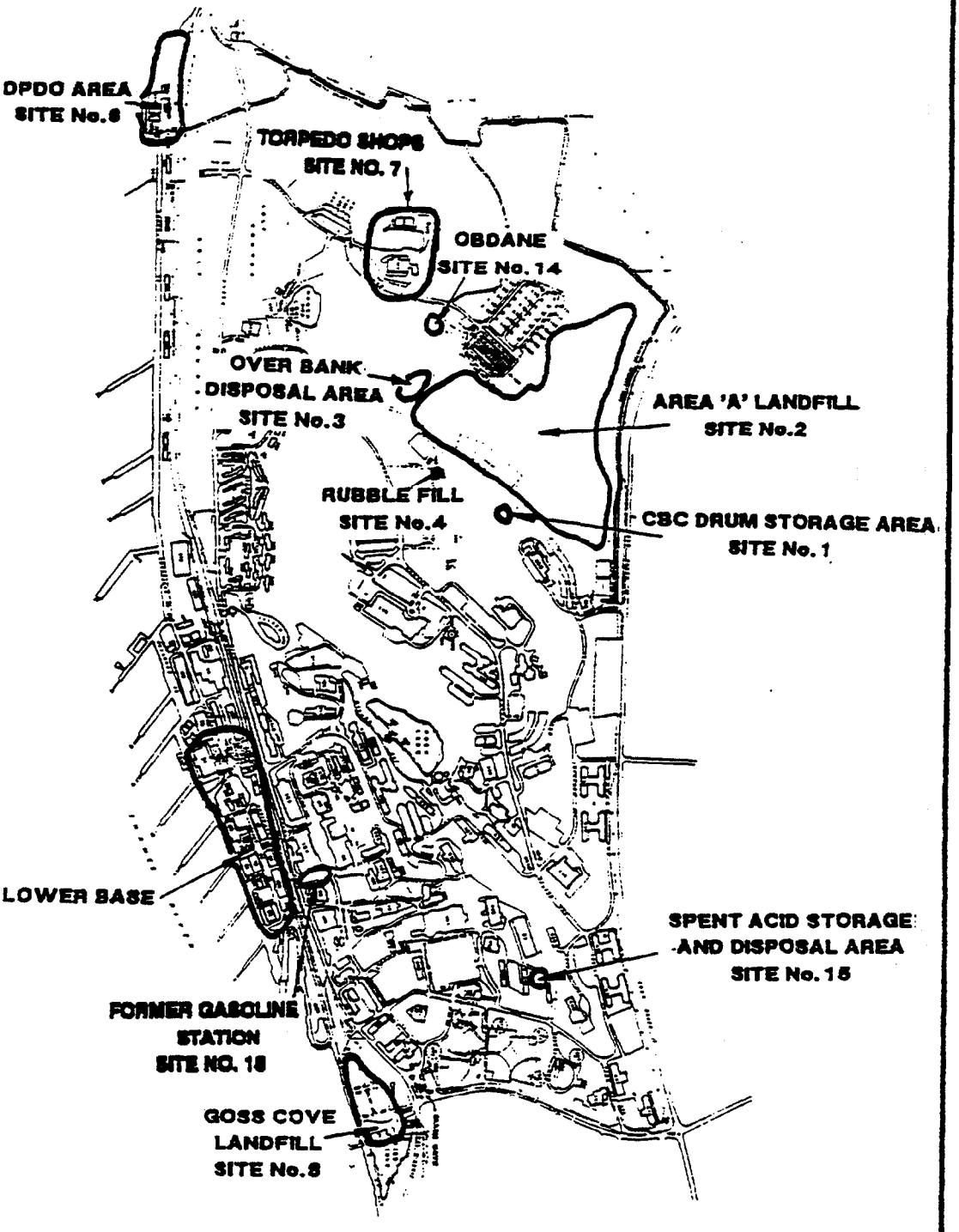
Site Background

- Four areas of potential petroleum contamination
- Petroleum contamination documented from past studies

Investigation Program

- Soil gas survey
- Optional geophysical survey
- Inspect #6 fuel line utility trench
- Reinspect and videotape all utility manholes
- Visual inspection of bulkhead along waterfront
- Test pit around manhole(s) with observed petroleum contamination
- Drill up to ten test borings in area of soil contamination at Building 79 to define extent of contamination and assist in defining source
- Eight test borings, completed as monitoring wells, near Building 107 and power plant tanks - one soil sample from each boring
- Eight test borings, completed as monitoring wells, along Albacore Road, Argonaut Road, and around Building 79 - one soil sample from each boring
- Three test borings, completed as monitoring wells, in sand manholes extending below relieving platform - one soil sample from each boring
- Conduct 48 hour continuous monitoring of ground water and river levels
- Conduct 48 hour, minimum, pump test in vicinity of thickest product
- Collect 25 ground water samples from new and existing wells

SAMPLE LOCATION PLANS



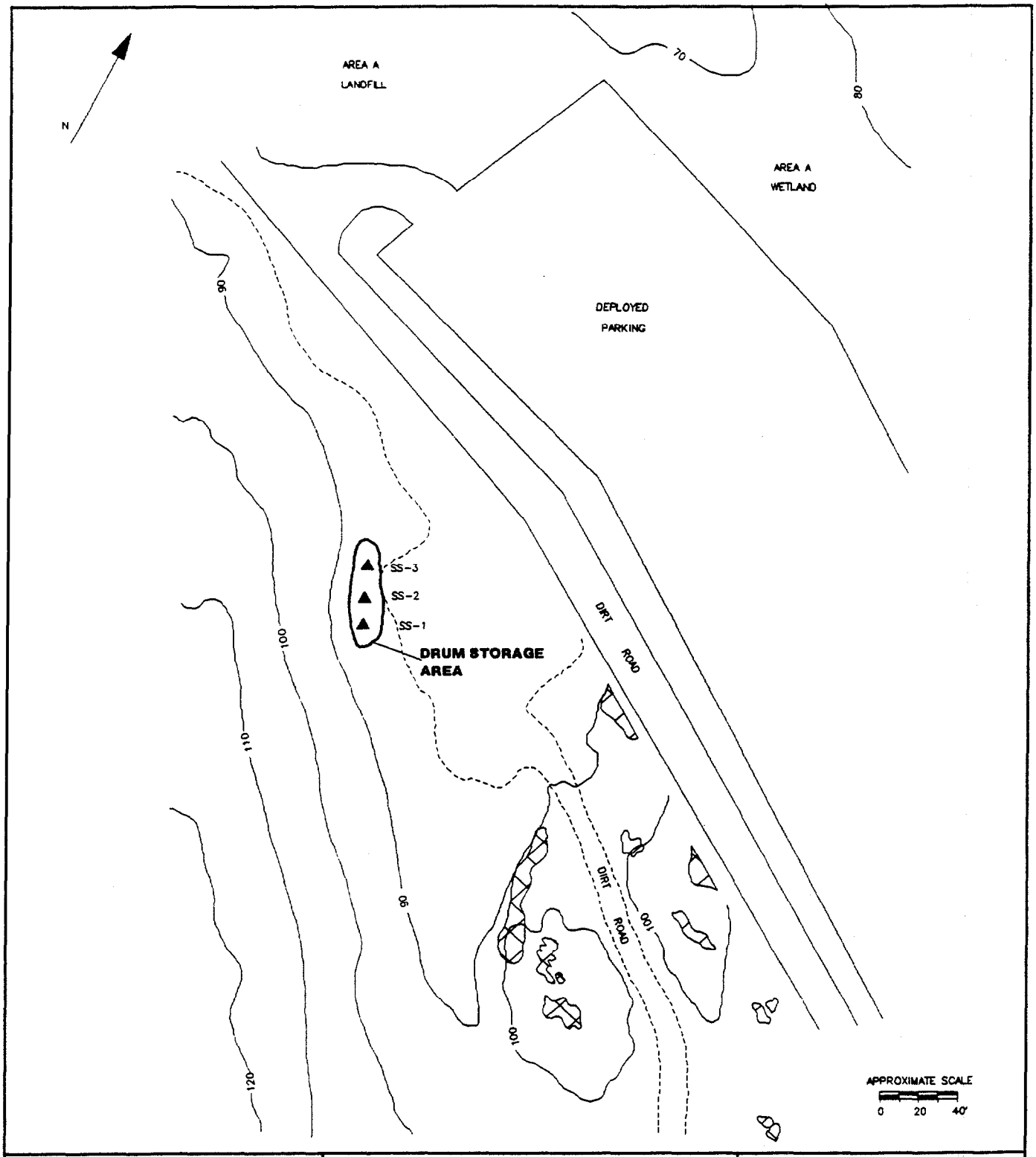
INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE
NEW LONDON
GROTON, CT

Source:
Naval Submarine Base
Existing Conditions
April 1985
Loureiro Engineering Associates

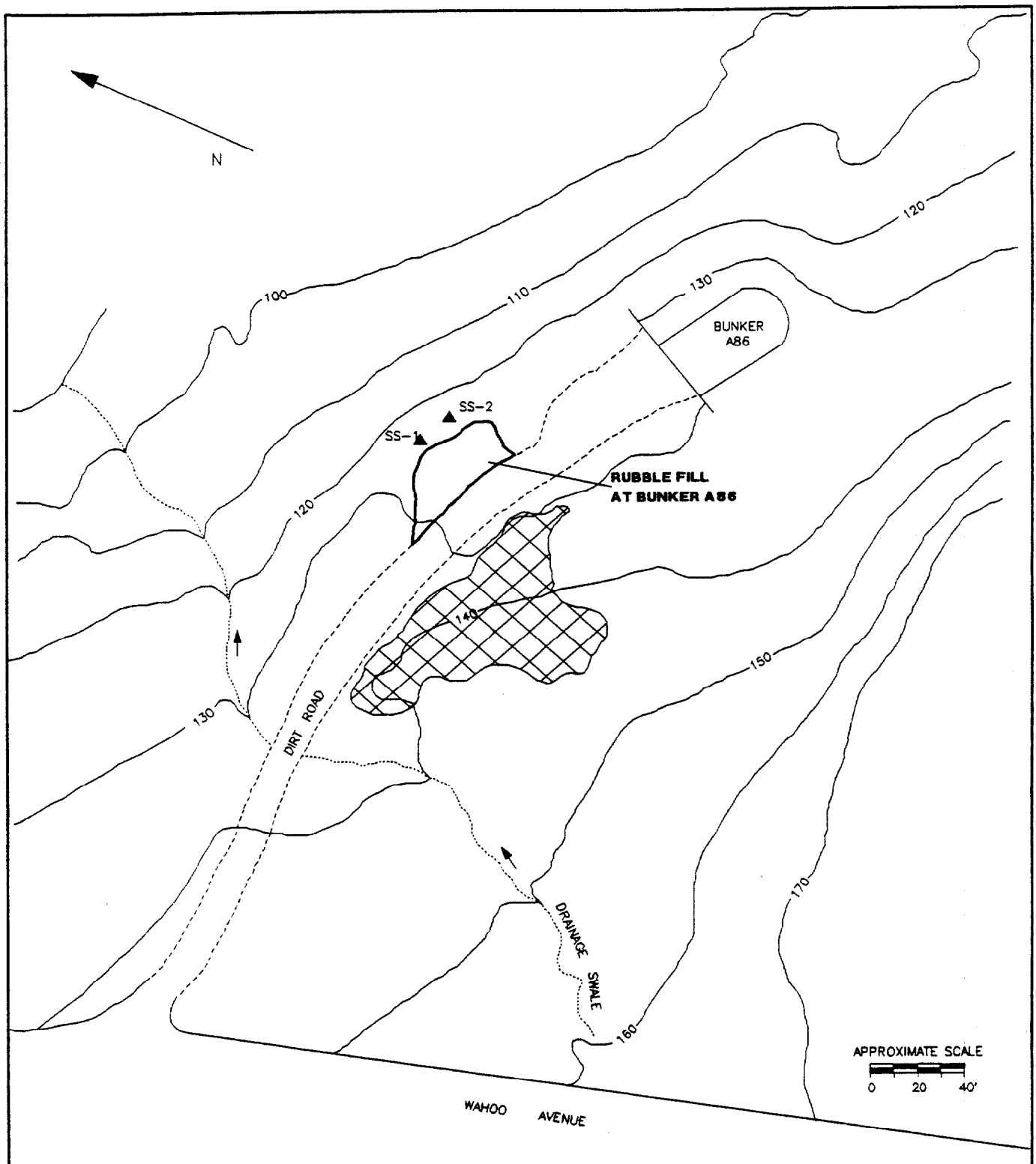
N

FIGURE 1-3
INSTALLATION RESTORATION
STUDY SITES

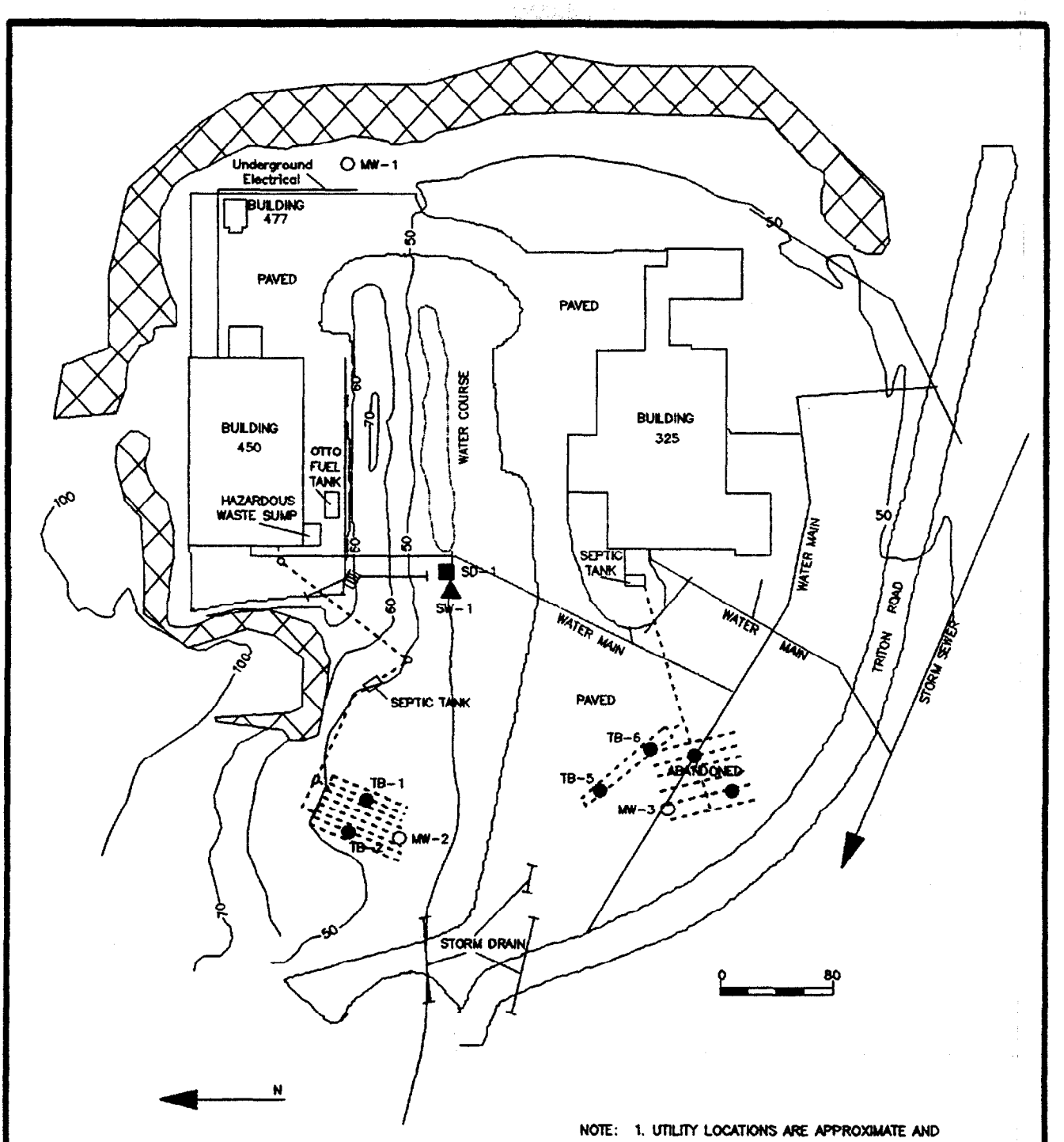
ATLANTIC ENVIRONMENTAL SERVICES, INC.



INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE NEW LONDON GROTON, CT	LEGEND		FIGURE 4-2 FIELD SAMPLING PLAN CBC DRUM STORAGE AREA
	PROPOSED	EXISTING	
	▲ SS-1 – Surface Soil Sample	—95— Existing Grade Exposed Bedrock	
			ATLANTIC ENVIRONMENTAL SERVICES, INC.



INSTALLATION RESTORATION STUDY **NAVAL SUBMARINE BASE** **NEW LONDON** **GROTON, CT**	**LEGEND** **PROPOSED**: ▲ SS-1 – Surface Soil Sample **EXISTING**: —95— Existing Grade; Exposed Bedrock	**FIGURE 4-3** **FIELD SAMPLING PLAN** **RUBBLE FILL AT BUNKER A86** ATLANTIC ENVIRONMENTAL SERVICES, INC.



NOTE: 1. UTILITY LOCATIONS ARE APPROXIMATE AND MUST BE VERIFIED.
2. FORMER SERVICE STATION LOCATION SUPERIMPOSED ONTO FIGURE FROM ORIGINAL CONSTRUCTION PLANS.

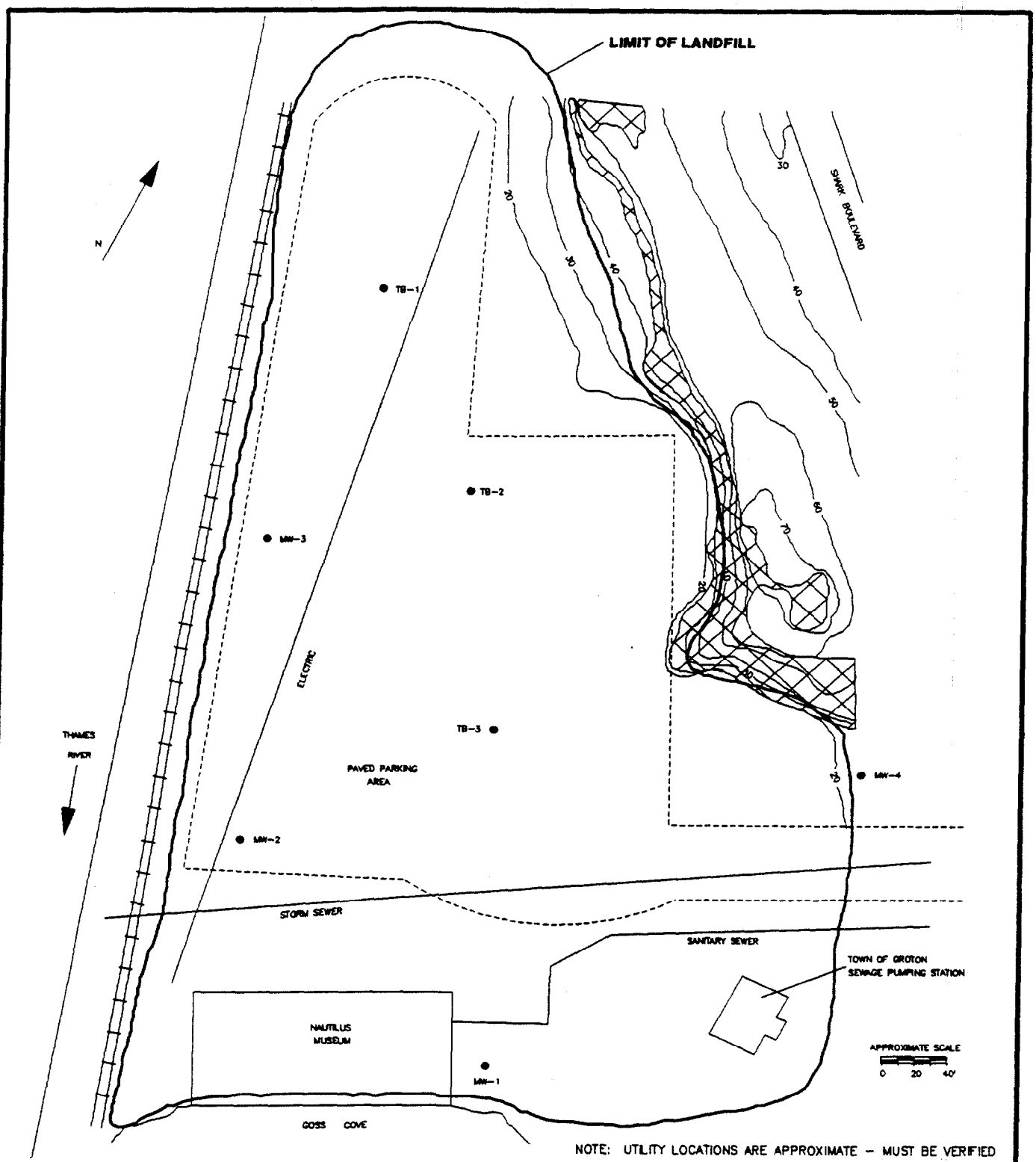
INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE
NEW LONDON
GROTON, CT

LEGEND

PROPOSED	EXISTING
▲ SD-1 Sediment Sample	—95— Existing Grade
■ SW-1 Surface Water Sample	Exposed Bedrock Face
● TB-1 Test Boring	----- Former Septic System
○ MW-1 Monitoring Well	

FIGURE 4-4
FIELD SAMPLING PLAN
TORPEDO SHOPS

ATLANTIC ENVIRONMENTAL SERVICES, INC.



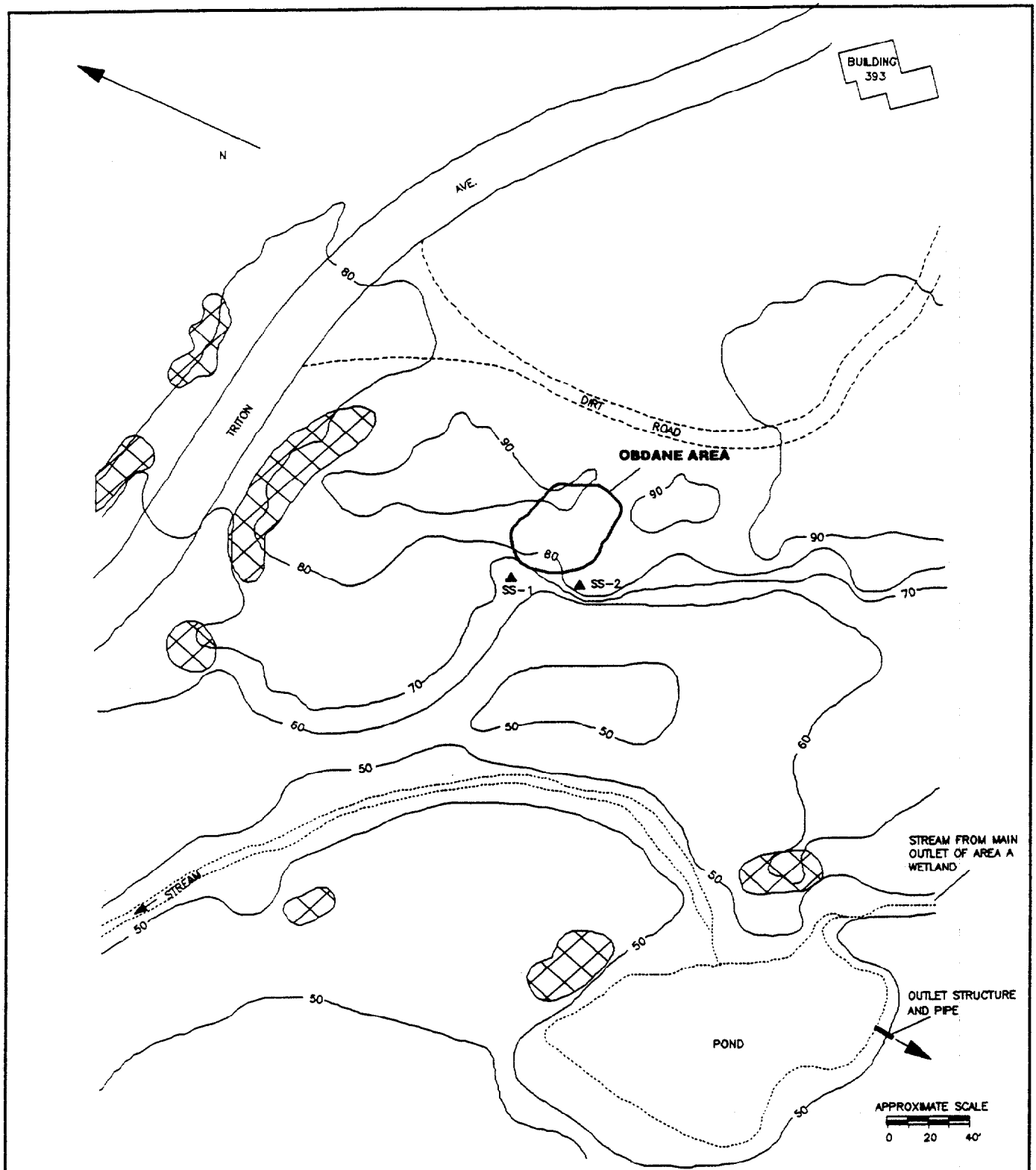
INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE
NEW LONDON
GROTON, CT

LEGEND

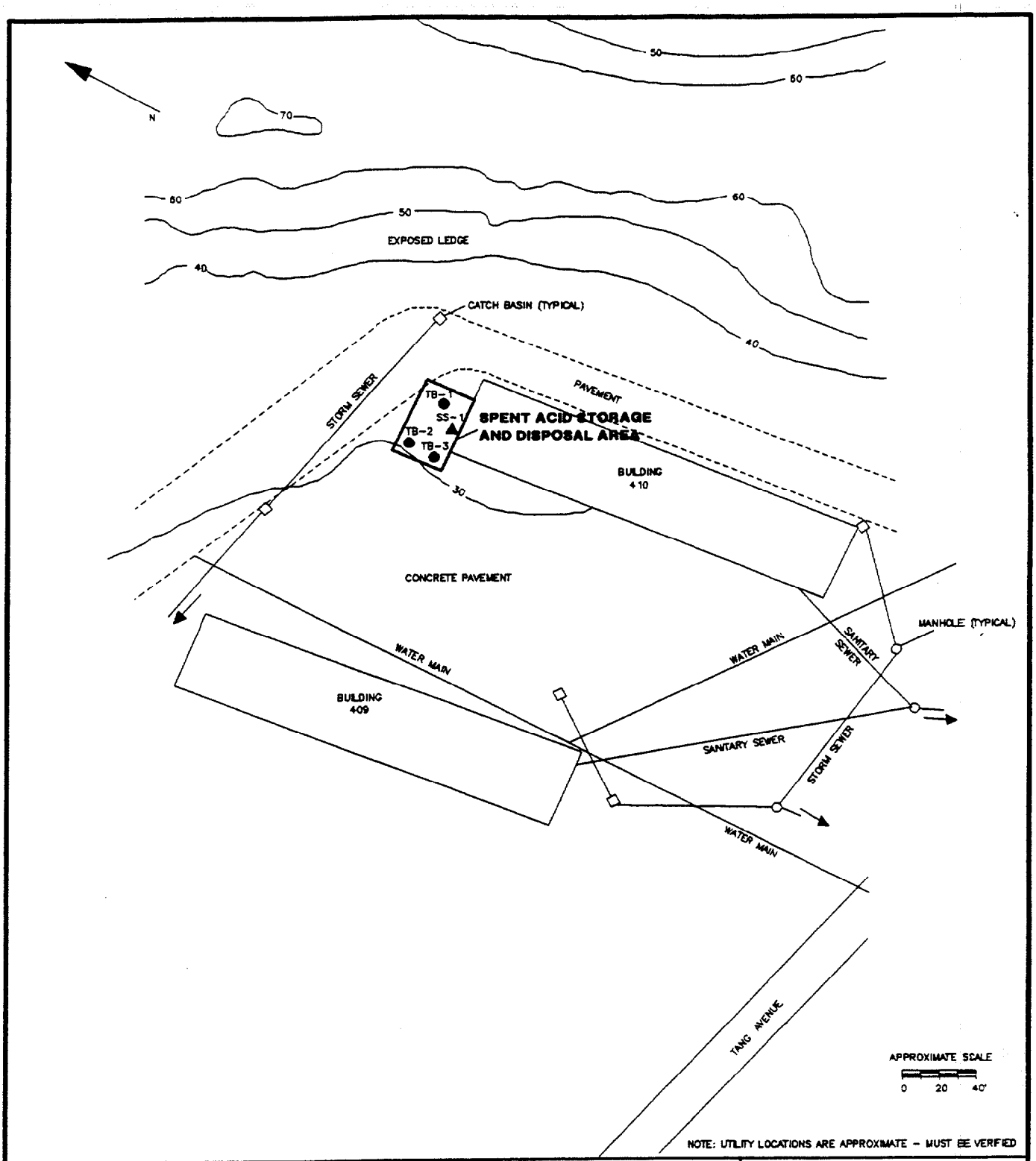
PROPOSED	EXISTING
● TB-1 – Test Boring	—95— Existing Grade
● MW-1 – Monitoring Well	Exposed Bedrock
	○ TB-1 – Test Boring

FIGURE 4-5
FIELD SAMPLING PLAN
GOSS COVE LANDFILL

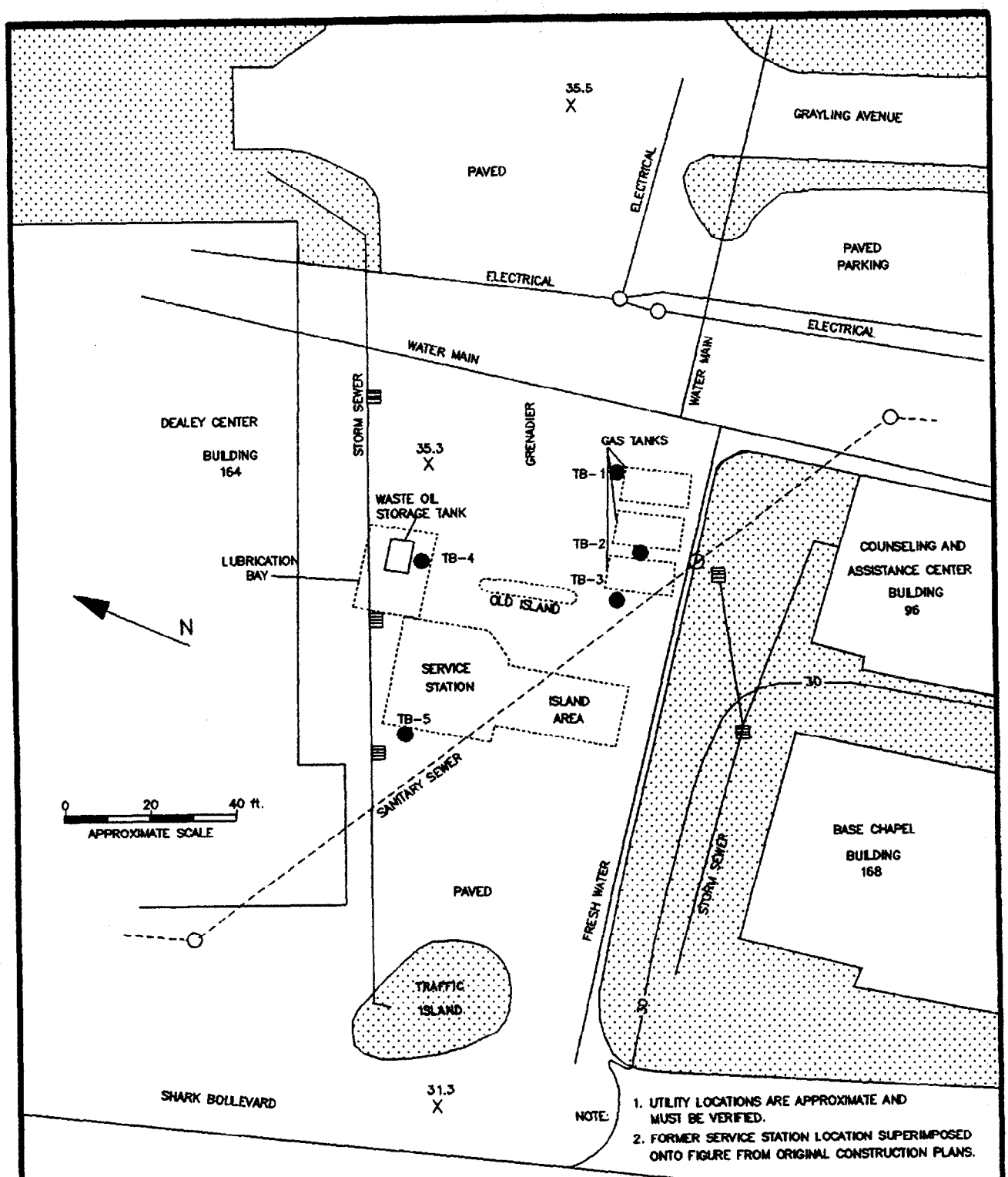
ATLANTIC ENVIRONMENTAL SERVICES, INC.



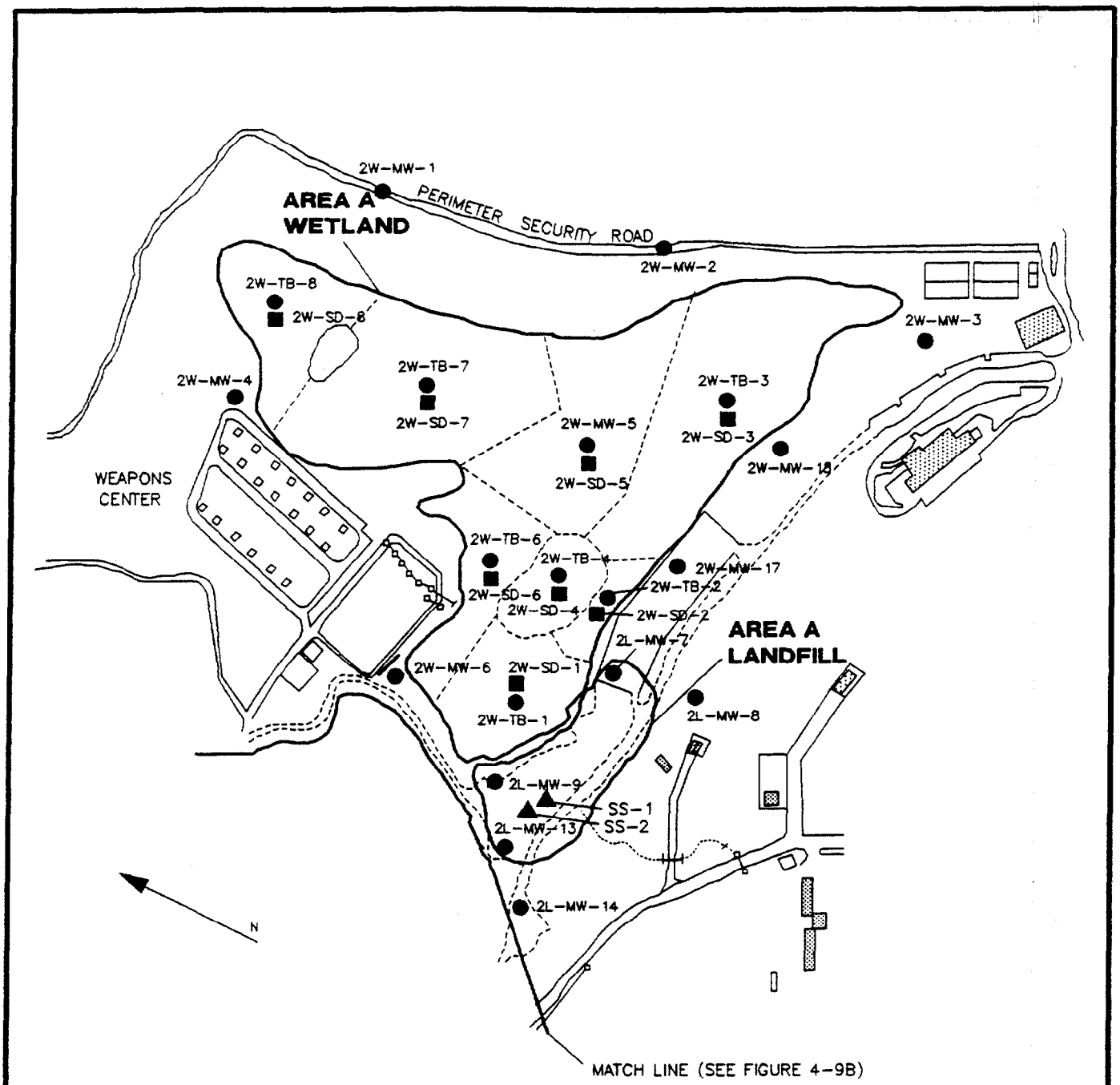
INSTALLATION RESTORATION STUDY **NAVAL SUBMARINE BASE** **NEW LONDON** **GROTON, CT**	**LEGEND** **PROPOSED**: ▲ SS-1 – Surface Soil Sample **EXISTING**: —95— Existing Grade; Exposed Bedrock; ---------- Stream	**FIGURE 4-6** **FIELD SAMPLING PLAN** **OBDANE AREA** ATLANTIC ENVIRONMENTAL SERVICES, INC.



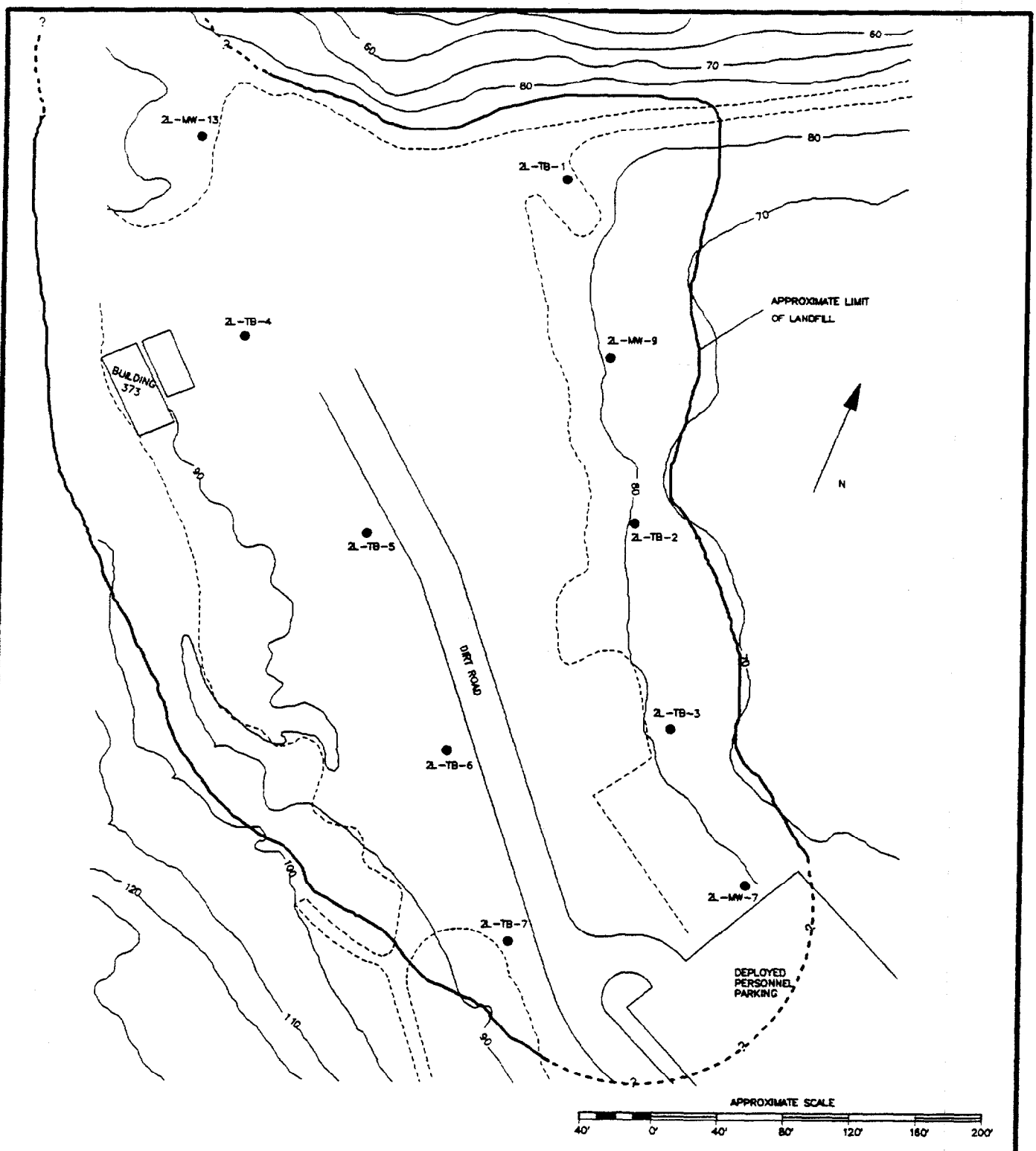
INSTALLATION RESTORATION STUDY **NAVAL SUBMARINE BASE** **NEW LONDON** **GROTON, CT**	**LEGEND** **PROPOSED**: ● TB-1 – Test Boring; ▲ SS-1 – Surface Soil Sample **EXISTING**: —95— Existing Grade	**FIGURE 4-7** **FIELD SAMPLING PLAN** **SPENT ACID STORAGE AND DISPOSAL** ATLANTIC ENVIRONMENTAL SERVICES, INC.



INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE NEW LONDON GROTON, CT	LEGEND PROPOSED: ● TB-1 – Test Boring EXISTING: ----- Former Structure; —95— Existing Grade; Sidewalk/Island; 78.2 X Spot Grade	FIGURE 4-8 FIELD SAMPLING PLAN FORMER GASOLINE STATION ATLANTIC ENVIRONMENTAL SERVICES, INC.

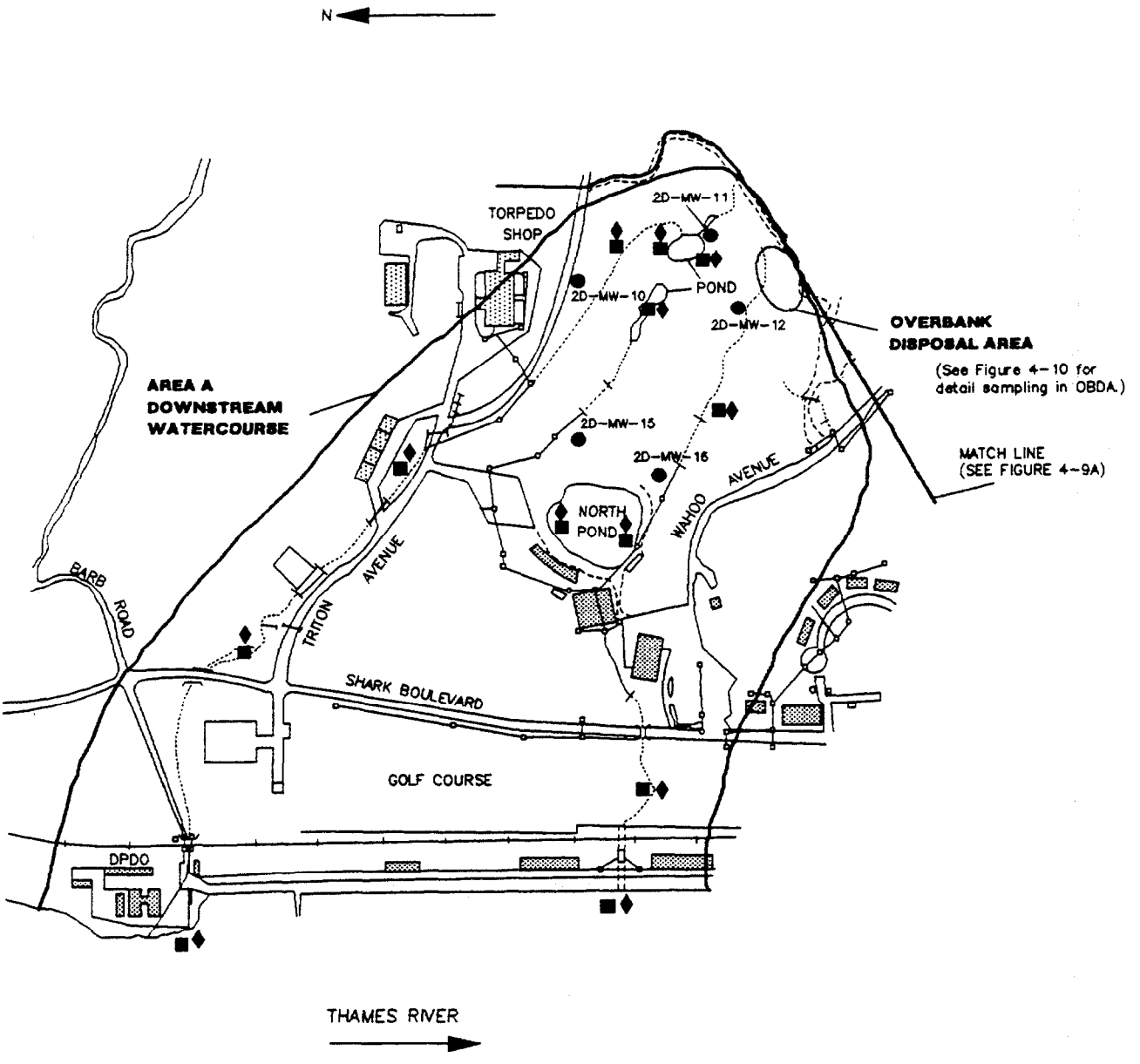


INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE NEW LONDON GROTON, CT	LEGEND		FIGURE 4-9A FIELD SAMPLING PLAN AREA A LANDFILL AND WETLAND
	PROPOSED	EXISTING	
	● TB-1 – Test Boring Sample ● MW-1 – Monitoring Well ■ SD-1 – Sediment Sample ▲ SS-1 – Surface Soil Sample	▩ Building	ATLANTIC ENVIRONMENTAL SERVICE, INC.

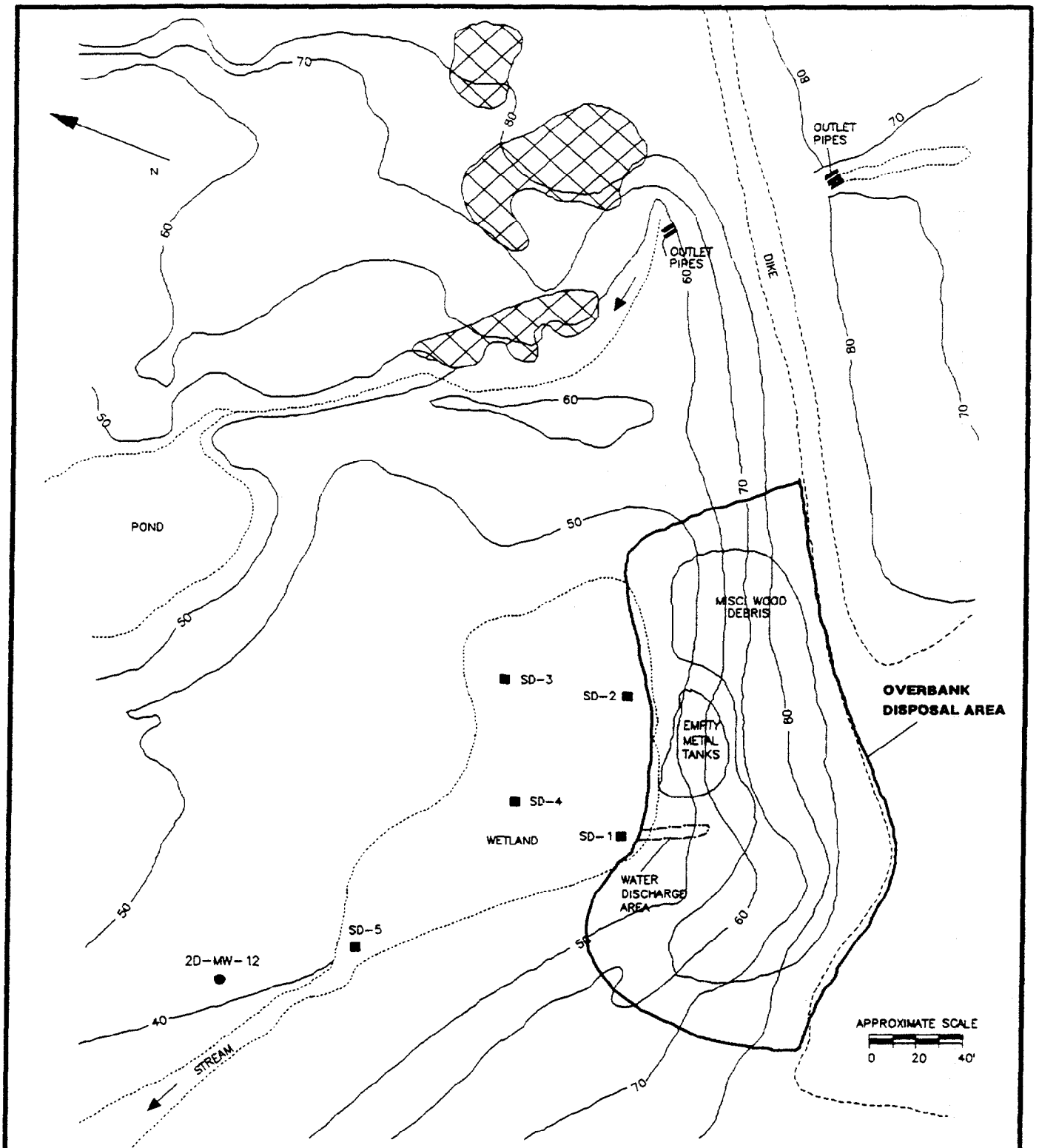


INSTALLATION RESTORATION STUDY **NAVAL SUBMARINE BASE** **NEW LONDON** **GROTON, CT**	**LEGEND** **PROPOSED**: ● TB-1 – Test Boring; ● MW-1 – Monitoring Well **EXISTING**: — 95 — Existing Grade	**FIGURE 4-9B** **FIELD SAMPLING PLAN** **AREA A LANDFILL** **BORING LOCATIONS** ATLANTIC ENVIRONMENTAL SERVICES, INC.

ATLANTIC



INSTALLATION RESTORATION STUDY **NAVAL SUBMARINE BASE** **NEW LONDON** **GROTON, CT**	**LEGEND** **PROPOSED**: ● MW-1 – Monitoring Well; ■ SD-1 – Sediment Sample; ♦ SW-1 – Surface Water Sample **EXISTING**	**FIGURE 4-9C** **FIELD SAMPLING PLAN** **AREA A** **DOWNSTREAM WATERCOURSE** ATLANTIC ENVIRONMENTAL SERVICE, INC.



INSTALLATION RESTORATION STUDY **NAVAL SUBMARINE BASE** **NEW LONDON** **GROTON, CT**	**LEGEND** **PROPOSED**: ■ SD-1 – Sediment Sample; ● MW-12 – Monitoring Well **EXISTING**: —95— Existing Grade; Exposed Bedrock; ····· Stream	**FIGURE 4-10** **FIELD SAMPLING PLAN** **OVERBANK DISPOSAL AREA** ATLANTIC ENVIRONMENTAL SERVICES, INC.

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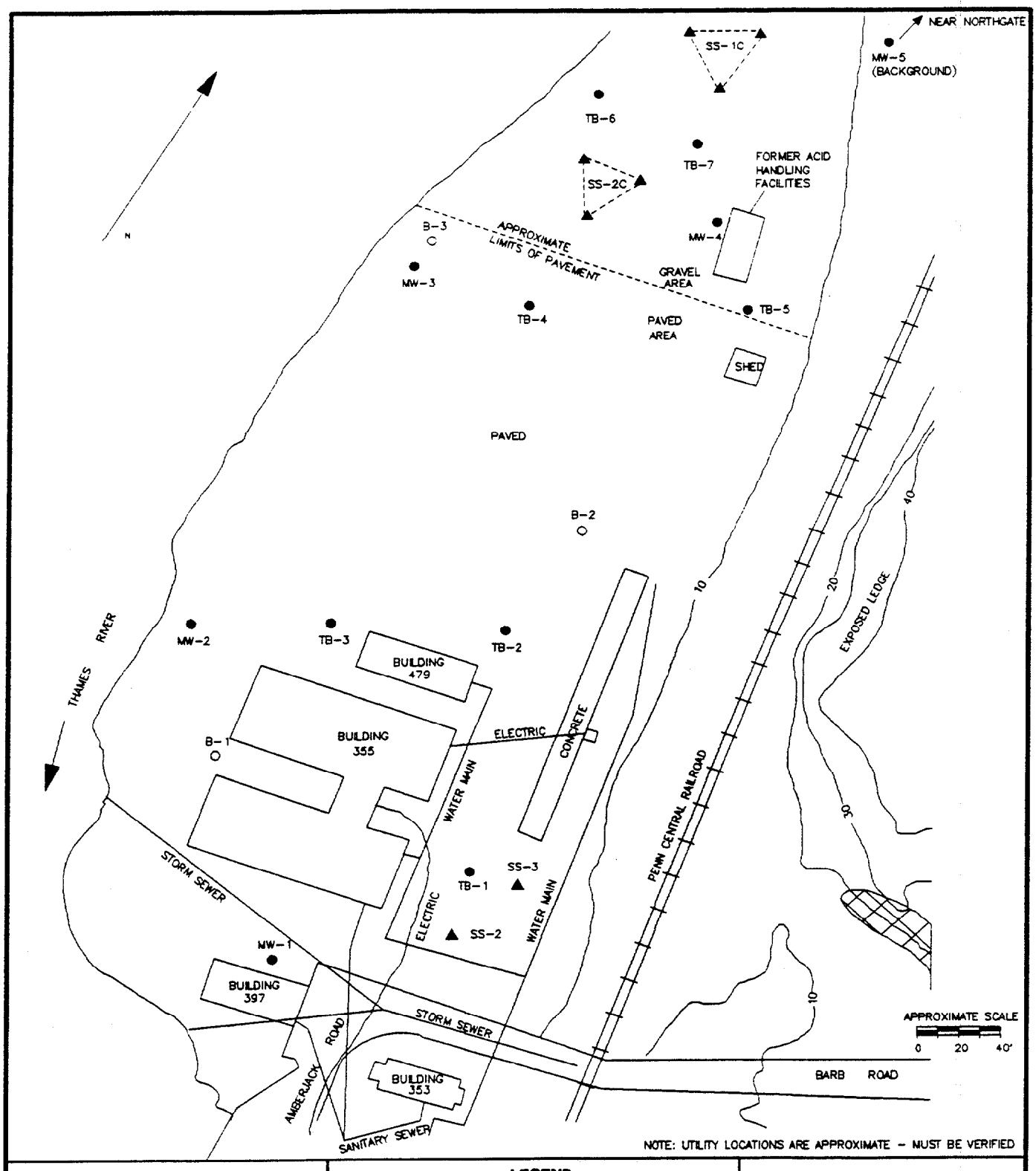


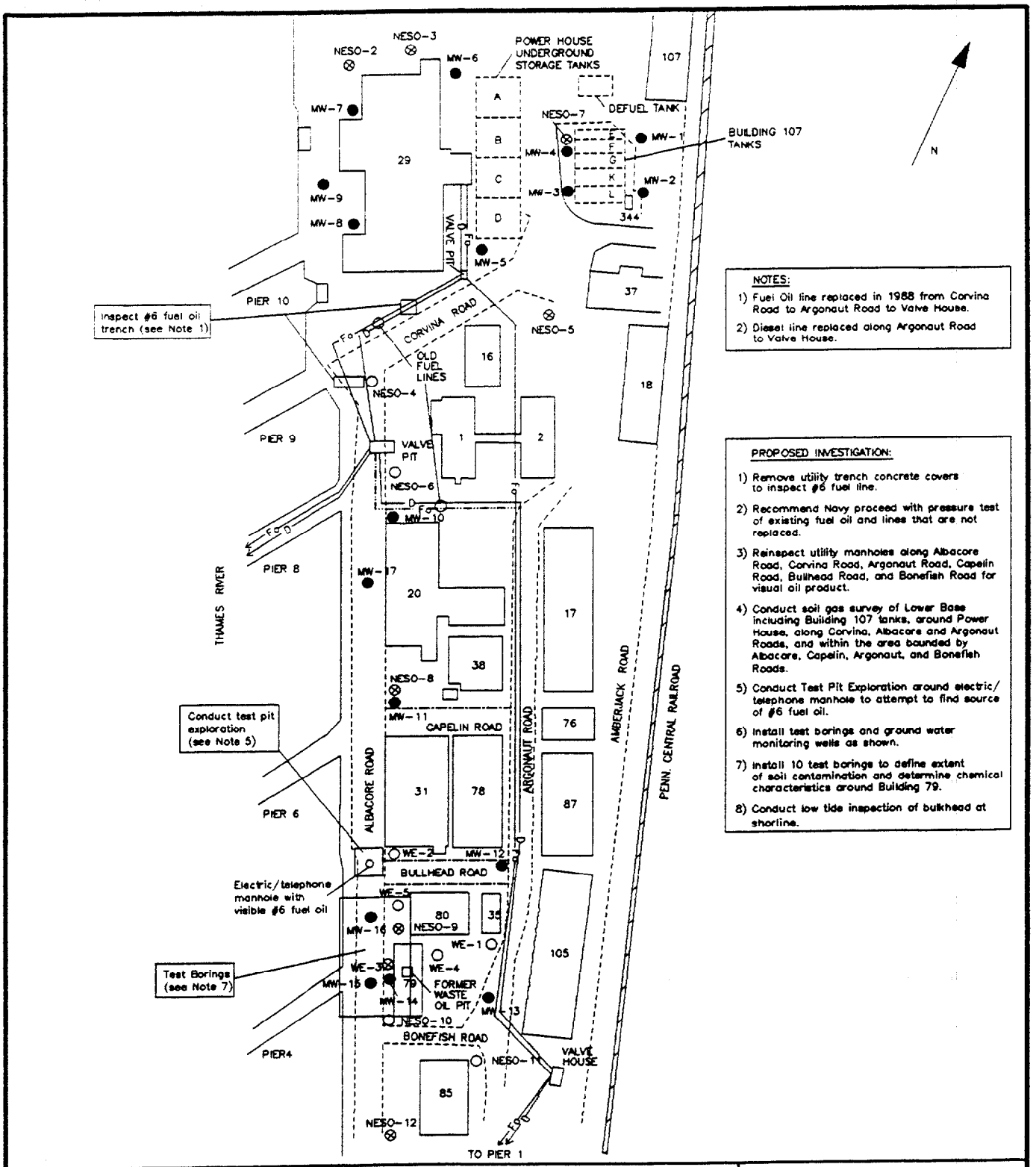
INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE
NEW LONDON
GROTON, CT

LEGEND

PROPOSED	EXISTING
● TB-1 – Test Boring	—95— Existing Grade
● MW-1 – Monitoring Well	Exposed Bedrock
▲-- SS-1 – Surface Soil Sample	○ B-1 – Test Boring

FIGURE 4-11
FIELD SAMPLING PLAN
DPDO AREA

ATLANTIC ENVIRONMENTAL SERVICES, INC.



NOTES:

1) Fuel Oil line replaced in 1988 from Corvina Road to Argonaut Road to Valve House.
2) Diesel line replaced along Argonaut Road to Valve House.

PROPOSED INVESTIGATION:

1) Remove utility trench concrete covers to inspect #6 fuel line.
2) Recommend Navy proceed with pressure test of existing fuel oil and lines that are not replaced.
3) Reinspect utility manholes along Albacore Road, Corvina Road, Argonaut Road, Capelin Road, Bullhead Road, and Bonefish Road for visual oil product.
4) Conduct soil gas survey of Lower Base including Building 107 tanks, around Power House, along Corvina, Albacore and Argonaut Roads, and within the area bounded by Albacore, Capelin, Argonaut, and Bonefish Roads.
5) Conduct Test Pit Exploration around electric/telephone manhole to attempt to find source of #6 fuel oil.
6) Install test borings and ground water monitoring wells as shown.
7) Install 10 test borings to define extent of soil contamination and determine chemical characteristics around Building 79.
8) Conduct low tide inspection of bulkhead at shorline.

INSTALLATION RESTORATION STUDY
NAVAL SUBMARINE BASE
NEW LONDON
GROTON, CT

LEGEND

PROPOSED	EXISTING
● MW-1 – Monitoring Well	-D- Diesel Line
● TB-1 – Test Boring	-Fo- Fuel Oil Line
	-Fo- Out of Service Fuel Oil Line
	○ NESO-1 – NESO Well
	○ WE-1 – Wehran Well
	⊗ Destroyed Well

FIGURE 4-12
FIELD SAMPLING PLAN
LOWER SUBASE

ATLANTIC ENVIRONMENTAL SERVICES, INC.

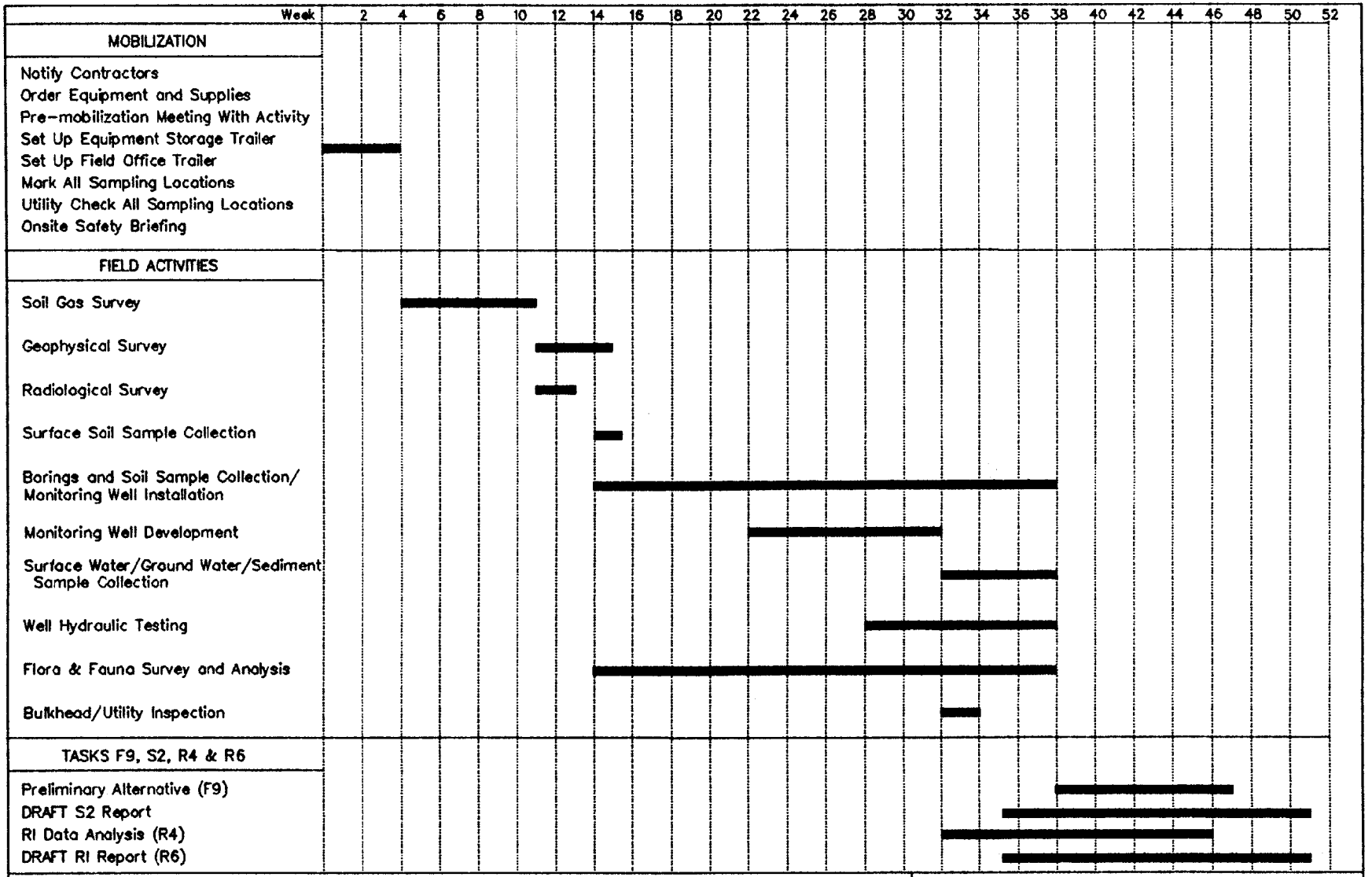
PROJECT SCHEDULE

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

PROJECT SCHEDULE*

Mobilization/Coordination	May 28, 1990 - June 25, 1990
Soil Gas Survey	June 25, 1990 - August 13, 1990
Radiation Survey	August 13, 1990 - August 27, 1990
Geophysical Survey	August 13, 1990 - September 10, 1990
Well Installation/Sampling	September 4, 1990 - February 18, 1991
Preliminary Development of Alternatives (due)	April 22, 1991
Draft SI/RI Report (due)	May 20, 1991
Final SI/RI Report (due)	August 26, 1991

* Schedule is tentative and subject to change.



Installation Restoration Study
Naval Submarine Base, New London, Groton, CT

PROJECT SCHEDULE

Atlantic Project No. 1256-10
Atlantic Environmental Services, Inc.

ATLANTIC