

EXECUTIVE SUMMARY  
FOR  
CONFIRMATION STUDY ON  
HAZARDOUS WASTE SITES  
AT  
NAVAL EDUCATION AND TRAINING CENTER  
NEWPORT, R.I.

EXECUTIVE SUMMARY  
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NEWPORT, R.I.

November 26, 1985

Prepared for:

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Comm. No. 502-10

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## CONFIRMATION STUDY

### EXECUTIVE SUMMARY

#### GENERAL

This Confirmation Study is a part of the Navy Assessment and Control of Installation Pollution (NACIP) Program "designed to identify contamination of Navy lands resulting from past operations and to institute corrective measures, as needed". The NACIP program consist of three distinct phases namely 1) initial assessment study (IAS), 2) confirmation study, and 3) corrective measures. The initial assessment study (conducted by others), was completed for the Naval Education and Training Center (NETC) in March, 1983. The IAS identified six sites where sufficient evidence exists to warrant confirmation studies, namely, 1) McAllister Point Landfill, 2) Melville North Landfill, 3) Tank Farm One, 4) Tank Farm Four, 5) Gould Island Disposal Area, and 6) Gould Island Electroplating Shop. The Confirmation Study consisted of an evaluation of previously identified sites to determine whether significant concentrations of toxic or hazardous materials are present and migrating by surface and/or subsurface routes, or whether the potential for migration exists. The Confirmation Study is conducted in two steps: a verification step and a characterization step. The scope of the work performed in the verification step was defined in the initial assessment study and modified slightly in conducting the verification step. The results of work performed in the verification step are fully discussed in a draft report submitted February 28, 1984 and revised May 8, 1984.

The characterization step was conducted on all six sites and the results are fully discussed in a draft report submitted March 13, 1985 and revised July 26, 1985. This executive summary presents a brief overview of the findings and recommendations of the entire confirmation study.

## OVERVIEW OF SITE SPECIFIC FINDINGS

McAllister Point Landfill. This landfill received all of the wastes generated at the Newport Naval Complex from 1955 through the mid-1970's and is known to contain at least 200 gallons of PCB contaminated oil. Also in the landfill are spent acids, wastes paints, solvents, and waste oils. In the verification step, samples of soil leachate, near-shore sediments, and mussels were collected for analysis. Control samples were collected at two stations in Narragansett Bay for comparison. Sediment and mussel samples were analyzed for PCB's and the following metals; chromium, cadmium, lead, arsenic, mercury, selenium, silver, copper, barium, nickel, beryllium, antimony, and tin. Soils and leachate samples were analyzed for priority pollutants.

The results of the verification step sampling and analysis indicate that metals are accumulating in sediments and mussels near the McAllister Point Landfill based on comparison to data from the control stations. Elevated levels of lead, copper, nickel, and chromium were detected in the sediments while elevated copper concentrations were found in the mussels.

The priority pollutant examinations of the leachate samples indicated all priority pollutants to be below detection limits except for certain metals, cyanides and phenols. Low concentrations of ethylbenzene and toluene were found in one leachate sample.

The priority pollutant examination of the composite soil sample indicated no significantly high values. Except for chromium, copper, lead, nickel and zinc, all priority pollutants in soils were below detection limits.

The sediment samples seemed to indicate that certain metals are accumulating in the vicinity of Station Nos. 12 and 13 near the south end of

the landfill. The pollutants are not being concentrated by the mussels to the same extent, although the copper concentrations in the mussels were substantially higher near the south end of the landfill than at other stations further north or at the control stations. There is no significant accumulation of metals in the soil cover.

The data seems to indicate that the landfill has caused or is continuing to cause metal deposition near Station Nos. 12 and 13.

Additional sampling and analysis were carried out in the characterization step, including sediment, mussel and groundwater sampling and analysis. All samples were analyzed for lead, copper, chromium, and nickel. Groundwater samples were also analyzed for priority pollutants, pH and chlorides.

In general, the off-shore sediments sampled in the characterization step were found to be less contaminated than the near-shore sediments. Elevated levels of lead, copper, and nickel were found in sediments close to shore but the chromium concentrations at these stations were only slightly above the control sample concentrations. Lead and copper are being assimilated by mussels at rates higher than the controls.

Four sets of samples were collected from the three monitoring wells, one upgradient and two downgradient of or in the fill. Samples from the two wells located in the landfill showed concentrations of lead and copper significantly higher than in the upgradient well. The results do not indicate that the landfill is a continuing major source of environmental contamination.

The following summarizes the remedial actions recommended for Site 01 - McAllister Point Landfill:

- Provide additional fill on the surface of the landfill to eliminate

all low areas and promote better drainage of surface water off the site.

- Provide an impervious clay cap and loam to promote growth of grass.
- Remove visible metallic debris from the landfill to the low water mark.
- Rip-rap the seaward face of the landfill to 10 feet above mean high water.
- Conduct additional sampling and analysis as follows:
  - ° Quarterly for one year, obtain groundwater and mussel samples (including controls) and analyze for lead, copper, and nickel; on the first set of groundwater samples, recheck the phthalates to resolve the apparent anomaly in the January 28, 1985 results.
  - ° Annually for five years, obtain groundwater, sediment and mussel samples (including controls) and analyze for lead, copper, and nickel.

The estimated cost for this work is \$1,100,000 exclusive of sampling and analysis.

Melville North Landfill. This site was used as a landfill from World War II to 1955. Wastes disposed of in this landfill included mostly domestic type refuse and some spent acids, waste paints, solvents, waste oils (diesel, fuel and lube), and PCB's.

In the verification step, samples of soil, near-shore sediments, and mussels were collected for analysis. The soil samples were analyzed for PCB's, chromium, cadmium, lead, arsenic, mercury, selenium, silver, copper, barium, nickel, beryllium, antimony, and tin.

The analytical data on samples collected indicate that there is no significant accumulation of metals or PCBs in sediment or mussels collected at the three marine sampling points in comparison to data from control stations. The composite soil sample indicated the presence of some lead and very high concentrations of petroleum based hydrocarbons (PBHC). No PCBs were detected.

Visual soil examinations were conducted in the characterization step in

order to determine the extent of the PBHC contaminated soil. None of the test holes showed any significant travel of oil laterally away from the piles. Some of the holes showed accumulations of waste bituminous paving material. These investigations indicate that the oily material has not migrated laterally away from the surface piles of the soil. Some downward migration may have occurred under the piles, but there was no indication of this at holes adjacent to the piles.

The following summarizes the remedial actions recommended for Site 02 - Melville North Landfill:

- Remove the oily soil piles to the limits shown on Figure No. 5 and dispose of the material as oil spill clean-up materials.
- Fill the disturbed area with clean soil, grade to drain and provide loam to promote growth of grass.

The estimated cost for this work is \$80,000.

Tank Farm One. This site includes six underground tanks each with a capacity of 60,000 barrels. Five of these tanks are now used for the storage of oils including aviation fuel. One tank is no longer used. In the past, these tanks were periodically cleaned to remove the sludge material which, over time, settles on the bottoms of the tanks. This practice occurred from World War II until the 1970's.

When the tanks were cleaned, the sludge material was placed in a pit which was approximately 20 feet long, 10 feet wide, and 4 feet deep. These disposal pits were simply dug in the general vicinity of the tank being cleaned. The sludge was placed in the pits and allowed to weather for a few weeks. The pits were then covered over and marked with signs warning of tetraethyllead. These pits are spread throughout the tank farm, but through the years, most of the signs marking the disposal areas have disappeared. Only two markers remain at this time and samples were collected at those two locations.

Both groundwater and soil samples were collected in the verification step. The groundwater samples were analyzed for petroleum based hydrocarbons (PBHC), lead, and BTX (benzene, toluene, xylene). The soil samples were analyzed for lead and oil and grease.

The analytical data on all samples collected indicated the presence of oil or gasoline contaminants in the soil and groundwater at Tank Farm One. This judgment was based on the magnitude of the oil and grease concentrations in soil samples and the BTX concentrations in groundwater samples. Although some lead was found in the soil samples, the concentrations were relatively low and no lead was found in groundwater. The concentrations of BTX and petroleum based hydrocarbons in the groundwater samples were high; BTX contamination indicates pollutants from light oils such as gasoline.

The analytical data confirm the presence of oil and grease in deposits at the suspected locations of previous tank sediment burial pits. The analysis of groundwater samples confirmed that BTX contaminants are present in the groundwaters at one or more of the buried storage tanks.

As a result, groundwater monitoring wells were installed at two locations to enable collection of groundwater samples at three stations; Soil samples were collected at three stations in the characterization phase. The groundwater samples were analyzed for PBHC and BTX, and the soil samples and some groundwater samples were analyzed for oil identification using high resolution gas chromatography to match the characteristics of oils found in the soil with oils found in the groundwater samples.

The results indicate that the petroleum products found in the soils from the old burial locations are weathered materials similar to No. 6 or Bunker C fuel oil. The petroleum products found in all other samples were

significantly different and were indicative of weathered gasoline. No evidence was found to indicate that oil from previous disposal practices is entering the groundwater.

There are some petroleum-based hydrocarbons and BTX present in the groundwater underdrainage system and the oil-water separator is generally performing well in limiting these discharges to the Bay. No BTX was found in either groundwater monitoring well.

The results of the studies indicate that some light petroleum products have entered the groundwater but not from previous waste disposal practices. Consequently, the site does not require further study, investigation, or remedial action under the NACIP program.

Tank Farm Four. This site has 12 concrete underground tanks, each with a capacity of 60,000 barrels. These tanks were used to store diesel and fuel oil but their use was discontinued several years ago, when they were emptied (but not cleaned) and refilled with water. When the tanks were in use, the bottom sludge was periodically removed and disposed of by burning; however, there was some suspicion that the cleanings were disposed of on the ground in the general vicinity of the tank being cleaned. There are no indications on the site as to specifically where these deposits, if any, were made.

Sediment, surface water, and soil samples were collected for analysis at this site in the verification step. The surface water and sediment samples were analyzed for lead and PBHC and the soil samples were composited into a single sample which was analyzed for lead and oil and grease. The analytical data indicated that one or more of the soil samples was high in lead and/or oil and grease and that some petroleum based hydrocarbons may be escaping via surface runoff. The sources of these contaminants could be

either of the following:

- Undefined locations of burial or dumping areas for tank bottom sediments.
- Leakage from tanks numbered 37 to 48 which were emptied but not cleaned when taken out of service.

In order to determine whether or not contaminants in the soils and/or abandoned tanks are migrating off-site, two groundwater monitoring wells were drilled in the characterization phase. Additionally, the water phase of six of the twelve tanks was sampled and analyzed so that a determination can be made as to the fate of this liquid. All samples collected were analyzed for lead and PBHC.

The analytical data indicate that there is some petroleum-based hydrocarbon contamination in the groundwater. No significant concentrations of lead were found. Since the direction of groundwater movement is toward Norman's Brook and the Bay, no water supplies could be affected by this contamination and any impact on beneficial uses of the groundwater or the Bay would be practically non-detectable.

The pollutants found in the bottom water of the oil storage tanks are such that the waters could be discharged to a sanitary sewer during oil removal operations if necessary. A temporary oil-water separator would be desirable to avoid the possibility of a discharge of oil to the sewer system.

The following summarizes the remedial actions recommended for Site 12 - Tank Farm Four:

- Remove all oil and water from the existing storage tanks, collapse the roofs of the tanks and fill the voids with bank run gravel to comply with state and federal underground tank regulations.

- Conduct additional sampling and analysis as follows:
  - ° Quarterly for one year, obtain groundwater samples and analyze for PBHC.
  - ° Annually for five years, obtain groundwater samples and analyze for PBHC.

The estimated cost for this work is \$2,600,000, exclusive of sampling and analysis.

Gould Island Disposal Area. This site was used throughout the World War II period and received all the wastes generated on the island. Some wastes were incinerated on the site and the ash was dumped on the site along with other wastes. The deposits were made on a steep slope facing Narragansett Bay on the west side of the island. The site was last used about 30 years ago. In addition to the normal types of industrial refuse, there was considerable waste production from electroplating and degreasing operations on the island during World War II. Wastes from these operations would have gone to this site unless they were discharged directly into Narragansett Bay. These wastes would have included muriatic acid, chromic acid, copper cyanide, sodium cyanide, sodium hydroxide, nickel sulfate, and Anodex cleaner.

In the verification step, samples of near-shore sediments and mussels were collected for analysis. All samples were analyzed for PCB, chromium, cadmium, lead, arsenic, mercury, selenium, silver, copper, barium, nickel, beryllium, antimony, and tin.

The analytical data on samples collected indicated that metals are accumulating in sediments and mussels near the Gould Island Disposal area. This judgment is based on comparison of the verification step sampling and analytical data with the control station data. Elevated levels of lead, copper, chromium, and nickel were detected in the sediments. No PCB contamination was found in any of the sediment samples.

Slightly elevated copper concentrations were found in mussels by comparison to the controls. These do not appear to be significantly high,

however. No other metals were found in the mussel samples. The PCB levels in mussels were lower than those found in the controls.

Additional sediment and mussel sampling and analysis was conducted in the characterization step. All of the samples were analyzed for lead, copper, chromium, and nickel.

In general, the off-shore sediments sampled in the characterization step were found to be less contaminated than the near-shore sediments. Elevated levels of lead and copper were found in sediments close to shore. The chromium and nickel concentrations at these stations were only slightly above the control sample concentrations. Lead and copper are being assimilated by mussels at rates higher than the controls.

The following summarizes the remedial actions recommended for Site 14 - Gould Island Disposal Area:

- Remove visible metallic debris from the face of the landfill.
- Provide cover on the exposed face of the landfill.
- Provide an impervious clay cap and loam to promote growth of grass.
- Rip-rap the seaward face of the landfill to 10 feet above mean high water.
- Intercept surface water as required.
- Conduct additional sampling and analysis as follows:
  - ° Quarterly for one year, obtain mussel samples (including controls) and analyze for lead and copper.
  - ° Annually for five years, obtain sediment and mussel samples (including controls) and analyze for lead and copper.

The estimated cost of this work is \$650,000, exclusive of sampling and analysis.

Gould Island Electroplating Shop. Extensive electroplating and degreasing operations occurred on Gould Island (Building 32) during World War II. These operations existed only during the war. The wastes generated included muriatic acid, chromic acid, copper cyanide, sodium cyanide, sodium hydroxide, nickel sulfate, Anodex cleaner, and degreasing solvents. The

method of disposal could not be verified. However, rinse water was most likely discharged into the bay while concentrated spent plating solutions were probably bled slowly into the wastewater stream. Plating sludges, on the other hand, were probably disposed of in the landfill.

Both sediment and mussel samples were collected at this site during the verification step. The samples were analyzed for cyanide (sediment only), chromium, cadmium, lead, mercury, silver, copper, and nickel.

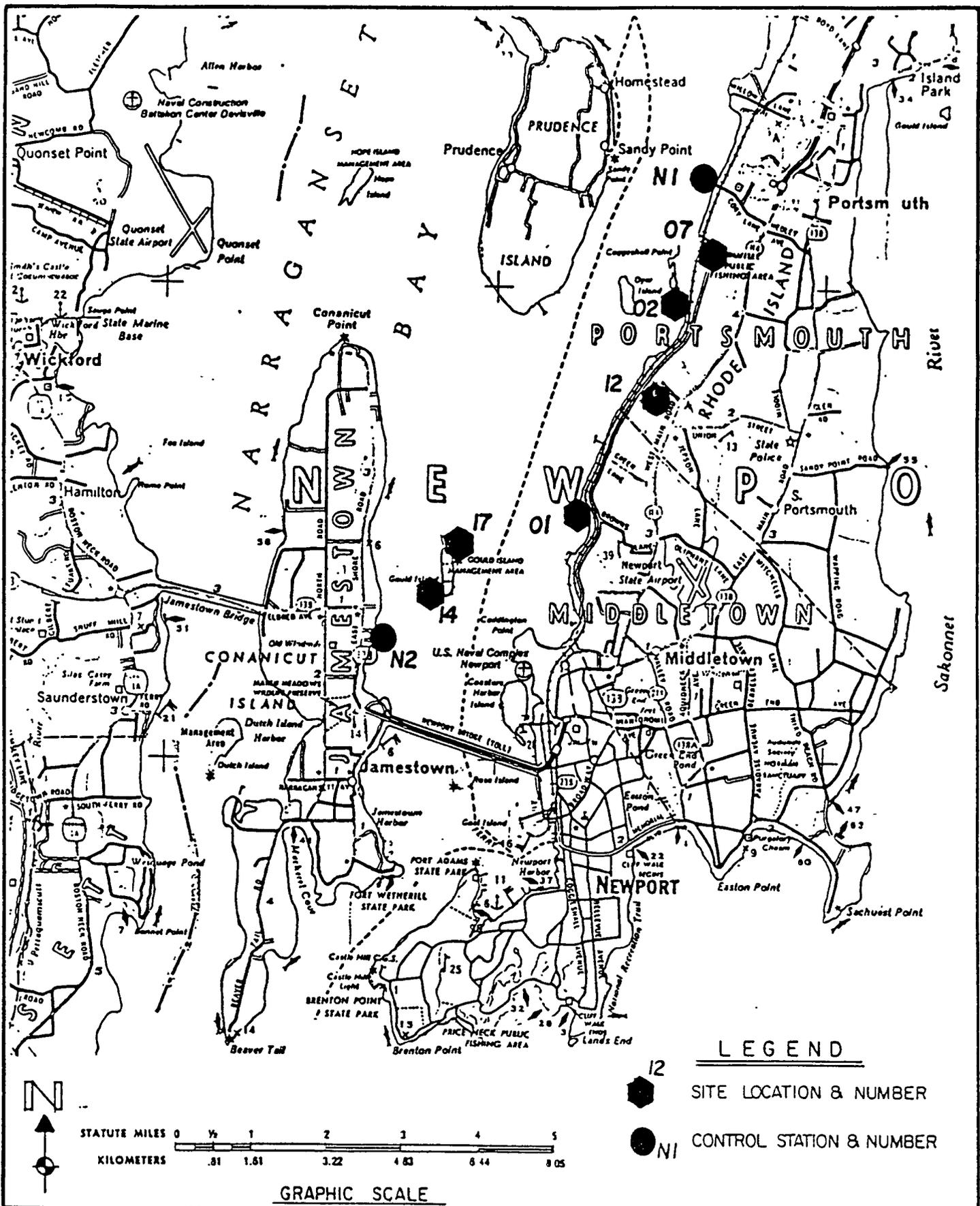
The analytical data on samples collected indicated that slightly elevated concentrations of cyanide and copper are present in sediments and an elevated concentration of copper is present in mussels collected from the vicinity of one of the discharge pipes at the Gould Island Electroplating Shop.

Additional mussel sampling and analysis was conducted during the characterization step. The sample was analyzed for chromium, copper, lead, and nickel.

The analytical data on samples collected indicate that metals in mussels are comparable to the controls.

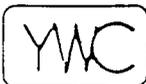
No further studies or remedial actions are needed at this site because the levels of contaminants found are not significantly high.

CONTROL SAMPLING POINTS



CONFIRMATION STUDY  
 ON HAZARDOUS WASTE SITES  
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SITES INVESTIGATED  
 & CONTROL SAMPLING STATIONS



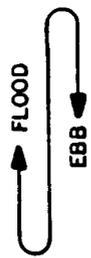
York Wastewater Consultants, Inc.  
 Stamford, Connecticut

LEA LOUREIRO ENGINEERING ASSOCIATES  
 a professional corporation  
 CONSULTING ENGINEERS  
 JAVON, CT

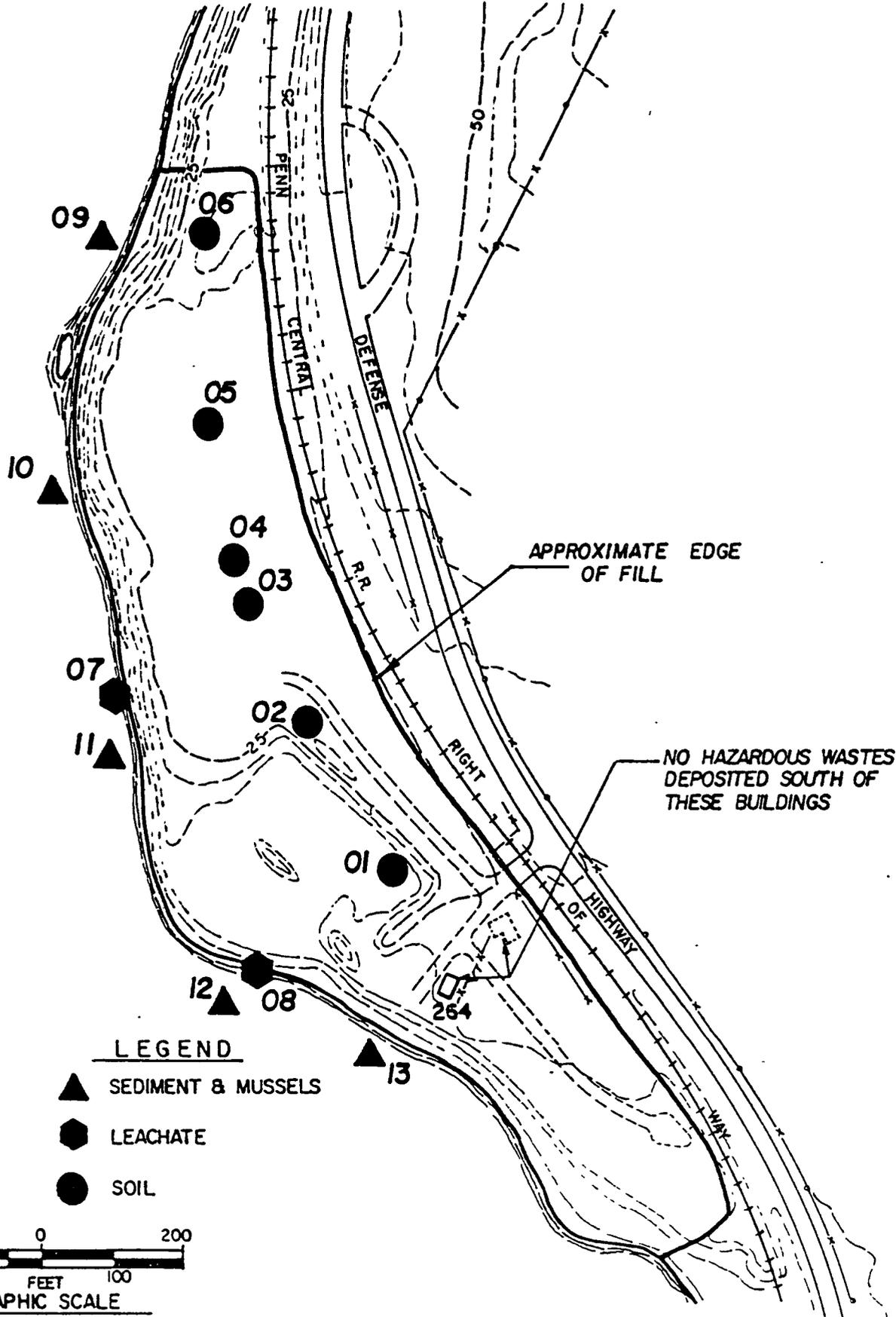
MAR. 13, 1985

FIG. NO. 2

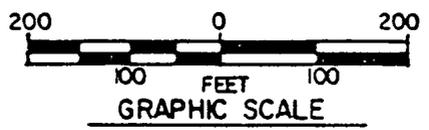
VERIFICATION SAMPLING POINTS



NARRAGANSETT BAY  
EAST PASSAGE



- LEGEND**
- ▲ SEDIMENT & MUSSELS
  - LEACHATE
  - SOIL



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
NEWPORT NAVAL EDUCATION &  
TRAINING CENTER

McALLISTER POINT LANDFILL  
SITE NO 01  
VERIFICATION SAMPLING POINTS



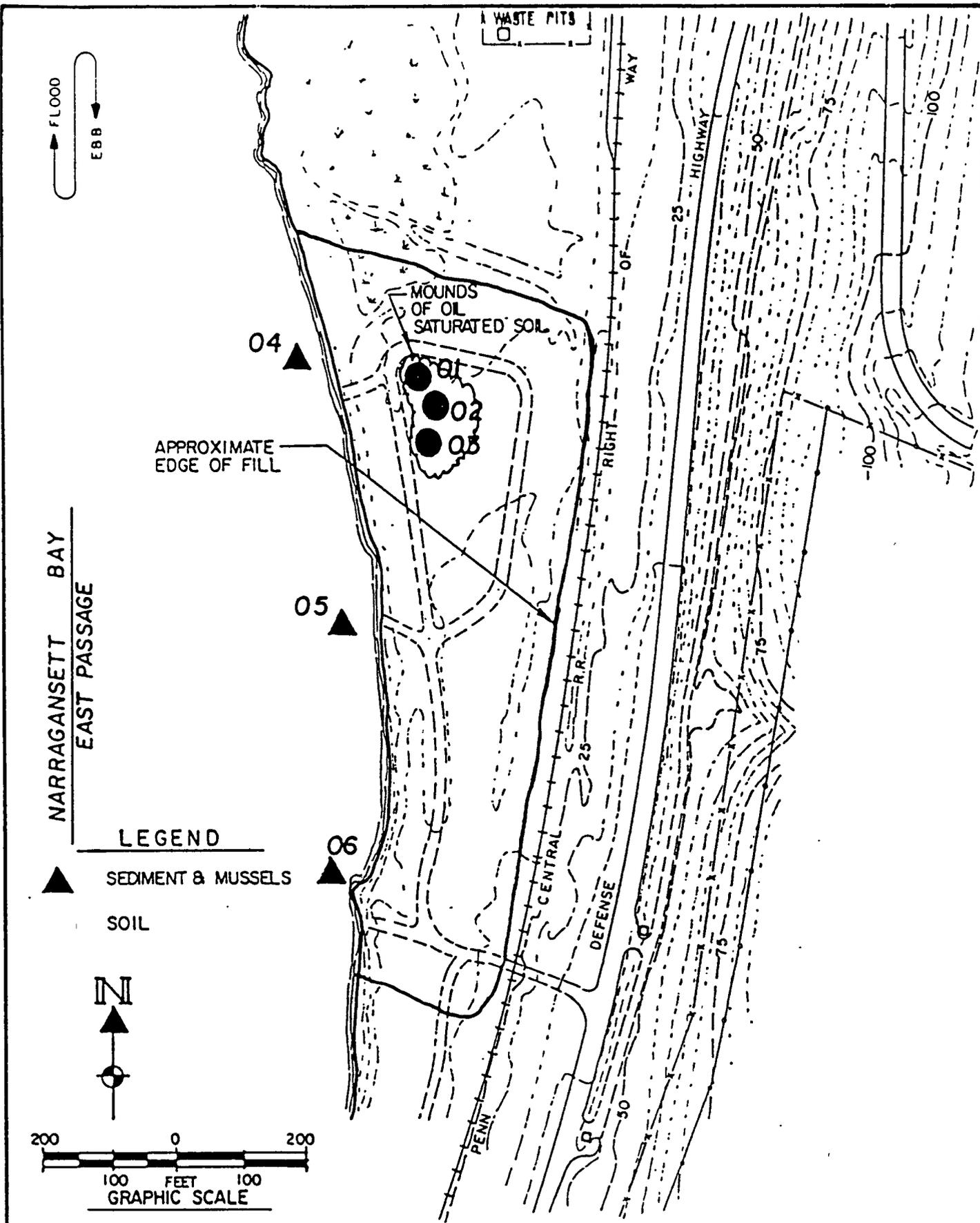
York Wastewater Consultants, Inc  
Stamford, Connecticut



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Professional Corporation  
CONSULTING ENGINEERS  
AVON, CT.

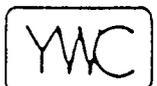
FEB. 28, 1984  
REVISED MAY 8, 1984

FIG. NO. 3



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
NEWPORT NAVAL EDUCATION &  
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MELVILLE NORTH LANDFILL  
SITE NO 02  
VERIFICATION SAMPLING POINTS



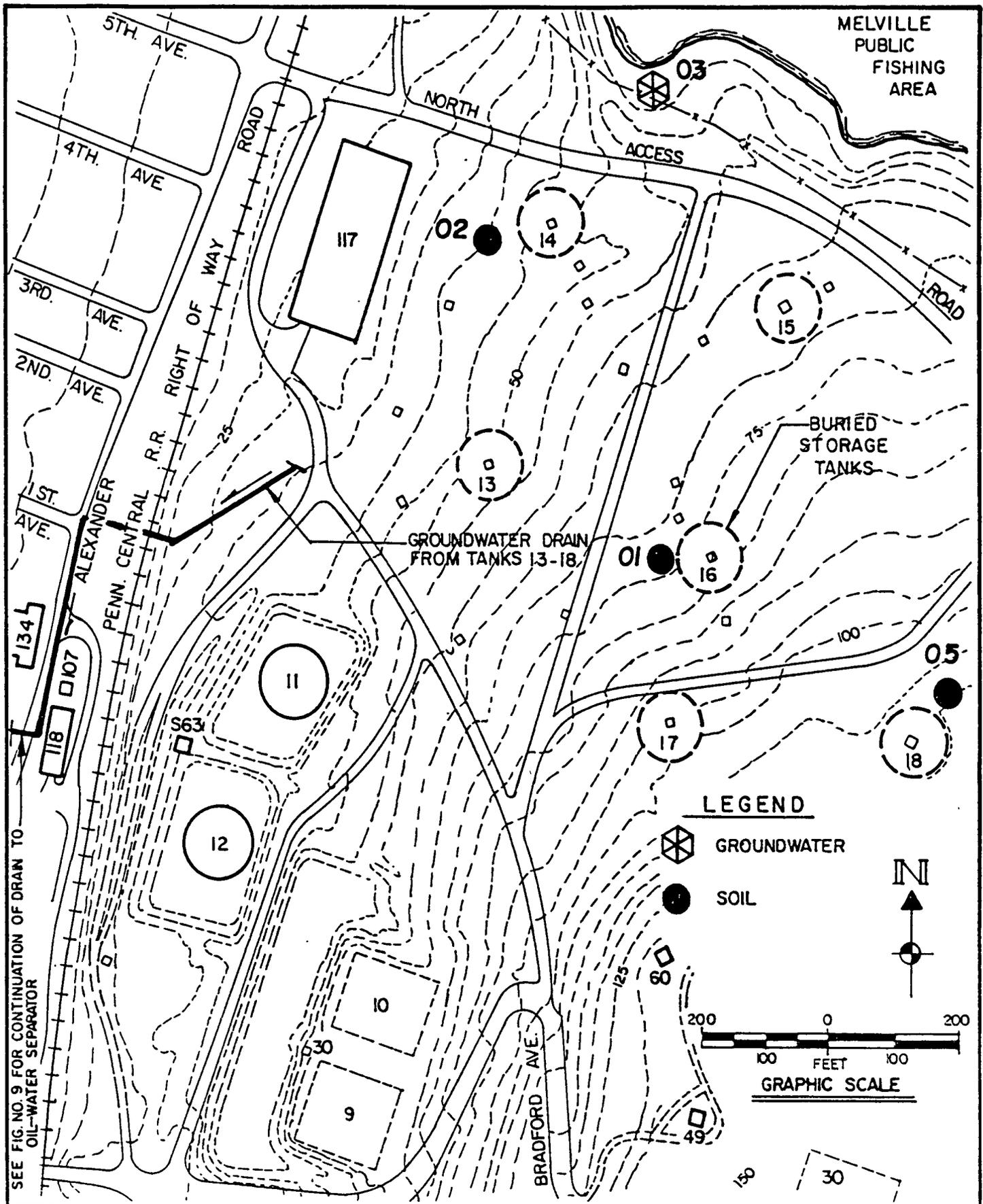
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Stamford, Connecticut

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FIG. NO. 5



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
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TANK FARM ONE  
SITE NO 07  
VERIFICATION SAMPLING POINTS



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FIG. NO. 8

CHAMBER 163

NOTE: THIS DRAIN COLLECTS GROUNDWATER FROM THE VICINITY OF BURIED TANKS NUMBERED 13 TO 18 (SEE FIG. NO. 8 FOR CONTINUATION)

SLAB TO BLDG 65

QUARTERS D

6" AC. B.S.W.

OIL-WATER SEPARATOR

NOTE: THESE BYPASS LINES WERE USED DURING SAMPLING AT STATION 04

HOLDING BASIN 04

OIL-WATER SEPARATOR

ROAD

ALEXANDER

M.H.

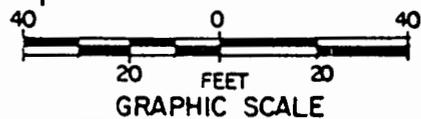
IN



LEGEND

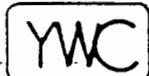


GROUNDWATER



CONFIRMATION STUDY ON HAZARDOUS WASTE SITES NEWPORT NAVAL EDUCATION & TRAINING CENTER

TANK FARM ONE - OIL-WATER SEPARATOR SITE NO 07 VERIFICATION SAMPLING POINTS

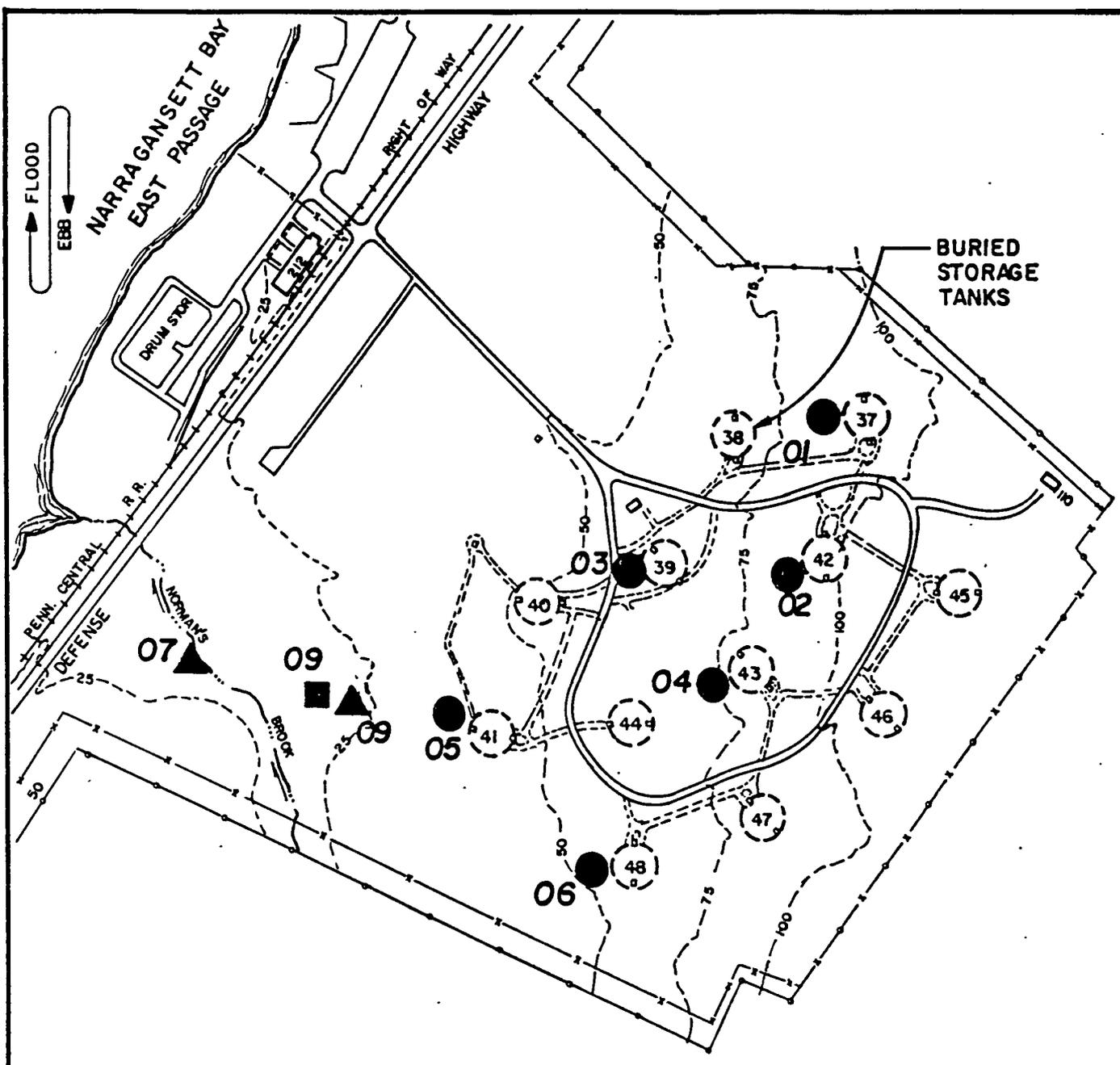


York Wastewater Consultants, Inc. Stamford, Connecticut

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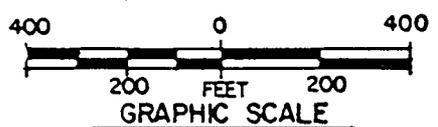
FEB. 28, 1984

FIG. NO. 9



**LEGEND**

- N
- SEDIMENT
- SURFACE WATER
- SOIL



**NOTE:**

THE SURFACE WATER AT STATION 09 WAS ACTUALLY GROUNDWATER SEEPAGE IN WET WEATHER.

CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
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**TANK FARM FOUR  
SITE NO 12  
VERIFICATION SAMPLING POINTS**



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FEB. 28, 1984

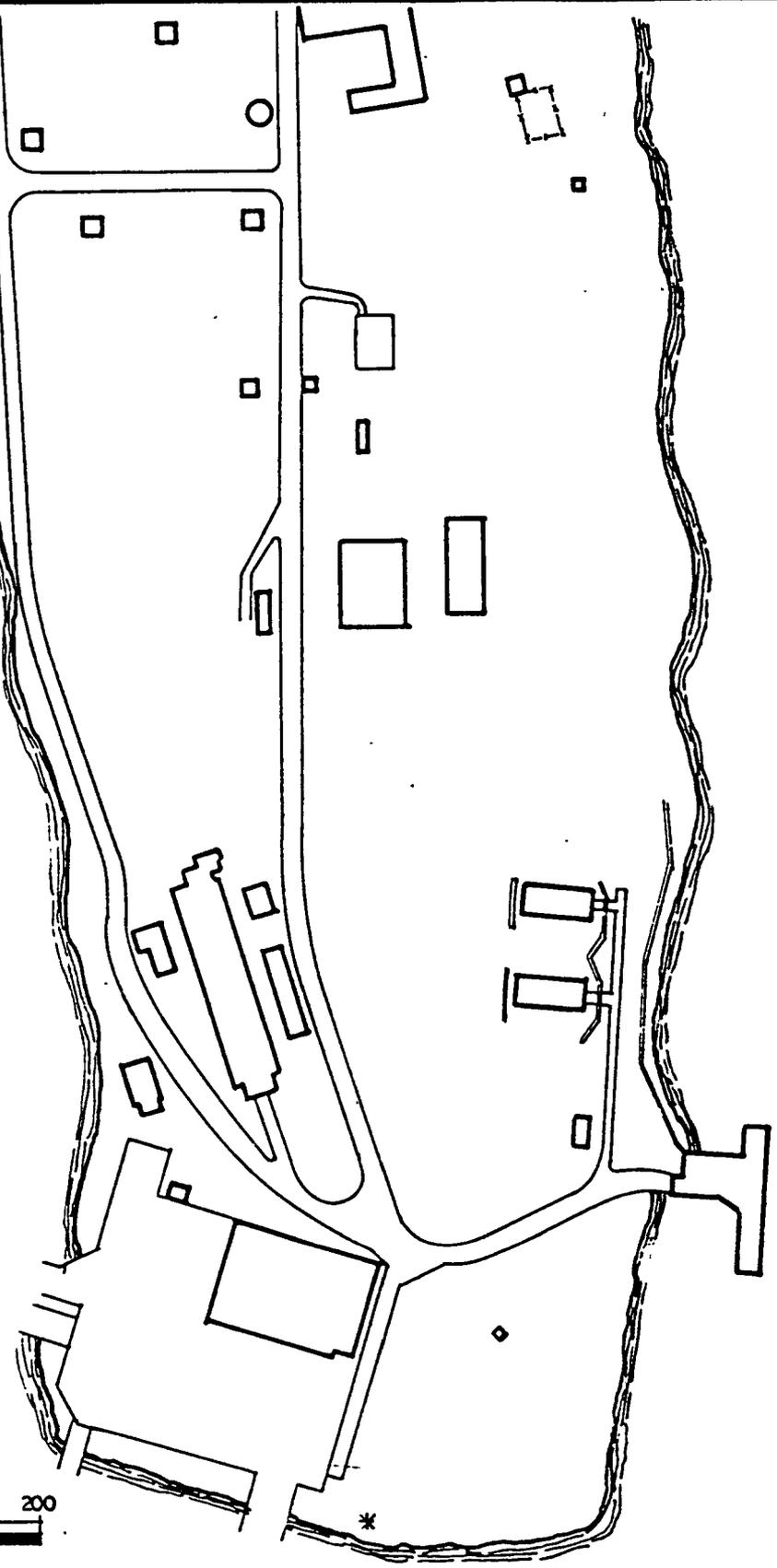
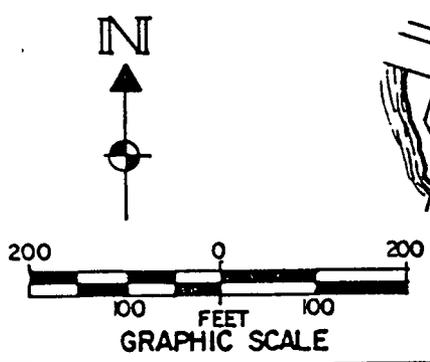
FIG. NO. 12

GOULD ISLAND  
DISPOSAL AREA

01 ▲  
02 ▲  
03 ▲

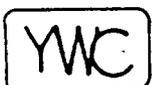


LEGEND  
▲ SEDIMENT & MUSSELS



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
NEWPORT NAVAL EDUCATION &  
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GOULD ISLAND DISPOSAL AREA  
SITE NO 14  
VERIFICATION SAMPLING POINTS



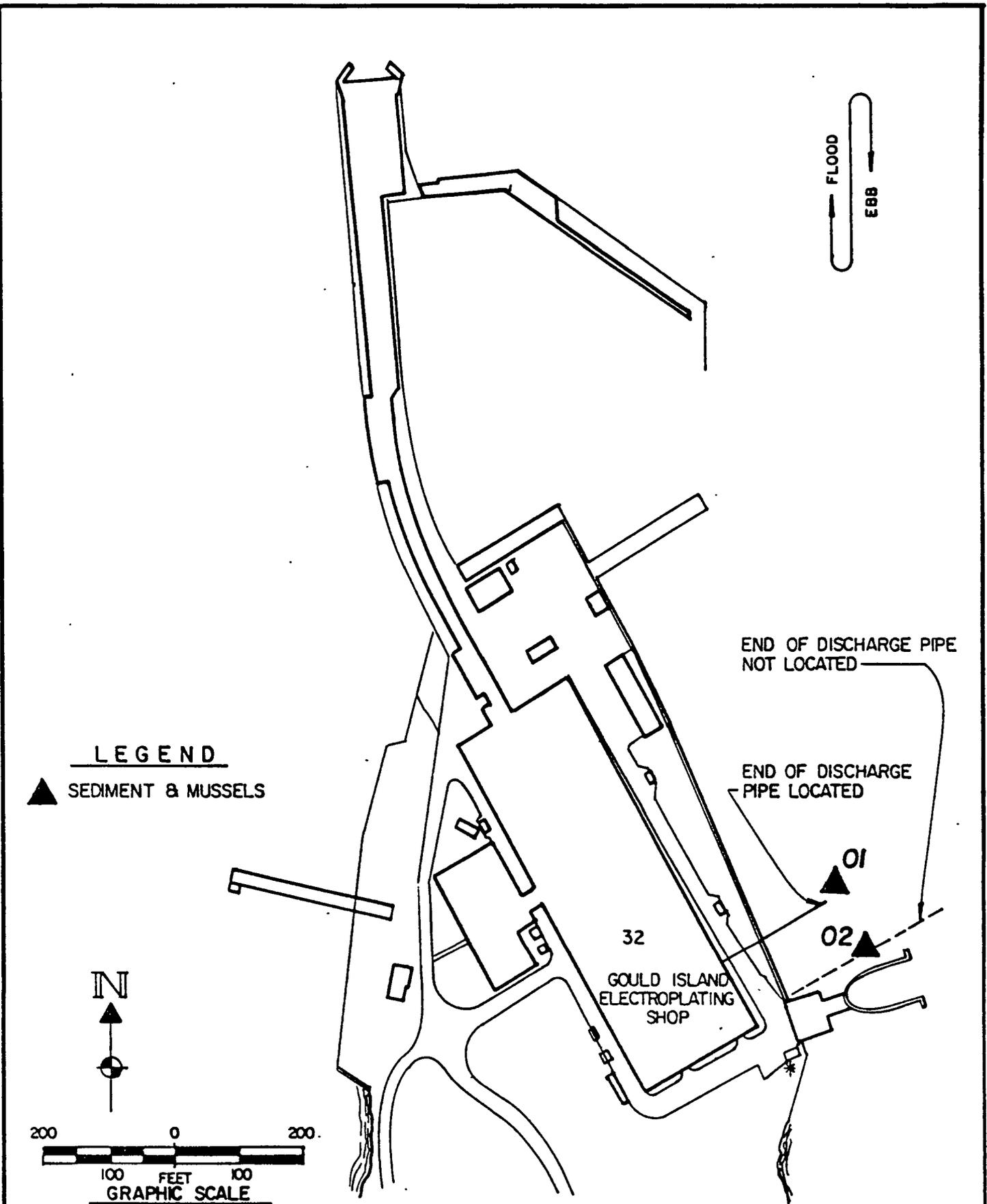
York Wastewater Consultants, Inc.  
Stamford, Connecticut



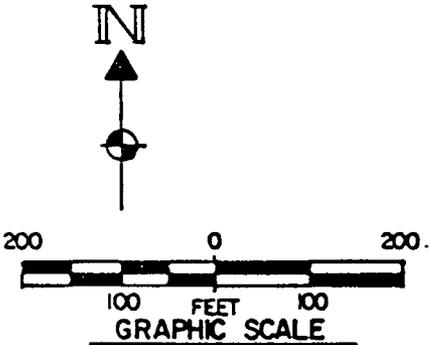
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FIG. NO. 14



**LEGEND**  
 ▲ SEDIMENT & MUSSELS



END OF DISCHARGE PIPE NOT LOCATED

END OF DISCHARGE PIPE LOCATED

32  
 GOULD ISLAND  
 ELECTROPLATING  
 SHOP

CONFIRMATION STUDY  
 ON HAZARDOUS WASTE SITES  
 NEWPORT NAVAL EDUCATION &  
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GOULD ISLAND ELECTROPLATING SHOP  
 SITE NO 17  
 VERIFICATION SAMPLING POINTS



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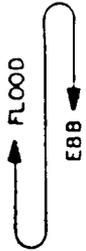
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FEB. 28, 1984

FIG. NO. 16

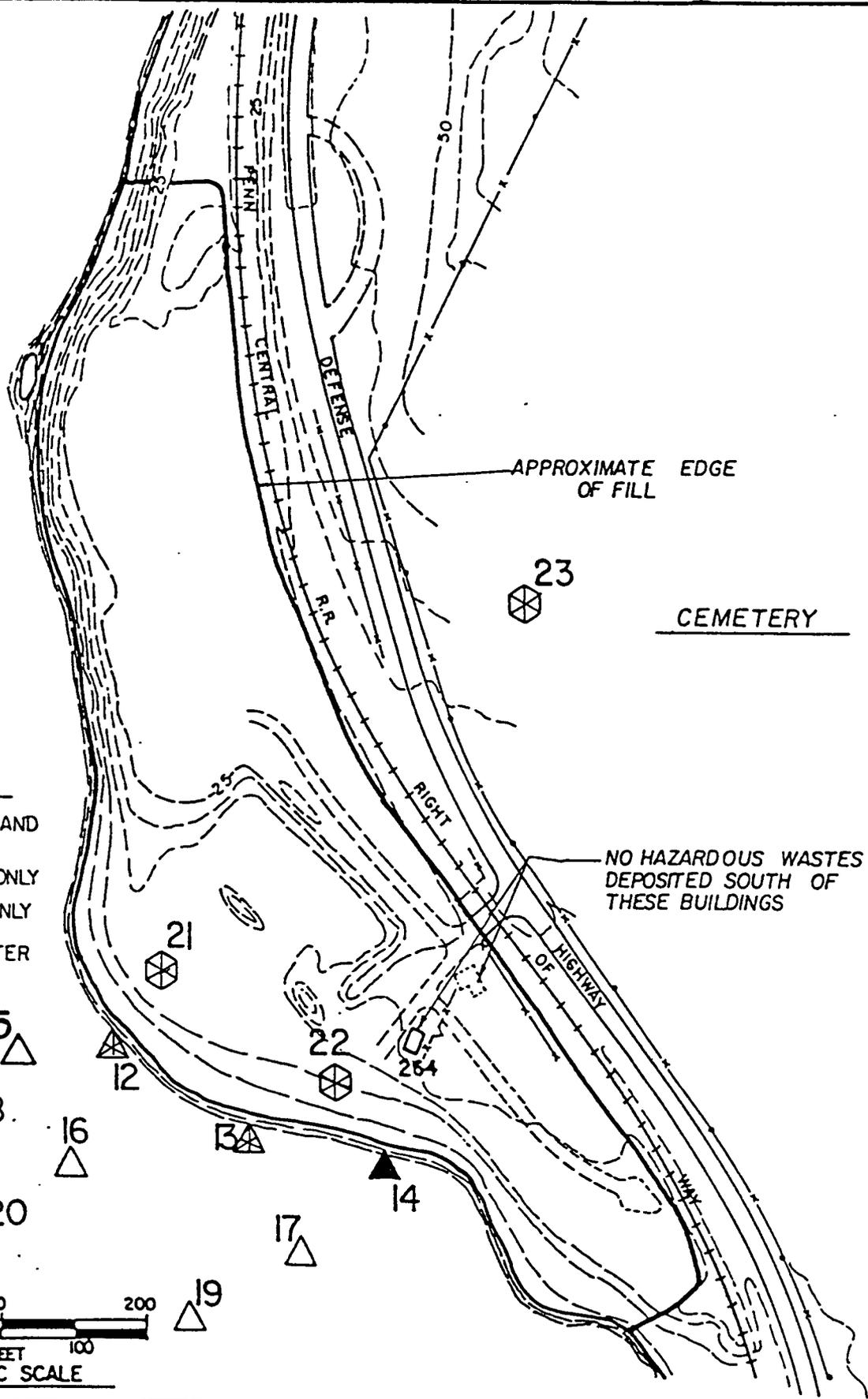
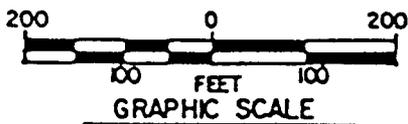
CHARACTERIZATION SAMPLING POINTS



NARRAGANSETT BAY  
EAST PASSAGE

LEGEND

- ▲ SEDIMENT AND MUSSELS
- △ SEDIMENT ONLY
- ⊠ MUSSELS ONLY
- ⊞ GROUNDWATER



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
NEWPORT NAVAL EDUCATION &  
TRAINING CENTER

McALLISTER POINT LANDFILL  
SITE NO 01  
CHARACTERIZATION SAMPLING POINTS

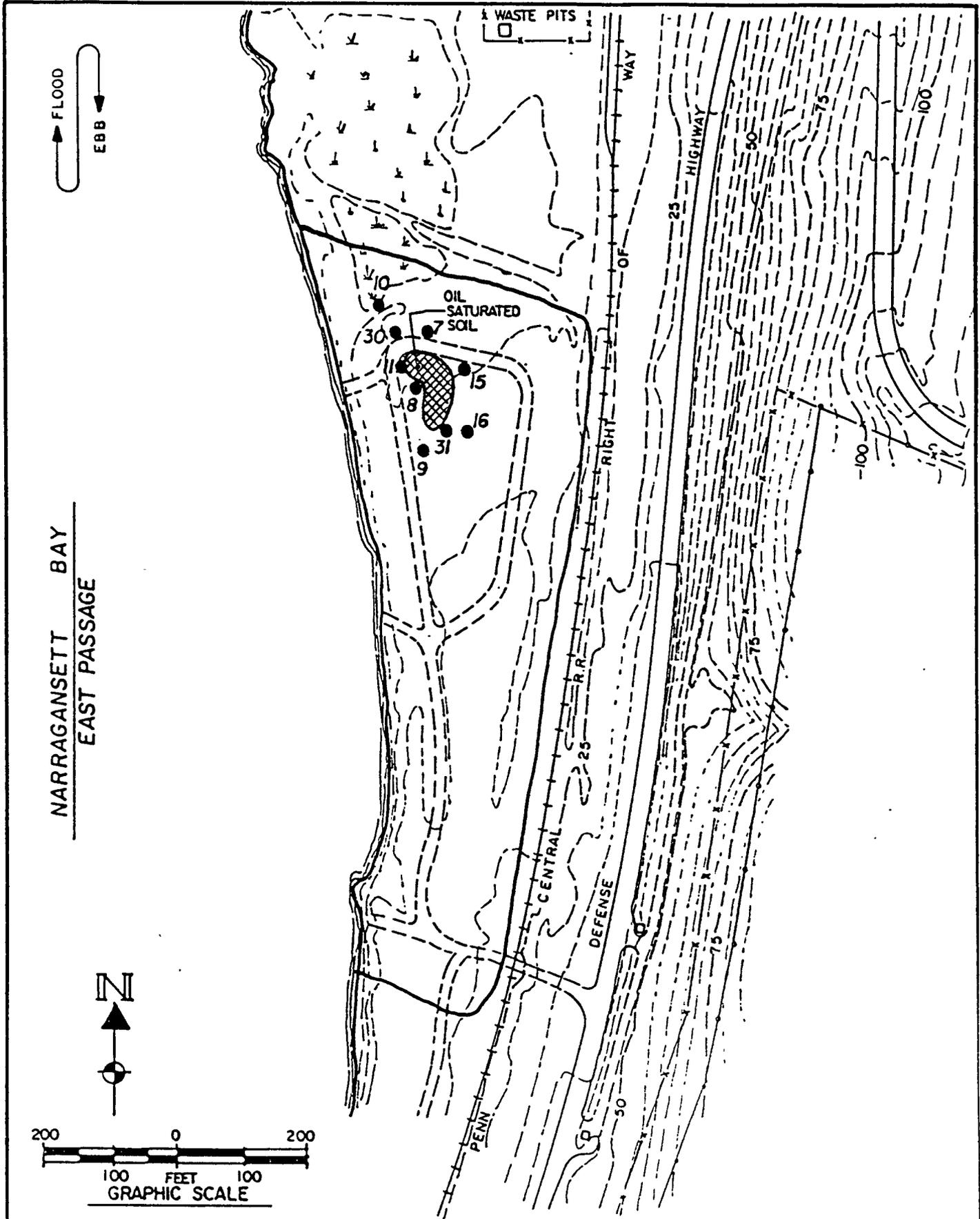


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Stamford, Connecticut

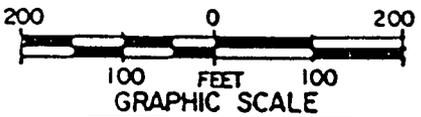
LEA LOUREIRO ENGINEERING ASSOCIATES  
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MAR. 13, 1985

FIG. NO. 4

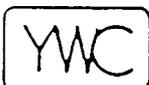


NARRAGANSETT BAY  
EAST PASSAGE



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
NEWPORT NAVAL EDUCATION &  
TRAINING CENTER

MELVILLE NORTH LANDFILL  
SITE NO 02  
CHARACTERIZATION SAMPLING POINTS



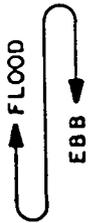
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CONSULTING ENGINEERS AVON, CT.

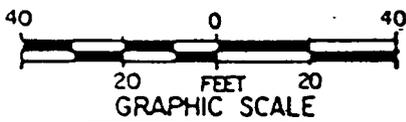
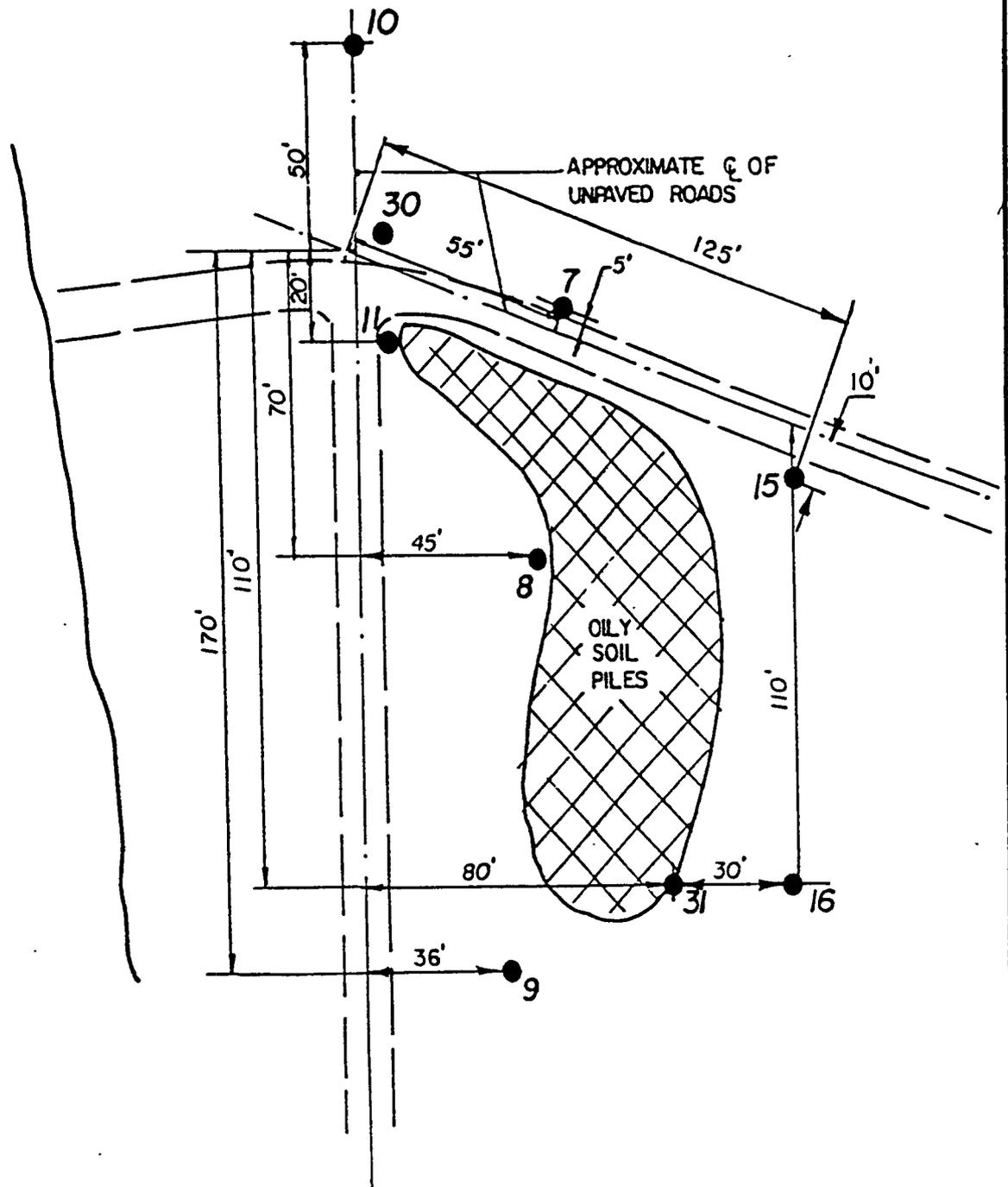
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FIG. NO. 6

OILY SOIL PILES = 6000 S.F. @ 3 FEET  
 AVE. DEPTH = 670 C.Y.

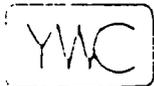


NARRAGANSETT BAY  
 EAST PASSAGE



CONFIRMATION STUDY  
 ON HAZARDOUS WASTE SITES  
 NEWPORT NAVAL EDUCATION &  
 TRAINING CENTER

MELVILLE NORTH LANDFILL  
 SITE NO. 02  
 SOIL SAMPLING LOCATIONS



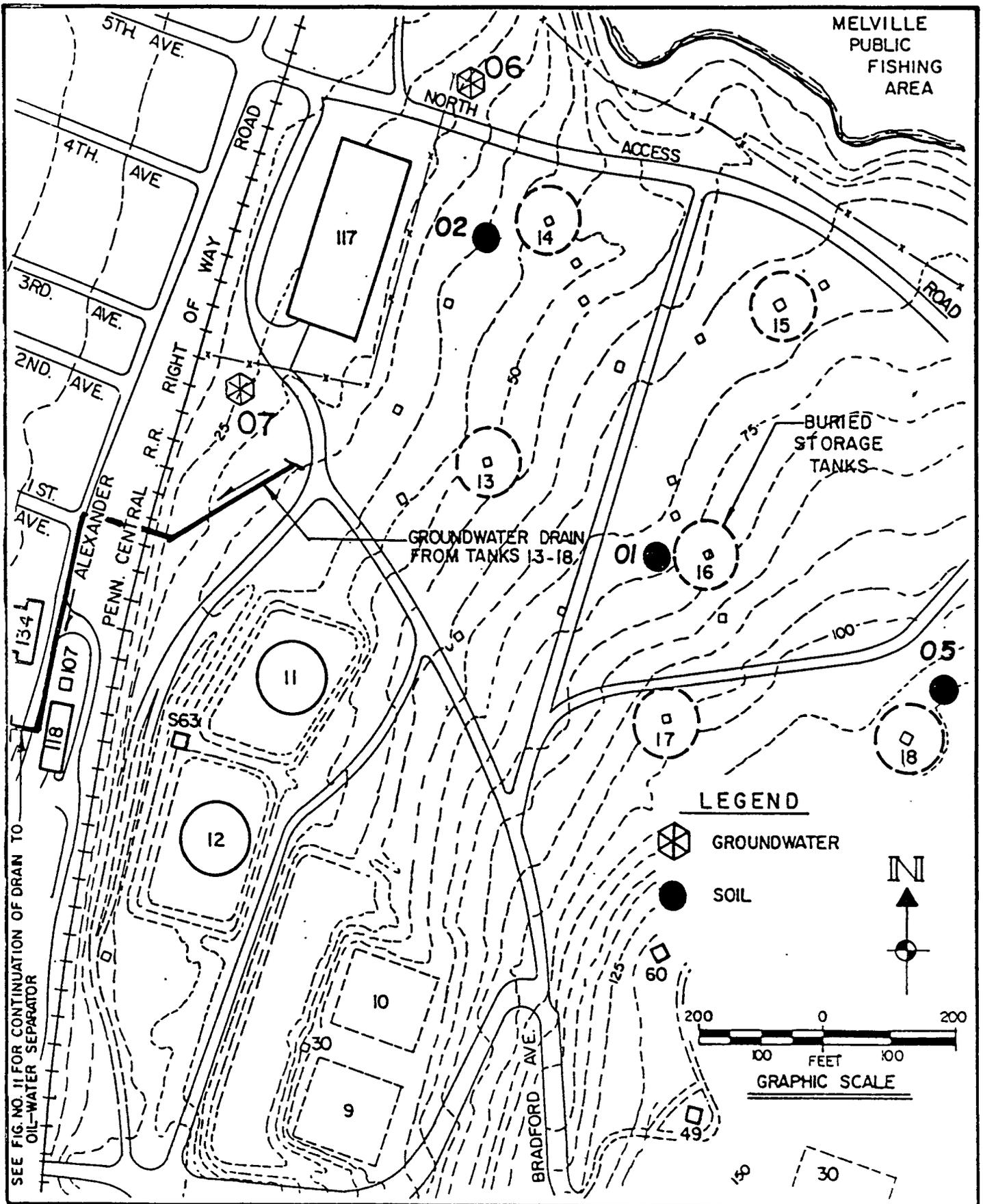
YWC  
 Hazardous Waste Consultants, Inc.  
 Stamford, Connecticut



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 CONSULTING ENGINEERS  
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FIG. NO. 7

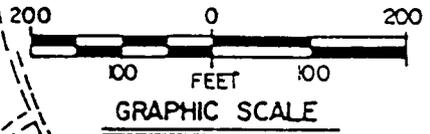


MELVILLE  
PUBLIC  
FISHING  
AREA

SEE FIG. NO. 11 FOR CONTINUATION OF DRAIN TO  
OIL-WATER SEPARATOR

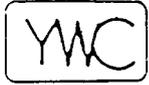
**LEGEND**

-  GROUNDWATER
-  SOIL



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
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TRAINING CENTER

**TANK FARM ONE  
SITE NO 07  
CHARACTERIZATION SAMPLING POINTS**

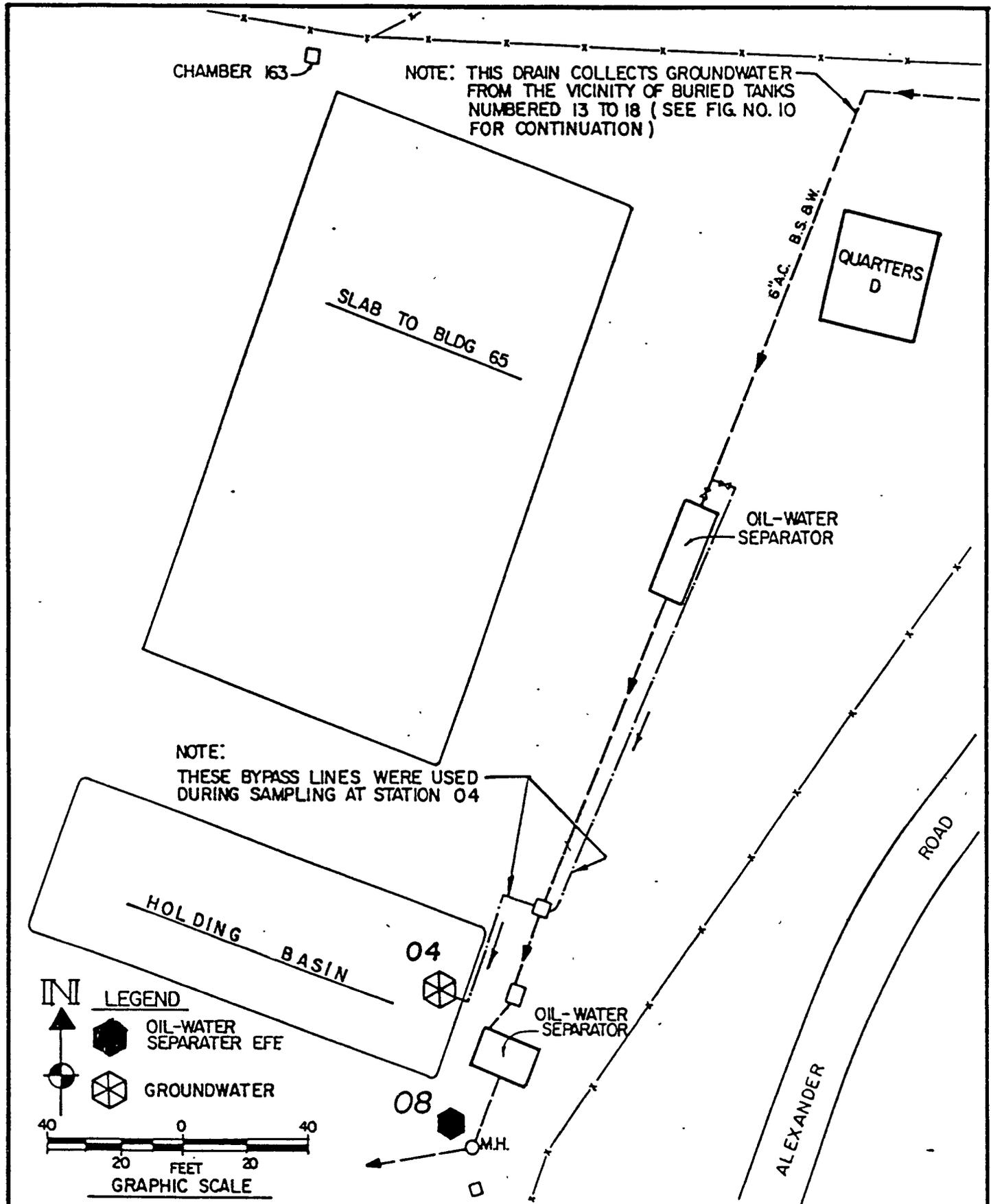


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CONSULTING ENGINEERS AVON, CT.

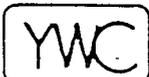
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FIG. NO. 10



CONFIRMATION STUDY  
ON HAZARDOUS WASTE SITES  
NEWPORT NAVAL EDUCATION &  
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TANK FARM ONE - OIL-WATER SEPARATOR  
SITE NO 07  
CHARACTERIZATION SAMPLING POINTS



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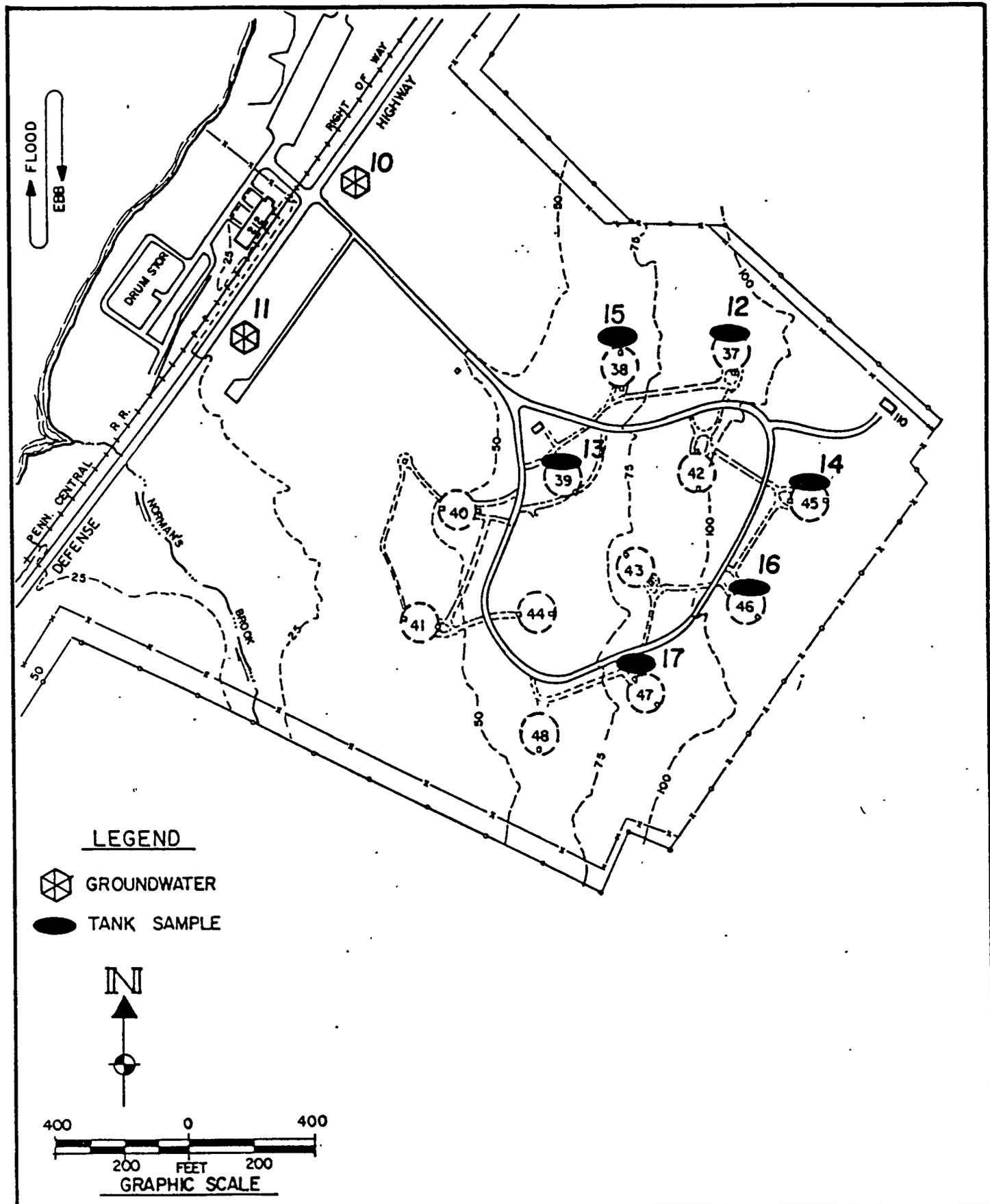
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FIG. NO. 11



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TANK FARM FOUR  
SITE NO 12  
CHARACTERIZATION SAMPLING POINTS



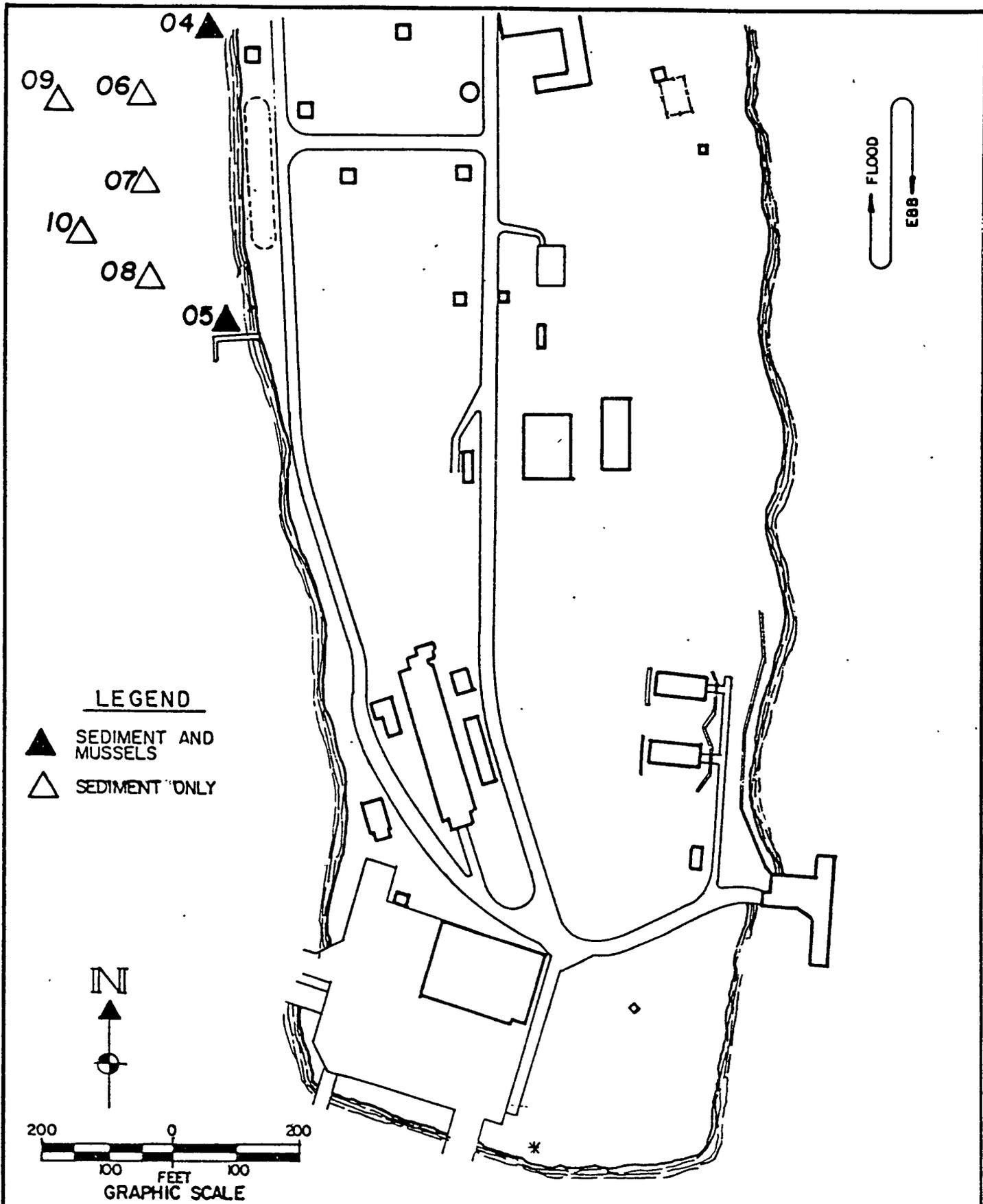
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FIG. NO. 13



**LEGEND**

▲ SEDIMENT AND MUSSELS

△ SEDIMENT ONLY

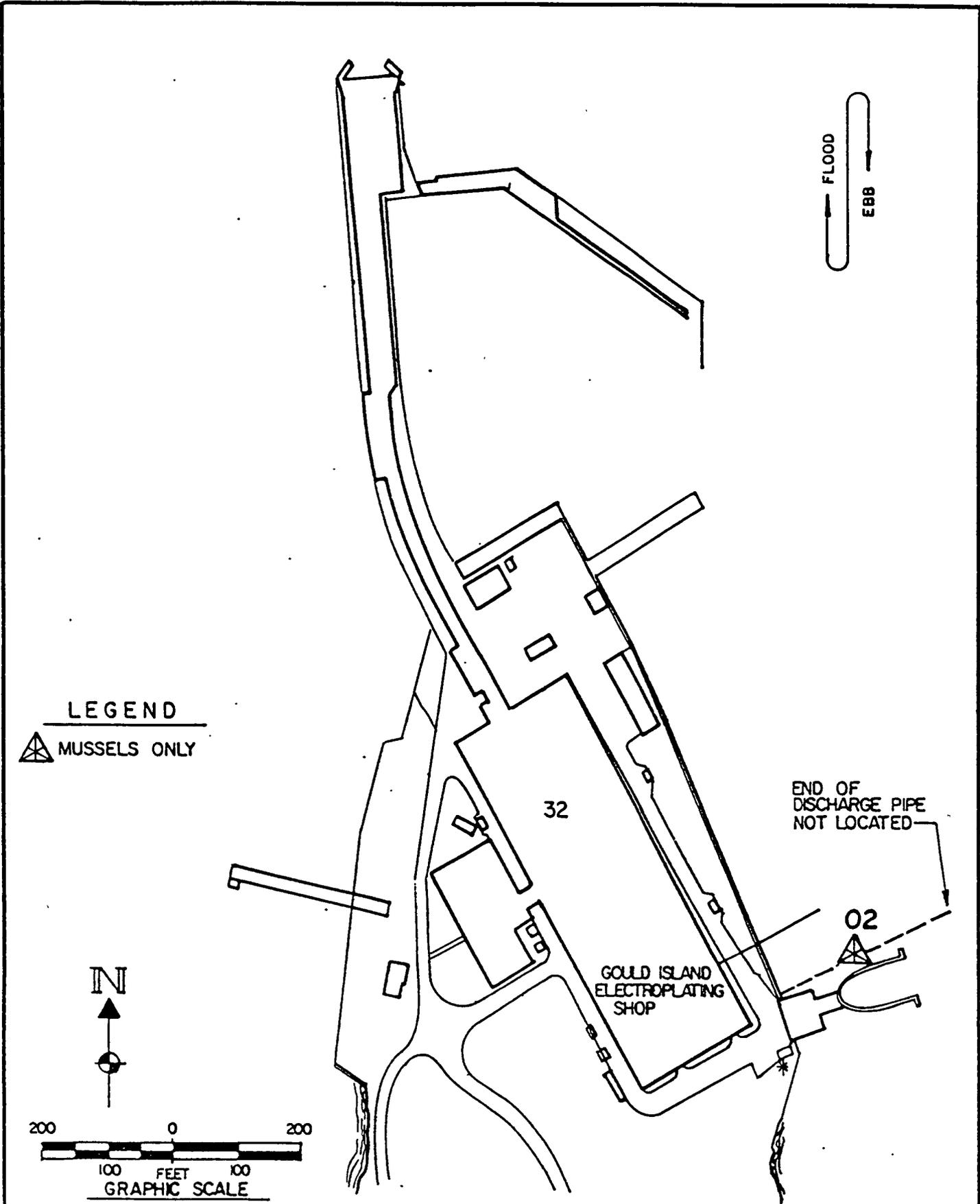
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NEWPORT NAVAL EDUCATION &  
TRAINING CENTER**

**GOULD ISLAND DISPOSAL AREA  
SITE NO 14  
CHARACTERIZATION SAMPLING POINTS**

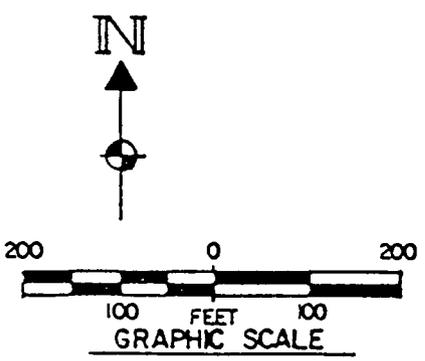
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FIG. NO. 15



**LEGEND**  
 ▲ MUSSELS ONLY



CONFIRMATION STUDY  
 ON HAZARDOUS WASTE SITES  
 NEWPORT NAVAL EDUCATION &  
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**GOULD ISLAND ELECTROPLATING SHOP  
 SITE NO 17  
 CHARACTERIZATION SAMPLING POINTS**

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**FIG NO. 17**