

U.S. NAVY
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION
WILLOW GROVE, PA

DECISION DOCUMENT
for
NO-FURTHER ACTION AT
SITES 4, 6, 8, AND 9

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June 14, 1991

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EXECUTIVE SUMMARY

Under Navy's Installation Restoration (IR) Program, the following four sites at Naval Air Station, Willow Grove, Pennsylvania were investigated to verify the presence of contamination at the suspected site or to provide the basis for eliminating the site from the IR Program:

- Site 4; North End Landfill - located at the north end of Runway 15/33, was used from about 1967 to 1969 as a landfill area.
- Site 6; Abandoned Rifle Range #1 - located west of the Marine compound immediately adjacent to Horsham Road, where a rifle range had existed until 1965.
- Site 8; Building 118 Abandoned Fuel Tank - located near Bldg. 118, where an underground 500 gallon heating fuel tank was constructed in 1959.
- Site 9; Steam Plant Building No. 6, Tank - located near steam plant Bldg. 6, where a No. 2 fuel oil spill occurred in 1978.

Sites 4, 6, 8, and 9 were first reported in the Initial Assessment Study (IAS) of NAS Willow Grove (NEESA, Feb 1986). However, only Site 4 was recommended for a Site Inspection (SI) study. In March 1989, an interim report was completed as part of the SI and provided results of an Electromagnetic (EM) Survey and Soil Vapor Contamination Assessment (SVCA). The results of the SVCA indicated the absence of detectable levels of contamination at Sites 8 and 9. The Final SI Report was completed in May 1990 and addressed all IR sites which were first identified in the IAS. The current surface and subsurface soil, groundwater and surface water/sediment at Site 4 were analyzed for VOC, SVOC, Pesticides/PCB, total and dissolved metals, TOC, TPH, and total cyanide. The SI studies revealed no contaminants of concern which originate from the landfill. Site 6 was inspected for visual signs of contamination and no significant waste sources were found to be located on this site.

On the basis of these investigations and in accordance with the requirements of the IRP, CERCLA, NCP, and related laws and regulations, it is the Navy's decision that:

- (1) No further IRP-related actions are warranted at Sites 4, 6, 8, and 9. Therefore, they are immediately closed out of the IRP.

This document serves as the Administrative Record supporting the decision for no action at these sites.

SECTION 1

INTRODUCTION

This decision document summarizes the historical usage patterns and evidence of no significant contamination at Sites 4, 6, 8, and 9 at Naval Air Station, Willow Grove, Pennsylvania. Samples were collected from the surface and subsurface soil, groundwater and surface water/sediment at Site 4. The samples were analyzed for the presence of VOC, SVOC, Pesticides/PCB, total and dissolved metals, TOC, TPH, and total cyanide. Site 6 was visually inspected during the Site Investigation and nothing of concern was observed with respect to environmental impacts. A Soil Vapor Contaminant Assessment was conducted at Sites 8 and 9 to investigate the spread of gaseous-phase volatile organic compounds (VOCs) in the subsurface. Based upon these analyses and findings, no further action is recommended for Sites 4, 6, 8, and 9. Figure 1-1 shows the general location of NAS Willow Grove and Figure 1-2 shows the location of the four sites at the Station.

1.1 PROGRAM BACKGROUND

In response to the Resource Conservation and Recovery Act (RCRA) of 1976 and in anticipation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the U.S. Navy implemented the Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6, dated June 1980 (rev. DEQPPM 81-5, Dec 1981). The Navy Assessment and Control of Installation Pollutants (NACIP) Program at Navy installations and facilities were concurrently implemented. With the passage of the Superfund Amendments and Reauthorization Act (SARA) of 1986, the NACIP was renamed the Installation Restoration Program (IRP). The IRP is a multiphased investigative and remedial effort designed to identify and evaluate past disposal or spill sites, to determine the threat to the public and the environment posed by contamination ^{emanating} from these sites, and to control or ~~mitigate~~ ^{mitigate} that threat. The magnitude of contamination is quantified by analysis of appropriate soil, sediment, water, and air samples. Data from these analyses were used to assess potential human health and environmental risks. The IRP was originally developed and implemented as follows:

- Phase I - Initial Assessment Study (IAS)
- Phase II - Confirmation Studies (staged effort)
- Phase III - Technology Development (optional)
- Phase IV - Planning and Implementation of Appropriate Remedial Actions

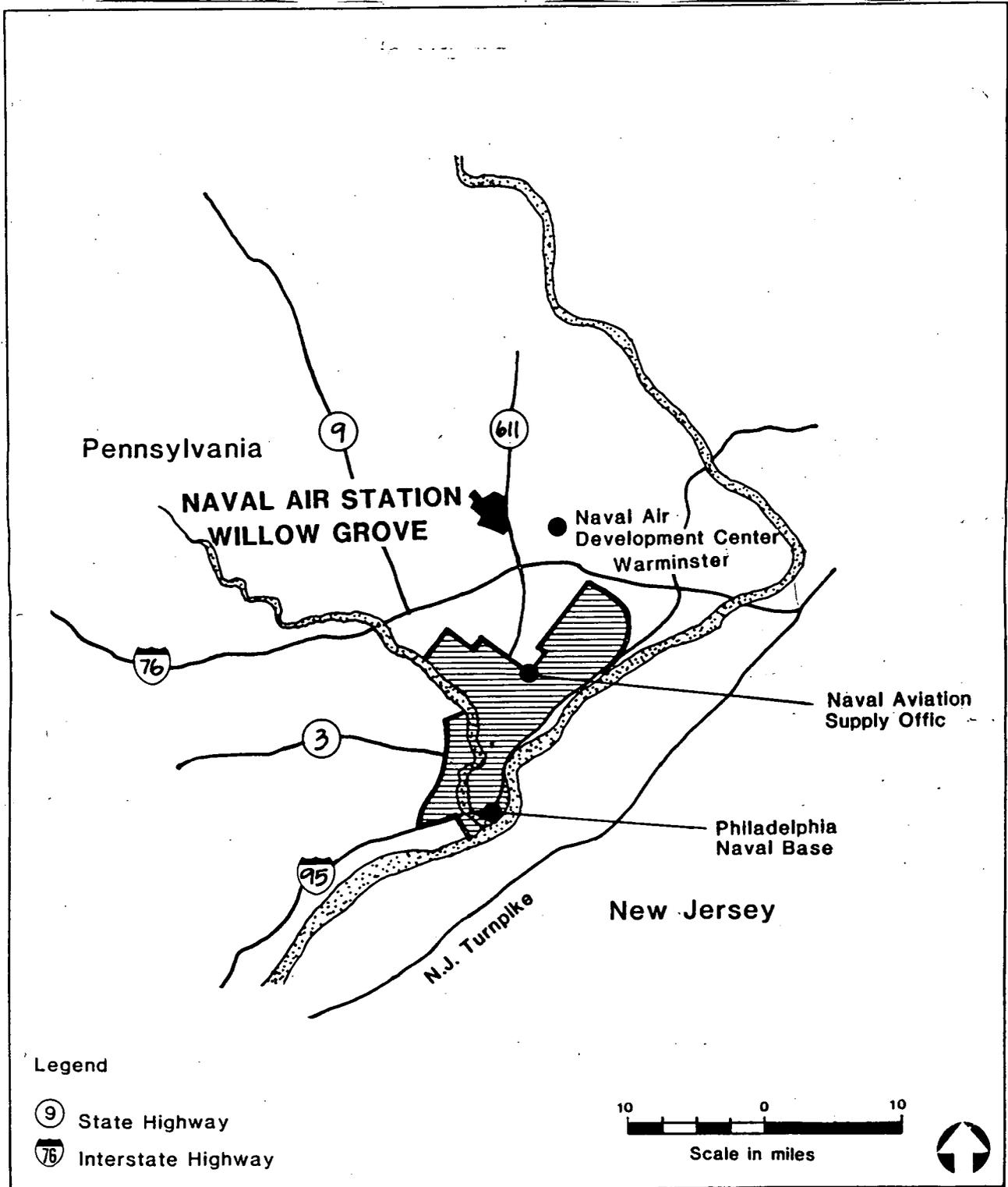


Figure 1-1
 General Location Map,
 NAS Willow Grove



Initial Assessment Study
 Naval Air Station
 Willow Grove, Pennsylvania

This four-phased approach to the IRP has been changed to ensure procedural consistency between the IRP and CERCLA and the National Contingency Plan (NCP). The new IRP terminology and phases are as follows:

- PA/SI - Preliminary Assessment/Site Inspection
- RI/FS - Remedial Investigation/Feasibility Study
- RD/RA - Remedial Design/Remedial Action

1.2 SITE DESCRIPTIONS

NAS Willow Grove is located in southeastern Pennsylvania, approximately 25 miles north of Philadelphia by road. NAS Willow Grove comprises about 1,000 acres of flat to slightly rolling terrain in Horsham Township. It lies in the east-central portion of Montgomery County, immediately adjacent to Bucks County (Figure 1-1).

Four locations (Sites 4, 6, 8, and 9) at NAS Willow Grove have shown signs of suspected contamination. Figure 1-2 shows the location of these sites.

1.2.1 Site 4 - North End Landfill

Site 4 is located at the north end of Runway 15/33. The North End Landfill occupies approximately 3.5 acres and was active from about 1967 until 1969. During this time, it apparently received waste materials that were not accepted by the regular trash pickup and disposal service that was instituted in 1967. The site is believed to have been used primarily to dispose of overflow from the Privet Road Compound, at that time an open disposal area. The refuse was disposed in an irregular area that extends northward from the steep berm at the northern end of the runway.

1.2.2 Site 6 - Abandoned Rifle Range #1

Site 6 is located 100 yards west of the present location of the Marine Reserve Compound and immediately adjacent to Horsham Road. Abandoned Rifle Range #1 was constructed when the activity was commissioned in 1942. The earth rampart for the range occupied approximately one acre. The range is shown on development maps of the activity for 1942 and 1953. An accurate date for the demolition of the range is not available. However, it was certainly demolished by 1965, when a new range was constructed at the end of the expanded runway.

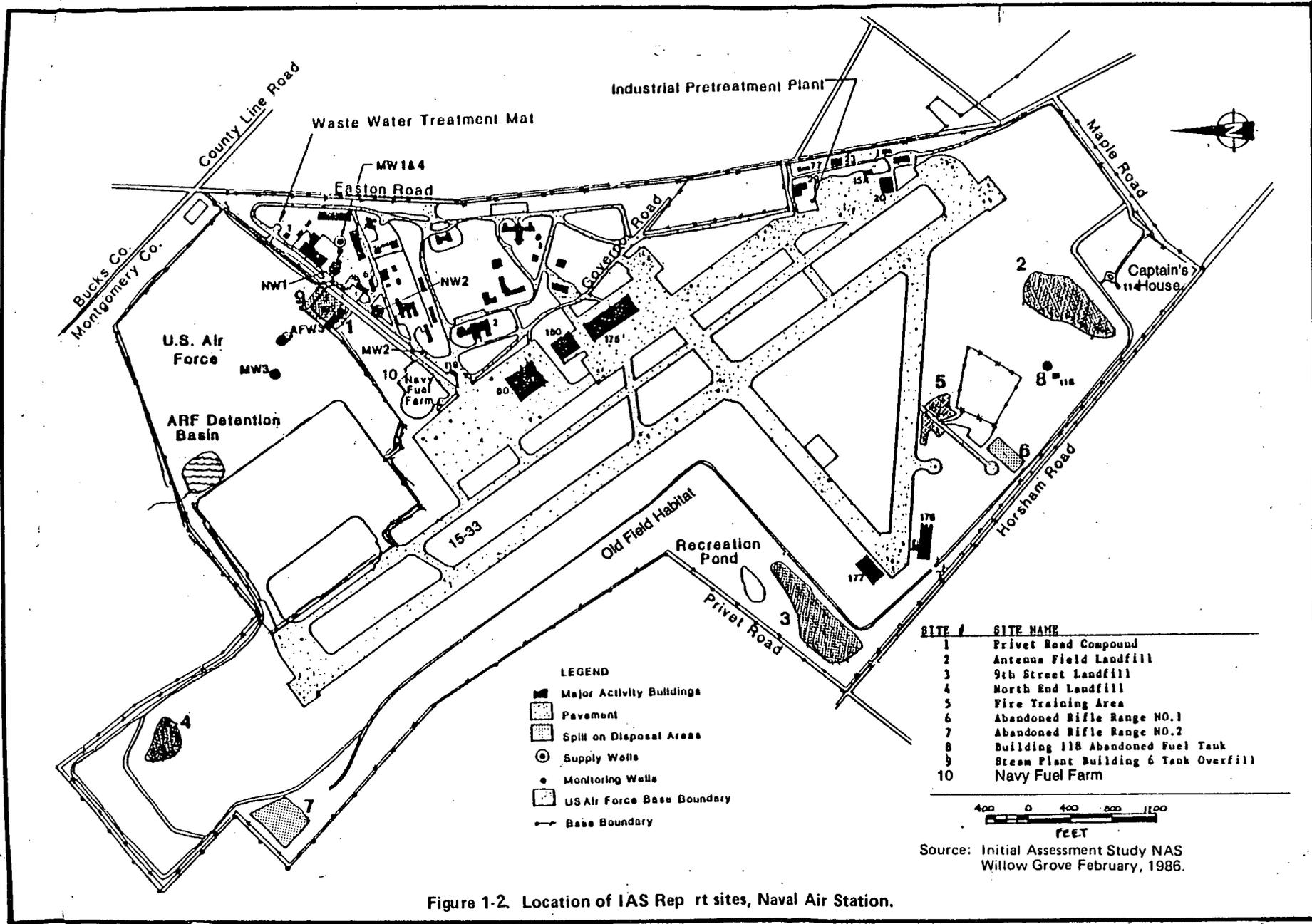


Figure 1-2. Location of IAS Report sites, Naval Air Station.

1.2.3 Site 8 - Building 118 Abandoned Fuel Tank

Site 8 is located approximately 50 ft northeast of the eastern corner of Building 118, where an underground 500 gallon heating fuel tank was constructed in 1959. In 1978 or 1979, the tank required maintenance. Drainage of water out of the tank was required on an approximately biweekly schedule for the next 6-12 months, when it was decided that the problem was a chronic one which would not improve. In 1980, a standard 290-gal above-ground tank was installed outside the building and the buried 500-gal tank was abandoned in place.

1.2.4 Site 9 - Steam Plant Building 6, Tank Overfill

Site 9 is located in the area of the tanks between the steam plant (Bldg. No. 6) and the tanks. In 1978, a supplier preparing to deliver a load of fuel oil mistakenly hooked up to a full tank. The supplier left the truck unattended, and the fuel backed up through the vent/breather pipe of the tank and spilled between 3,000 to 5,000 gal of No. 2 fuel oil on the ground.

SECTION 2

REVIEW OF EXISTING DATA

In this section, the data collected and analyzed during the SI effort is reviewed and summarized for each of the four sites. The reader is referred to the Final Site Inspection Study (EA Engineering, May 1990), the Interim Report Electromagnetic Survey, Soil Vapor Contaminant Assessment, and Revised Field Sampling Plan for Site Inspection Studies (EA, March 1989), and the Initial Assessment Study (NEESA, Feb 1986) for a full description of the data summarized here.

2.1 SUMMARY OF ANALYTICAL RESULTS

2.1.1 Site 4 - North End Landfill

Previous Investigations: In 1989, EA Engineering, Science, and Technology, Inc. performed the Site Inspection (SI) fieldwork at the North End Landfill. Three 4-inch monitoring wells were installed at the site. See Figure 2-1. The upgradient well, NELW-1, was installed within the fill associated with the extension of Runway 15. All wells were sampled in June, September, and December of that year. Ground-water samples were analyzed for VOC, SVOC, Pesticides/PCB, total and dissolved metals, TOC, TPH, and total cyanide.

Three surface water samples were collected from the outfall, marsh, and associated stream that borders the west side of the site during each ground-water sampling event except in December when surface water at the site was frozen. Sediment samples were collected from the marsh and stream sites at the same time as the surface water samples. All samples were analyzed as ground water with the exception of dissolved metals.

Two surficial soil samples were collected with a hand auger from a black tarry area in the northwest section of the site. The soil samples were taken from the 0-0.5 ft and 2-2.5 ft depth intervals at the same location. Surficial soil samples were analyzed as above.

The overburden at the site is primarily composed of sandy silt overlying interbedded red and tan sandstone. Between 5 and 10 ft of surficial fill is present near wells NELW-1 and NELW-2 as a result of road building and extension of Runway 15. Drilling at NELW-3 encountered 4 ft of silt and clay deposits at the surface which reflect the intermittent flooding and marsh conditions typical of this part of the site.

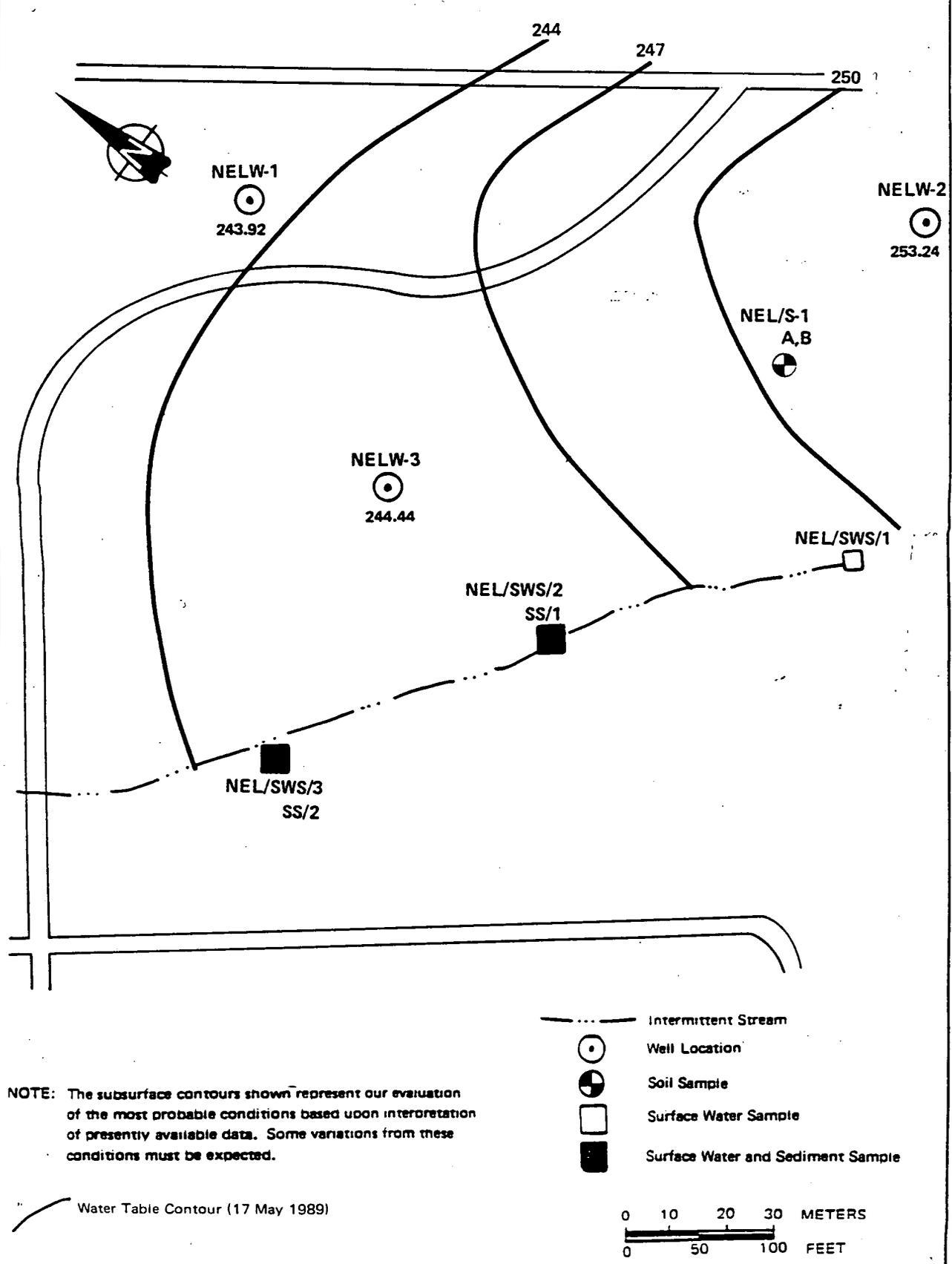
Depth to water at the site varies from 10 to 17 ft below grade with the shallowest depths present at NELW-3. Water level data suggest that ground-water flow is to the northeast.

Discussion: Dieldrin was detected at similar levels in surface water samples and the sample from well NELW-3, which is in the flood prone area. Since dieldrin was not detected in either the upgradient or downgradient well outside the flood prone area, it can be inferred that surface water infiltration near the well during a flood event is a source of dieldrin.

The absence of lighter VOC and the presence of xylene and PAH in the surficial soil sample suggests a degraded tar or asphalt. The extent of this contamination appears to be limited.

Conclusions: Dieldrin was detected at various times in ground water (NELW-3), surface water (0.061J-0.081J ug/L), and sediment (140-230 ug/kg). Its concentration was not consistent in space or time, and is likely related to stormwater runoff events.

The surficial soil samples taken in the observed black tarry mass confirmed the presence of a degraded hydrocarbon source, but the concentrations of VOC and SVOC in the deeper sample indicate that little downward movement of contaminants has occurred. Healthy-looking grasses were observed to be growing directly out of the black tarry area.



NOTE: The subsurface contours shown represent our evaluation of the most probable conditions based upon interpretation of presently available data. Some variations from these conditions must be expected.

Water Table Contour (17 May 1989)

Figure 2-1. NAS Site 4, North End Landfill site plan.

2.1.2 Site 6 - Abandoned Rifle Range #1

Previous Investigations: In 1989, EA Engineering, Science, and Technology, Inc. visually inspected Site 6 during the Site Investigation and nothing of concern was observed with respect to environmental impacts.

Discussion: There is no information available relating to how the rifle range was operated; therefore, it has been assumed that it was operated in a manner similar to the range that replaced it. Provisions for removing lead from the earth rampart were probably not included, so there is good reason to assume that the lead was distributed in the vicinity of the site, along with the earth from the rampart, when the site was regraded.

The current rifle and pistol range is presently located inside Building 176 in the Army Reserve Compound. Lead is removed from this range by a contractor at the rate of 15 lb per year. If the rate of lead accumulation has remained constant, approximately 345 lb of lead may remain at the site.

The only viable mechanism for contaminant transport at this site was considered to be the slow leaching of aqueous lead complexes from buried lead projectiles. A perched water table was indicated in this area, with minimum depth to ground water of less than 2.5 ft. However, the lead-laden earth from the rampart has been distributed on the surface and thought not to be subject to periods of saturation. Releases of lead were thought to be associated with percolation of infiltrated rainfall to the water table.

Migration of lead in the ground water will be inhibited by the formation of stable lead carbonate species. Concentrations will further be reduced by attenuation mechanisms such as adsorption on mineral surfaces and cation exchange. Although lead is sparingly soluble in the mildly acidic conditions prevailing in the soil, its solubility is much lower in the alkaline environment that characterizes ground water of the Stockton Formation. Lead mobilized from the soil zone will reprecipitate as lead carbonate once the water table is encountered. At pHs exceeding 7.0, the concentration of dissolved lead should not exceed 0.05 mg/L. At higher pHs, the lead concentrations drop off rapidly. Concentrations will be further reduced by attenuation mechanisms such as adsorption on mineral surfaces and cation exchange. On the basis of the combined effects of low solubility of lead in ground water and the attenuation of lead concentrations, it was determined that lead release to the environment at this site is negligible.

Conclusions: Based on the IAS findings and the EA site visit, no significant waste sources are located at this site.

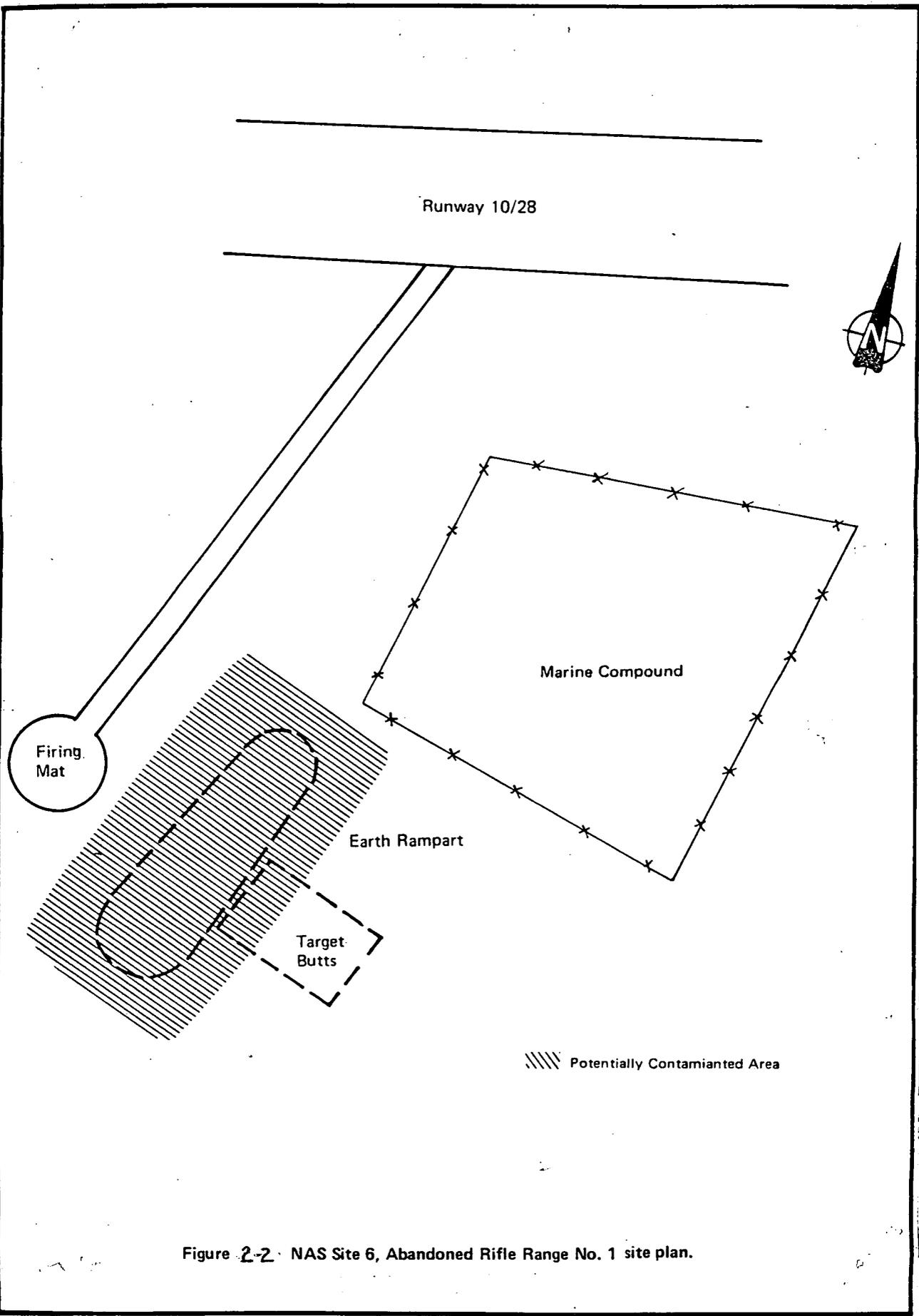


Figure 2-2. NAS Site 6, Abandoned Rifle Range No. 1 site plan.

2.1.3 Site 8 - Building 118 Abandoned Fuel Tank

Previous Investigations: In 1989, EA Engineering, Science, and Technology, Inc. performed a Soil Vapor Contamination Assessment (SVCA) at the abandoned underground fuel tank near Building 118. Results are presented in Table 2-1. Soil vapor samples obtained at the locations shown on Figure 2-2 were analyzed for volatile organic hydrocarbon compounds.

Discussion: Contaminant concentrations in the soil vapor for benzene, toluene, ethylbenzene and xylenes, and p-ethyltoluene were below the detection limits of these target compounds. Contaminant concentrations for the sum of the unknown compounds eluting prior to benzene and the sum of the unknown compounds eluting after p-ethyltoluene were also below the detection limits. Due to the fact that no significant volatile hydrocarbon contamination was detected in the soil vapor, contamination levels were not plotted on maps of the vicinity of the abandoned underground fuel tank. Soil vapor samples were unable to be obtained at approximately 50 percent of the sampling probes placed in the ground. This is directly related to the low porosity of soil in the immediate area. However, an adequate number of soil vapor samples were obtained which provided enough information to confidently assess the suspected contamination at the site.

Conclusions: The results of the SVCA indicate the absence of detectable levels of contamination.

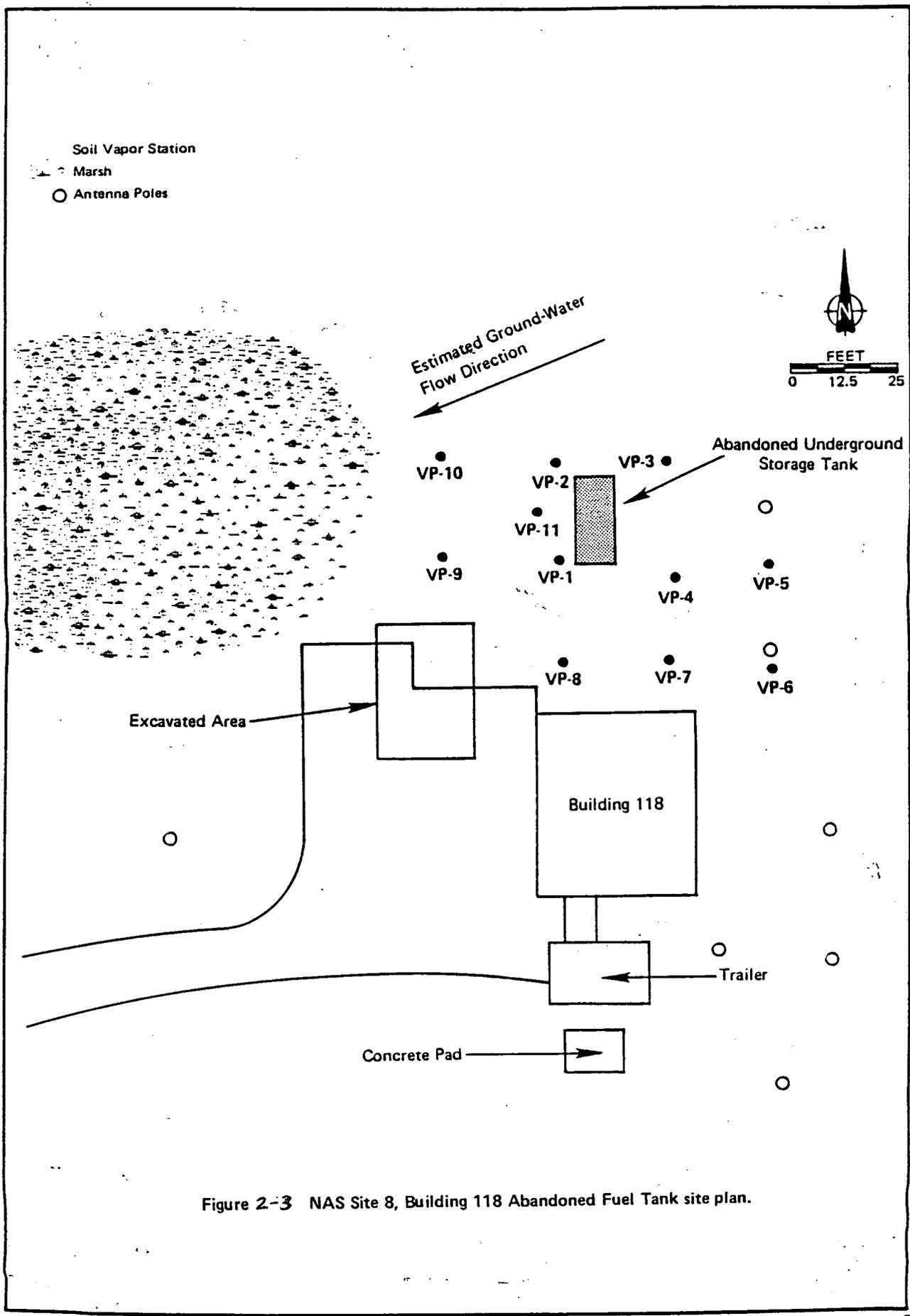


Figure 2-3 NAS Site 8, Building 118 Abandoned Fuel Tank site plan.

Table 2-1

Hydrocarbon Concentrations in the Soil Vapor
at Building 118 Abandoned Fuel Tank

Sample	Depth (ft)	Sum of the Compounds Eluting Prior to Benzene (as ppm toluene equivalent)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene and Xylenes (ppm)	p-Ethyl-toluene (ppm)	Sum of the Compounds Eluting post p-ethyltoluene (area/ml x 10 ⁻⁵)
VP-1	3	NO VAPORS, NO SAMPLE					
VP-1	6	NO VAPORS, NO SAMPLE					
VP-1	9	NO VAPORS, NO SAMPLE					
VP-2	3	NO VAPORS, NO SAMPLE					
VP-2	6	NO VAPORS, NO SAMPLE					
VP-3	3	NO VAPORS, NO SAMPLE					
VP-3	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-4	3	NO VAPORS, NO SAMPLE					
VP-4	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-5	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-5(a)	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-6	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-7	6	NO VAPORS, NO SAMPLE					
VP-7	9	NO VAPORS, NO SAMPLE					
VP-8	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-9	3	NO VAPORS, NO SAMPLE					
VP-9	6	NO VAPORS, NO SAMPLE					
VP-10	3	NO VAPORS, NO SAMPLE					
VP-10	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-11	6	NO VAPORS, NO SAMPLE					

(a) Duplicate Sample.

2.1.4 Site 9 - Steam Plant Building No. 6, Tank

Previous Investigations: In 1989, EA Engineering, Science, and Technology performed a Soil Vapor Contamination Assessment (SVCA) at the steam plant. Results are presented in Table 2-2. Soil vapor samples obtained at the locations shown on Figure 2-3 were analyzed for volatile organic hydrocarbon compounds.

Discussion: Contaminant concentration in the soil vapor for benzene, toluene, ethylbenzene and xylenes, and p-ethyltoluene were below the detection limits of these compounds. Contaminant concentrations for the sum of the unknown compounds eluting prior to benzene and the sum of the unknown compounds eluting after p-ethyltoluene were also below the detection limits. Due to the fact that no significant volatile hydrocarbon contamination was detected in the soil vapor, contamination levels were not plotted on maps of the steam plant area. The SVCA data indicates no significant volatile organic hydrocarbon contamination at the tank overflow site.

Conclusions: The results of the SVCA indicate the absence of detectable levels of contamination.

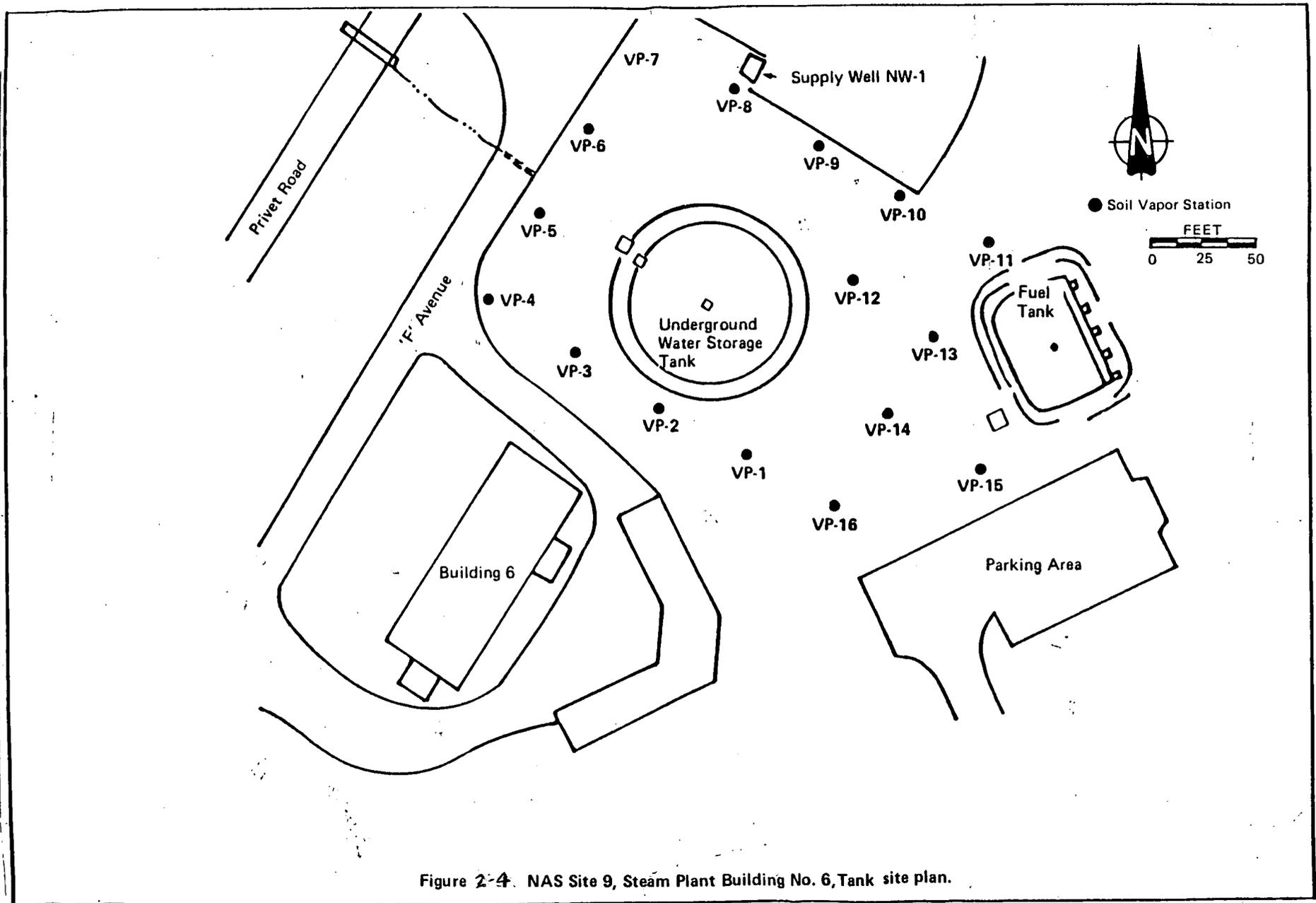


Figure 2-4. NAS Site 9, Steam Plant Building No. 6, Tank site plan.

Table 2-2

Hydrocarbon Concentrations in the Soil Vapor
at the Steam Plant, NAS Willow Grove

Sample	Depth (ft)	Sum of the Compounds Eluting Prior to Benzene (as ppm toluene equivalent)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene and Xylenes (ppm)	p-Ethyl- toluene (ppm)	Sum of the Compounds Eluting post p-ethyltoluene (area/ml x 10 ⁵)
VP-1	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-2	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-2(a)	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-3	6	NO VAPORS, NO SAMPLE					
VP-3	9	<1	<0.5	<0.5	<0.5	<1	<1
VP-4(b)	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-5	6	NO VAPORS, NO SAMPLE					
VP-6	6	WATER, NO SAMPLE					
VP-7	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-8	6	NO VAPORS, NO SAMPLE					
VP-8	9	<1	<0.5	<0.5	<0.5	<1	<1
VP-9	6	WATER, NO SAMPLE					
VP-10(b)	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-11	3	NO VAPORS, NO SAMPLE					
VP-11	6	NO VAPORS, NO SAMPLE					
VP-11	9	<1	<0.5	<0.5	<0.5	<1	<1
VP-11(a)	9	<1	<0.5	<0.5	<0.5	<1	<1
VP-12	3	NO VAPORS, NO SAMPLE					
VP-12	6	NO VAPORS, NO SAMPLE					
VP-12	9	<1	<0.5	<0.5	<0.5	<1	<1
VP-13	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-14	6	<1	<0.5	<0.5	<0.5	<1	<1
VP-15	6	NO VAPORS, NO SAMPLE					
VP-15	9	<1	<0.5	<0.5	<0.5	<1	<1
VP-16	6	NO VAPORS, NO SAMPLE					
VP-16	9	<1	<0.5	<0.5	<0.5	<1	<1

(a) Duplicate Sample.

(b) Probe refusal at depth indicated.

SECTION 3

FINDINGS AND DECISIONS

Four sites (identified as 4, 6, 8, and 9) at Naval Air Station, Willow Grove, PA were investigated in accordance with the requirements of the Navy Installation Restoration Program (IRP).

This Decision Document provides summary descriptions of the sites and investigations performed. Based on the findings of the Final Site Investigation Report of May 1990 described herein, the Navy has decided to take the following response action for these sites:

- (1) No further IRP-related actions are warranted at Sites 4, 6, 8, and 9. Therefore, they are immediately closed out of the IRP.

In making this decision, it is the Navy's opinion that it has compiled procedurally and substantively with all applicable or relevant and appropriate requirements of the IRP, CERCLA Section 120, NCP, and associated laws, guidelines, rules, regulations, and criteria.

SECTION 4

REFERENCES

EA Engineering, Science, and Technology, Inc. "Final Report, Site Inspection Studies", May 1990. Prepared for Northern Division, Naval Facilities Engineering Command, Philadelphia, PA.

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