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CNC CHARLESTON
5090.3a

CONTAMINATION ASSESSMENT REPORT FOR UNDERGROUND STORAGE TANK 708
(UST 708) CNC CHARLESTON SC
05/22/1998
ENVIRONMENTAL DETACHMENT CHARLESTON



DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. BOX 190010
2155 EAGLE DRIVE
NORTH CHARLESTON, S.C. 29419-9010

Li 6.22.98
Lw 8.12.98

5090
Code 1849
11 June 1998

Mr. Paul Bristol
South Carolina Department of Health
And Environmental Control
Division of Underground Storage Tank
2600 Bull Street
Columbia, SC 29201

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JUN 17 1998

Water Monitoring, Assessment &
Protection Division

**CONTAMINATION ASSESSMENT REPORT FOR UST 708 (SCDHEC GWPD
SITE ID # 17665)**

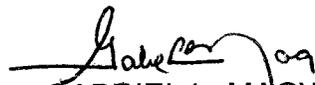
Dear Mr. Bristol:

Enclosed are two (2) copies of the Contamination Assessment Report (CAR) for the former UST 708 located at the former Charleston Naval Base, Charleston SC. The contamination assessment has been completed in accordance with SCDHEC regulations and guidelines. This report is now being submitted to SCDHEC for review and approval.

The Navy recommends No Further Action at this site.

If you have any questions regarding the CAR feel free to contact me at (843) 820-7307.

Sincerely,

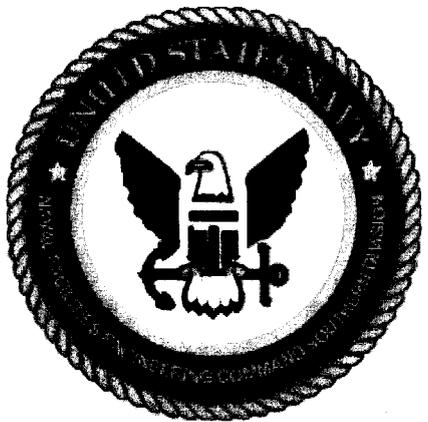

GABRIEL L. MAGWOOD
Petroleum/UST Branch

Encl:
(1) Contamination Assessment Report (CAR)



CONTAMINATION ASSESSMENT REPORT

UST 708
(SCDHEC GWPD SITE ID # 17665)
NAVAL BASE CHARLESTON
CHARLESTON SC



Prepared for:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, S.C.



Prepared by:

ENVIRONMENTAL DETACHMENT CHARLESTON
1899 NORTH HOBSON AVE.
NORTH CHARLESTON, S.C. 29405-2106

S.C. UST SITE REHABILITATION CONTRACTOR # 145

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Executive Summary

Environmental Detachment Charleston (DET) performed a Contamination Assessment (CA) for the Navy at Building 708 at the former Charleston Naval Base (NAVBASE). The CA was performed between 24 March 1998 and 25 March 1998 in response to contamination detected in soil samples taken during removal of an Underground Storage Tank (UST).

The CA field activities included advancing eight soil borings to the water table to assess the horizontal and vertical extent of potential hydrocarbon contamination in soil at the site and taking four surface soil samples from the area surrounding the former tank location to assess risk to site residents. A soil sample from each soil boring and the surface soil samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAHs) and Benzene, Toluene, Ethylbenzene and Xylene plus Naphthalene (BTEX + Naphthalene) Chemicals of Concern (COCs). CA field activities **did not** include activities to characterize groundwater at the site as the laboratory analysis of soil samples taken at the water table failed to detect any COC in excess of groundwater protection Risk Based Screening Levels (RBSLs) (see below).

The results of the CA field investigation indicate no threat exists to groundwater or site residents at the former UST 708 site. No COCs were detected above groundwater protection RBSLs in soil boring samples. In surface soil samples, analysis detected no COCs in concentrations exceeding residential soil ingestion RBSLs. COCs exceeding residential soil ingestion RBSLs were detected in a soil boring sample taken from shallow subsurface soil in an area capped by a concrete driveway.

Based on the findings of the CA of the former UST 708 site, the Navy recommends no further action for this site

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LIST OF ACRONYMS AND ABBREVIATIONS

bgs	below the ground surface
BTEX+Naphthalene	Benzene, Toluene, Ethylbenzene and Xylene plus Naphthalene
CA	Contamination Assessment
CIA	Controlled Industrial Area
COC	Chemical of Concern
CSAP	RFI Final Comprehensive Sampling and Analysis Plan
DET	Environmental Detachment Charleston
DL	Detection Levels
FID	flame ionization detector
ft/day	feet per day
ft ² /day	square feet per day
gpm	gallons per minute
GWPD	Ground Water Protection Division
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
NAVBASE	former Charleston Naval Base
OVA	organic vapor analyzer
PAH	Polynuclear Aromatic Hydrocarbon
PPM	parts per million
RBC	Risk Based Concentration
RBCA	Risk-Based Corrective Action for Petroleum Releases
RBSL	Risk Based Screening Level
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SCAP	Soil Corrective Action Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SDWA	Safe Drinking Water Act
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SSL	Soil Screening Level
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank

1.0 INTRODUCTION

DET removed an UST at Building 708 at the NAVBASE. Soil samples taken during UST removal contained contamination requiring further investigation. Southern Division Naval Facilities Engineering Command (SOUTHDIIV) requested the DET to prepare a Sampling and Analysis Plan (SAP) to investigate the site for the U. S. Navy. This Contamination Assessment Report presents the findings and recommendations of the investigation to the South Carolina Department of Health and Environmental Control (SCDHEC) for review and approval.

1.1 PURPOSE. A field investigation was performed between 24 March 1998 and 25 March 1998 at the former UST 708 site to assess the horizontal and vertical extent of soil and groundwater contamination. The purpose of this report is to present the findings of this investigation and provide recommendations for remedial actions to be taken at the UST 708 site.

1.2 SITE DESCRIPTION. The NAVBASE is in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina. The developed portion of the NAVBASE occupies the west bank of the Cooper River starting at a boundary 2300 feet upstream of Noisette Creek and ending at Shipyard Creek. The northern section of the NAVBASE (Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Zones A, B, C and D) contains a mixture of warehouses, offices and former Navy housing areas. The central section of the NAVBASE (RFI Zones E and F) was occupied primarily by the controlled industrial area (CIA) of the former Naval shipyard and its associated offices and warehouses. The southern section of the NAVBASE (RFI Zones G, H and I) along the Cooper River is occupied by piers, barracks, training buildings, offices, storehouses and fuel tanks which formerly supported naval vessels homeported at Charleston. The north bank of Shipyard Creek in the southern part of the base is largely undeveloped and consists of recreational areas and a large dredge spoil area.

The former UST 708 site is in RFI Zone B in the northern portion of the NAVBASE. Zone B consists of a golf course and housing area located immediately south of Noisette Creek. Building 708 is a single family dwelling located in the western half of Zone B at 1468 Hobson Avenue. Building 708 is located on the east side of Hobson Avenue. The former UST location is in front of Building 708 beside the driveway.

1.3 SITE BACKGROUND. The UST at Building 708 (SCDHEC Ground Water Protection Division (GWPD) Site Identification No. 17665) was a 280 gallon unregulated heating oil tank installed prior to 1977 and used until April 1996. The tank was constructed of steel and connected to Building 708 by copper piping. There were no recorded releases while the tank was in service.

On 3 June 1996, the UST and its associated piping were removed. Residual used oil was pumped into a 55 gallon drum for recycling before the tank was removed. The tank and piping were reported to be in good condition with no visible holes or corrosion when removed. The tank was subsequently cleaned and cut up for recycling as scrap. Excavated soil was returned to the tank pit, after which the top of the excavation was filled to grade with clean fill.

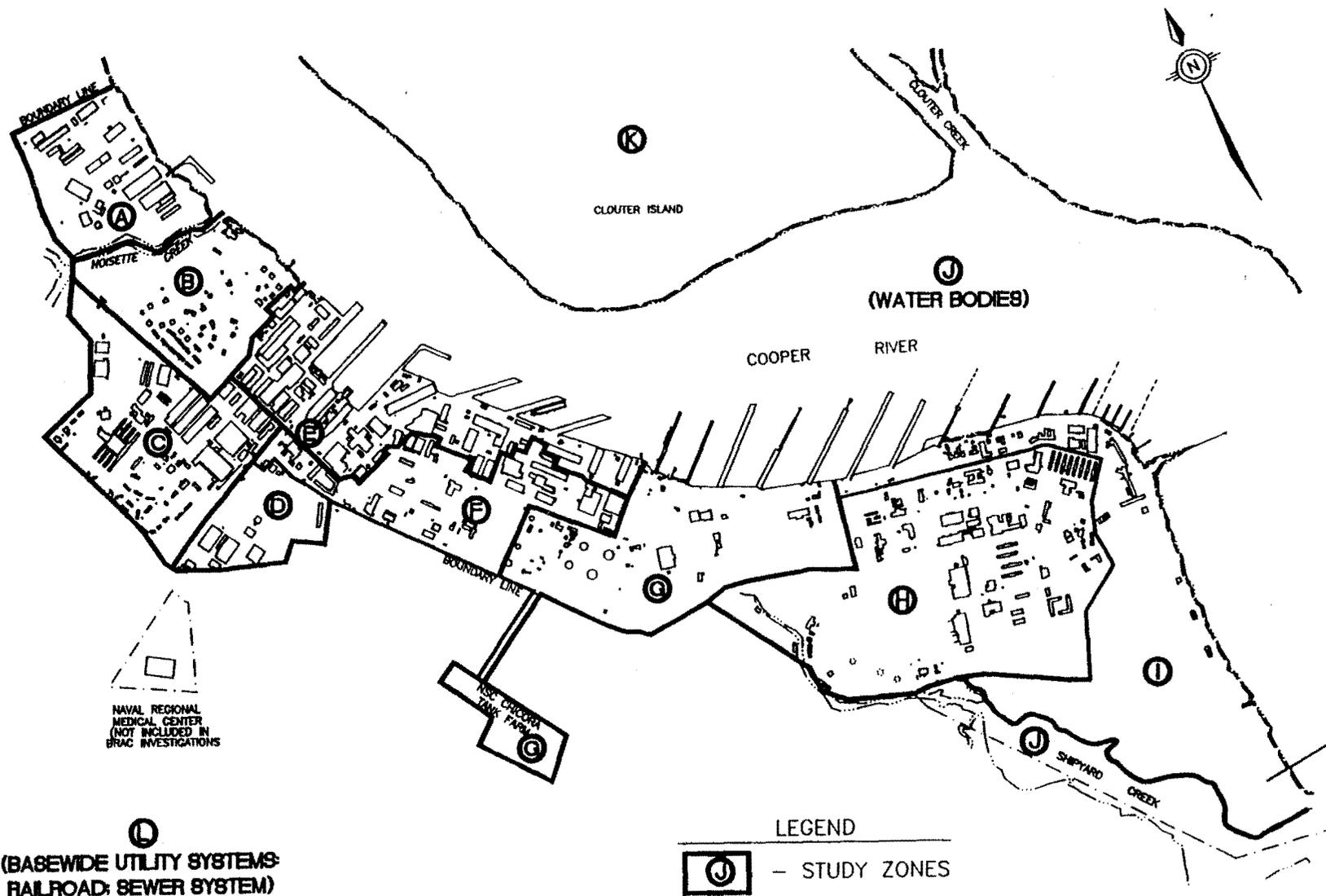
Two soil samples were taken at the base of the excavation before it was filled and analyzed for PAHs and BTEX + Naphthalene. Sample SPORT0063-1 taken at the west end of the tank contained matrix interferences, which elevated detection levels (DLs) for PAHs above SCDHEC RBSLs for Benzo(b)fluoranthene and Chrysene. Sample SPORT0063-2 contained concentrations of PAHs less than RBSLs. See Figure 1-3.

No groundwater was encountered while removing UST 708.

1.4 SCREENING LEVELS FOR SOIL AND GROUNDWATER Where provided, RBSLs from Appendix B of the SCDHEC Risk-Based Corrective Action for Petroleum Releases (RBCA) dated June 20, 1997 were used in the preparation of this report. For COCs not listed in the RBCA, the screening levels below were used. For COC transfer from soil to groundwater, in accordance with SCDHEC correspondence dated September 2, 1997 (Paul Bristol to J. T. Amey), groundwater protection Soil Screening Levels (SSLs) from the Soil Corrective Action Plan (SCAP) dated January 28, 1997 were used for COCs not listed in Table B3, Appendix B of the RBCA. For ingestion of or dermal contact with surface soil at residential sites, residential soil ingestion Risk Based Concentrations (RBCs) from the United States Environmental Protection Agency (USEPA) Region III RBC Table dated September 23, 1996 were used as screening level for COCs not listed in Table B6, Appendix B of the RBCA. For Groundwater COCs not listed in Table B1 of the RBCA, Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) were used as screening levels for COCs listed in the SDWA, and Tap Water RBCs from the SCAP were used as screening levels for COCs not listed in either the RBCA or SDWA.

1.5 USE OF RFI DATA The NAVBASE is the site of an ongoing RFI; the UST 708 location is in Zone B of the RFI. Data taken as part of the RFI, including geological information, hydrogeological information, well drilling logs and groundwater sampling data was used in the preparation of this report.

1.6 INITIAL ABATEMENT AND INTERIM REMEDIAL ACTION. No initial abatement or interim remedial actions were taken at the UST 708 site.



NAVAL REGIONAL
MEDICAL CENTER
(NOT INCLUDED IN
BRAC INVESTIGATIONS)

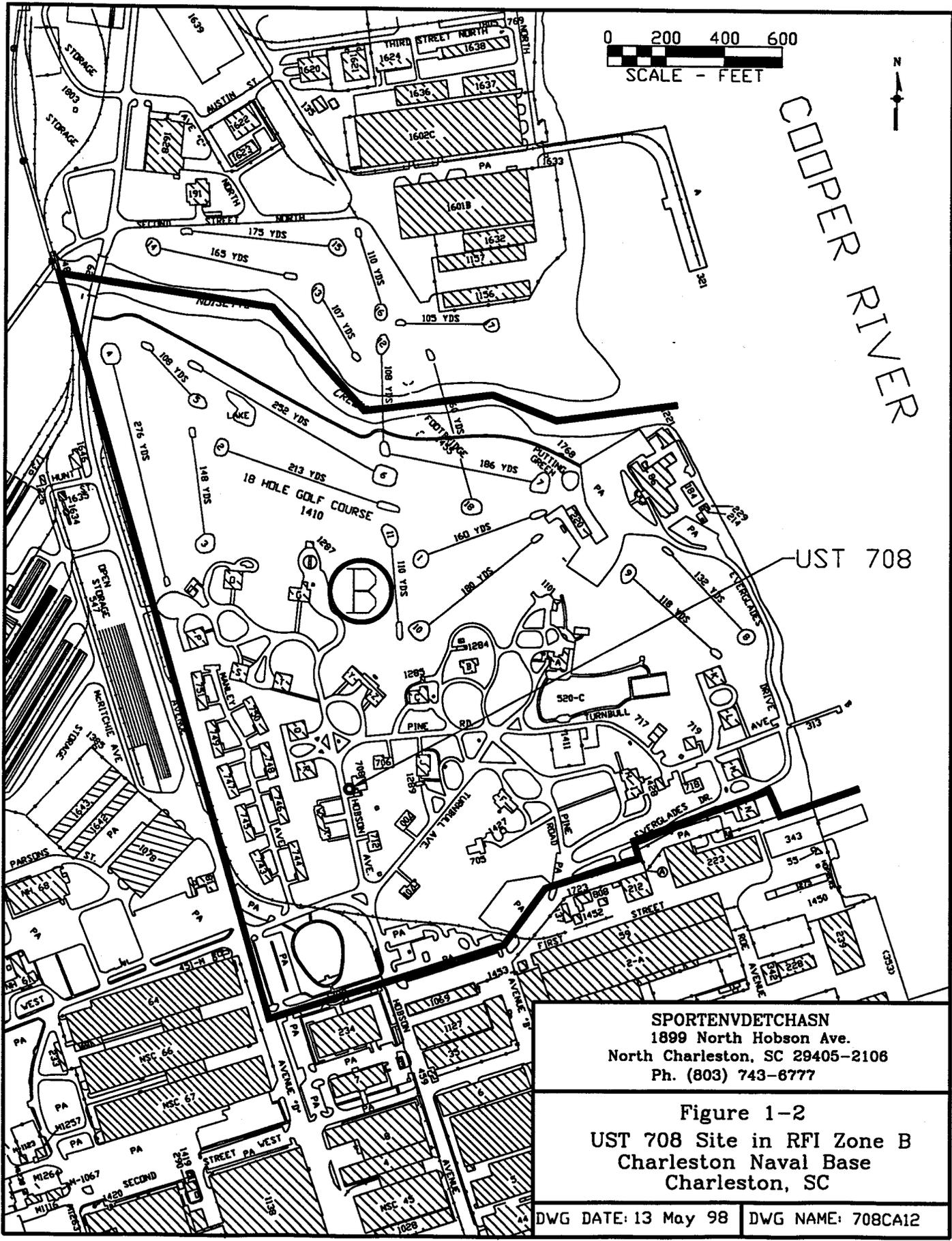
Ⓛ
(BASEWIDE UTILITY SYSTEMS:
RAILROAD; SEWER SYSTEM)

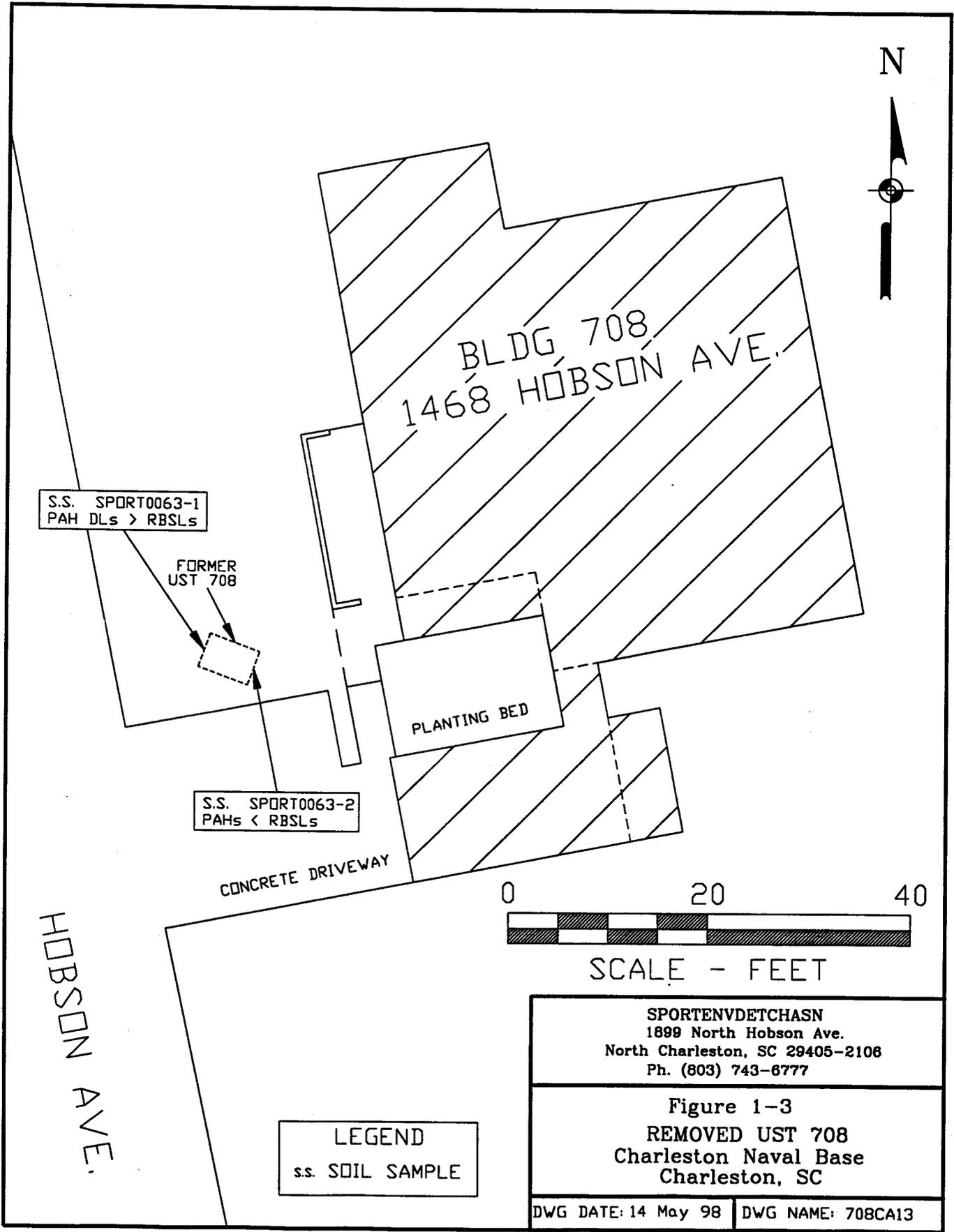
LEGEND
Ⓛ - STUDY ZONES

2000 0 2000
SCALE FEET

Figure 1-1
RFI Zone Boundaries
Charleston Naval Base
Charleston, SC

SPORTENVDETHASN 1899 North Hobson Avenue North Charleston, SC 29405-2106	
DWG DATE: 13 May 98	DWG NAME: ALLCA11





S.S. SPORT0063-1
PAH DLs > RBSLs

FORMER
UST 708

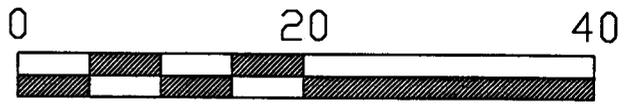
S.S. SPORT0063-2
PAHs < RBSLs

BLDG 708
1468 HOBSON AVE.

PLANTING BED

CONCRETE DRIVEWAY

HOBSON AVE.



SCALE - FEET

LEGEND
s.s. SOIL SAMPLE

SPORTENVDETHASN
1899 North Hobson Ave.
North Charleston, SC 29405-2108
Ph. (803) 743-6777

Figure 1-3
REMOVED UST 708
Charleston Naval Base
Charleston, SC

DWG DATE: 14 May 98 | DWG NAME: 708CA13

2.0 SITE GEOLOGY AND HYDROGEOLOGY

2.1 GEOLOGY. Based on information provided in the Draft Zone I RCRA Facility Investigation Report, NAVBASE Charleston, dated January 1996, Charleston South Carolina is located in the southern Atlantic Coastal Plain. The surficial geology of the region consists of the Quaternary-age sands, silts and clays of the Wando Formation. Below the Wando Formation are the Oligocene-age Ashley Formation and the Eocene-age Parkers Ferry and Harleyville Formations, known collectively as the Cooper Group. Below the Cooper Group is the Eocene-age Santee Limestone.

At the NAVBASE, the upper surface of the Ashley Formation is an erosional surface ranging from 35 feet to 77 feet below the ground surface (bgs). Overlaying the Ashley Formation is the Wando Formation which at the NAVBASE typically consists of upper and lower sand layers divided by a layer of "marsh clay". The surface contours of the NAVBASE area were extensively changed by fill operations during the base's life, particularly in the lower portion of the NAVBASE, which was originally tidal marsh.

2.2 HYDROGEOLOGY.

2.2.1 Regional. (Excerpted from Ensafe/Allen & Hoshall, Draft Zone I RCRA Facility Investigation Report NAVBASE Charleston dated January 1996.) Groundwater occurs under water table or poorly confined conditions within the Pleistocene deposits overlying the Ashley Formation. Transmissivities in the Pleistocene aquifer are generally less than 1,000 square feet per day (ft²/day) and well yield are variable, ranging from 0 to 200 gallons per minute (gpm). This groundwater contains high concentrations of iron and is commonly acidic at shallow depth (Park, 1985).

The Cooper Group is hydrogeologically significant mainly because of its low permeability. In most locales, its sandy, finely granular limestones produce little or no water and act as confining material that produces artesian condition in the underlying Santee Limestone.

2.2.2 Site Specific. From lithologic cross-sections in the Zone B RFI Report dated November 21, 1996, above the Ashley Formation in Zone B are two sand layers divided by a clay layer described as "marsh clay" in the RFI Reports. (Vertical hydraulic conductivity of the Ashley Formation beneath the NAVBASE was measured as 0.0027 feet per day (ft/day) during the Zone H RFI and the vertical hydraulic conductivity of the marsh clay layer was measured as 0.001 ft/day during the Zone I RFI.) The Ashley Formation acts as a lower confining layer, while the marsh clay functions as an aquitard separating the upper and lower sand layers. At the NAVBASE, rainwater absorbed into the ground will flow downward to the marsh clay and then flow toward a discharge point into a body of surface water.

The former Building 708 UST site is located approximately 1550 feet from the Cooper River. Based on potentiometric maps included in the final Zone B RFI Report dated November 21, 1996, ground water in the surficial aquifer beneath the former UST location flows in a southeast direction.

2.3 SURFACE HYDROGEOLOGY. Parts of the southern portion of NAVBASE are drained by Shipyard Creek while some northern areas are drained by Noisette Creek. The drainage basins of both waterways include areas other than NAVBASE. These waterways are tributaries of the Cooper River. Surface drainage over the remainder of NAVBASE flows directly into the Cooper River, which discharges into Charleston Harbor. Surface drainage at the former UST 708 site is onto Hobson Avenue, which carries water to a storm drain emptying into the Cooper River.

3.0 CONTAMINATION ASSESSMENT ACTIVITIES

3.1 SOIL SAMPLE COLLECTION PROGRAMS

3.1.1 Soil Boring Program. A soil boring program was performed at Quarters Building 708 to assess the horizontal and vertical extent of hydrocarbon contamination in the vadose zone at the site. A total of eight soil borings were advanced toward the water table using stainless steel hand augers. Figure 3-1 shows soil boring locations.

The locations of the soil borings performed differ from those proposed in the Sampling and Analysis Plan - UST NS708 dated July 23, 1997. Soil Boring NBCT708S02 was relocated toward Hobson Avenue when a creosote timber was found near the surface at the proposed location. In addition, soil boring NBCT708S05 was terminated short of the water table when an obstruction was encountered at 5 feet bgs.

The general technical approach applied to soil borings at the UST 708 site was to collect samples from the underlying soils at 2 foot intervals. Soil samples were screened in the field by performing headspace analysis using an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). No effort was made to evaluate the possible presence of methane by utilizing a charcoal filter. The soil sample from each boring with the greatest ova headspace analysis was submitted to an analytical laboratory to determine the relative concentrations of fuel oil contaminants in the soil. Where all samples from a soil boring had a "zero" headspace analysis, the sample taken at closest to a 6 foot bgs depth (the approximate depth of the base of the removed UST and the water table) was submitted for laboratory analysis. Characterization (source area) samples were collected from a boring at the approximate location where contaminants were found during tank removal. Delineation or "clean" borings were made around a perimeter outside the suspected extent of contamination.

The OVA used to monitor soil samples was calibrated daily against a methane standard to ensure that the OVA was functioning properly.

3.1.2 Surface Soil Sampling Program Because of the current and potential future use of the site as residential, a surface soil sampling program was performed at the former UST 708 site to assess risk to site residents. A total of four surface soil samples were collected immediately outside the corners of the tank removal excavation using stainless steel hand augers.

3.1.3 Sampling Equipment Decontamination All soil sampling equipment was decontaminated before and after each use to prevent incidental cross-contamination of the soil samples. Decontamination was performed at the DET decontamination station in the former Charleston Naval Shipyard Building 25. The decontamination procedure consisted of the following steps in order: a wash with a detergent/water solution, a potable water rinse, a deionized water rinse, a rinse with pesticide grade isopropyl alcohol and a second deionized water rinse. Once decontaminated, hand augers were wrapped in aluminum foil to prevent contamination of the augers before use.

3.2 MONITORING WELL INSTALLATION PROGRAM.

The Sampling and Analysis Plan - UST NS708 dated July 23, 1997 proposed that two temporary monitoring wells be installed at the former UST 708 site. However, as the soil boring program of section 3.1.1 failed to detect any COC above groundwater protection RBSLs (see section 4.2 below), no monitoring well installation program was undertaken at the former UST 708 site.

3.3 SAMPLING AND ANALYSIS PROGRAM.

3.3.1 Soil Sampling Program Confirmatory laboratory analyses were performed on soil samples collected from the former UST 708 site to document soil quality at the site. The samples were collected between 24 March 1998 and 25 March 1998.

Sample NBCT708S040103 was a characterization (source area) sample taken from a depth of 6 feet bgs at the approximate location where contamination was detected during UST removal.

Delineation or "clean" samples were collected from seven soil borings numbered NBCT708S01 through NBCT708S03 and NBCT708S05 through NBCT708S08 surrounding the former tank location. Based on potentiometric maps contained in the Zone B RFI Report, samples NBCT708S010102 through NBCT708S030102 were collected upgradient of the former tank location and samples NBCT708S050102 through NBCT708S080102 were collected downgradient of the former tank location.

Surface soil samples were taken from sampling locations NBCT708S09 through NBCT708S12 immediately outside the corners of the UST excavation.

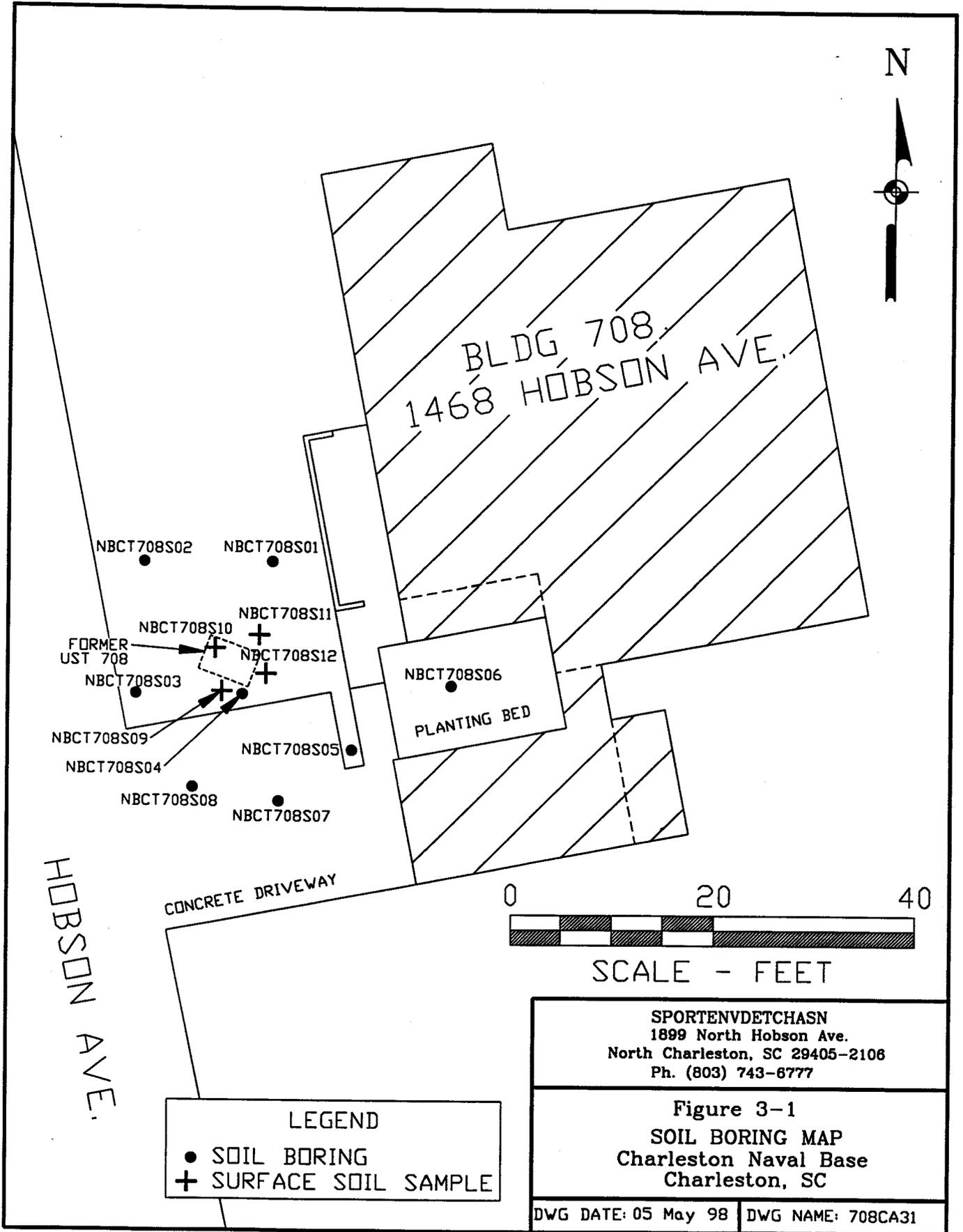
All soil samples were collected as grab samples. Samples for volatile analysis were immediately packed in appropriate laboratory containers which were then packed on ice to minimize volatilization of the potential contaminants. Samples for semivolatile analysis were immediately packed and set aside to wait headspace analysis. For each soil boring, separate samples for volatile and semivolatile analysis were collected and identified for all depth intervals before OVA headspace analysis was performed. After headspace analysis was performed and the results recorded, the samples from the interval with the greatest headspace analysis were retained, packed on ice, for laboratory analysis, with all other samples being returned to the boring from which they were taken.

Soil samples were shipped to a SCDHEC-approved laboratory for analysis. Site soil samples were handled and additional Quality Assurance/Quality Control samples prepared as required by the RFI Final Comprehensive Sampling and Analysis Plan (CSAP) dated August 30, 1994. Chain of custody records are contained in Appendix B.

Since the removed UST 708 contained fuel oil, soil samples from the soil boring program were analyzed for the parameters listed for Diesel or Kerosene in Table 1 of the RBCA. Volatile samples were analyzed for BTEX+Naphthalene; semivolatile samples were analyzed for PAHs. Samples from the surface soil sampling program were analyzed for PAHs only, on the premise that volatile COCs would have evaporated from the sandy soil in the 22 month interval (June 1996 to April 1998) between UST removal and the sampling program.

Table 3-1
 Survey Data for Soil Borings
 Quarters Building 708
 1468 Hobson Avenue
 North Charleston South Carolina

Soil Boring Number	South Carolina State Plane Coordinates		Ground Elevation (ft. msl)
	North	East	
NBCT708S01	378015.63	2316130.33	8.69
NBCT708S02	378015.59	2316117.63	7.48
NBCT708S03	378002.54	2316116.84	7.06
NBCT708S04	378002.53	2316127.45	7.96
NBCT708S05	377997.00	2316138.22	8.99
NBCT708S06	378003.44	2316147.99	9.38
NBCT708S07	377991.91	2316131.05	7.92
NBCT708S08	377993.28	2316122.55	7.06
NBCT708S09	378002.82	2316125.42	7.71
NBCT708S10	378007.09	2316124.74	7.87
NBCT708S11	378008.39	2316129.10	8.08
NBCT708S12	378004.56	2316129.76	7.98



4.0 CONTAMINATION ASSESSMENT FINDINGS

4.1 POTABLE WATER WELL/SENSITIVE RECEPTOR SURVEY. There are no potable water wells on the NAVBASE. The former UST 708 site is located more than 1/4 mile inside the NAVBASE boundary, therefore no potable water wells are within a 1/4 mile radius of the UST 708 site. The nearest sensitive receptor is a storm drain catch basin located 160 feet south of the site in front of 1422 Hobson Avenue which empties to the Cooper River through outfall number 20 as shown in Charleston Naval Shipyard Public Works Drawing H409-72. Surface runoff from the former UST 708 Site will drain to the Cooper River through this catch basin.

4.2 SOIL CONTAMINATION

4.2.1 Soil Vapor Monitoring Results As discussed in Subsection 3.1.1, a total of eight soil borings were advanced toward the water table at the former UST 708 site to help define the horizontal and vertical extent of contamination at the site. The borings were designated NBCT708S01 through NBCT708S08. As the borings were advanced, the soils were screened for hydrocarbon vapors at two foot intervals using an OVA.

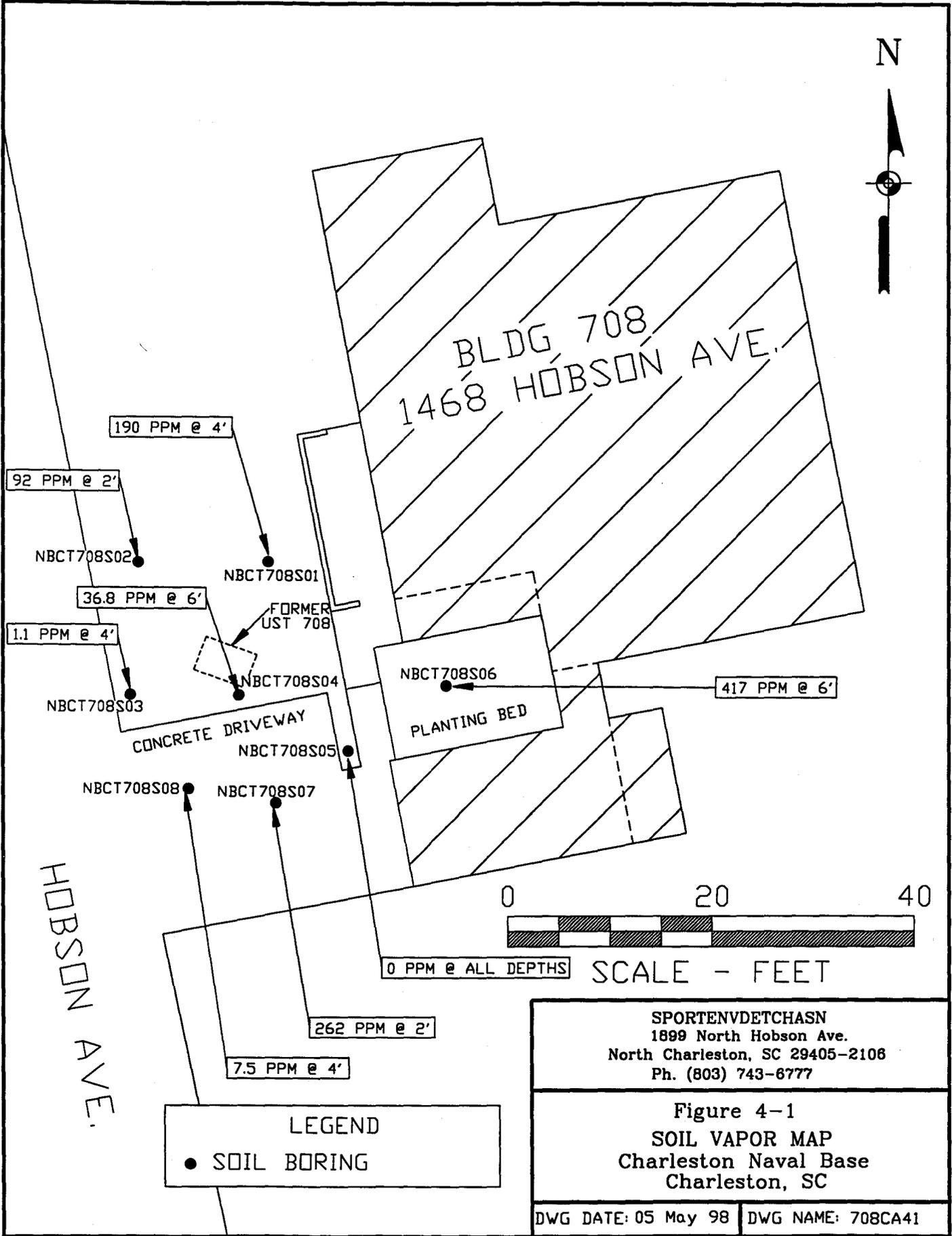
The results of the soil vapor monitoring at the UST 708 site were inconclusive. The soil vapor monitoring suggested the presence of hydrocarbon contamination but no soil vapor plume could be defined from the data. The highest OVA reading was 417 parts per million (PPM) at a depth of 6 feet bgs downgradient of the former tank location. The next highest reading, also downgradient at NBCT708S07, was 262 PPM at a depth of only 2 feet bgs immediately under the driveway. However, NBCT708S05 between these two samples was the only soil boring with a "zero" OVA analysis. The third and fourth highest OVA readings were upgradient of the former tank location at NBCT708S01 (190 PPM at 4 feet bgs) and NBCT708S02 (92 PPM at 2 feet bgs). The soil vapor monitoring results for the source area at boring NBCT708S04 were 36.8 PPM at 6' bgs. Figure 4-1 is a soil vapor map of the site showing the boring locations the maximum OVA readings detected in the soils from these borings and the sample depths from which the maximum OVA readings were detected.

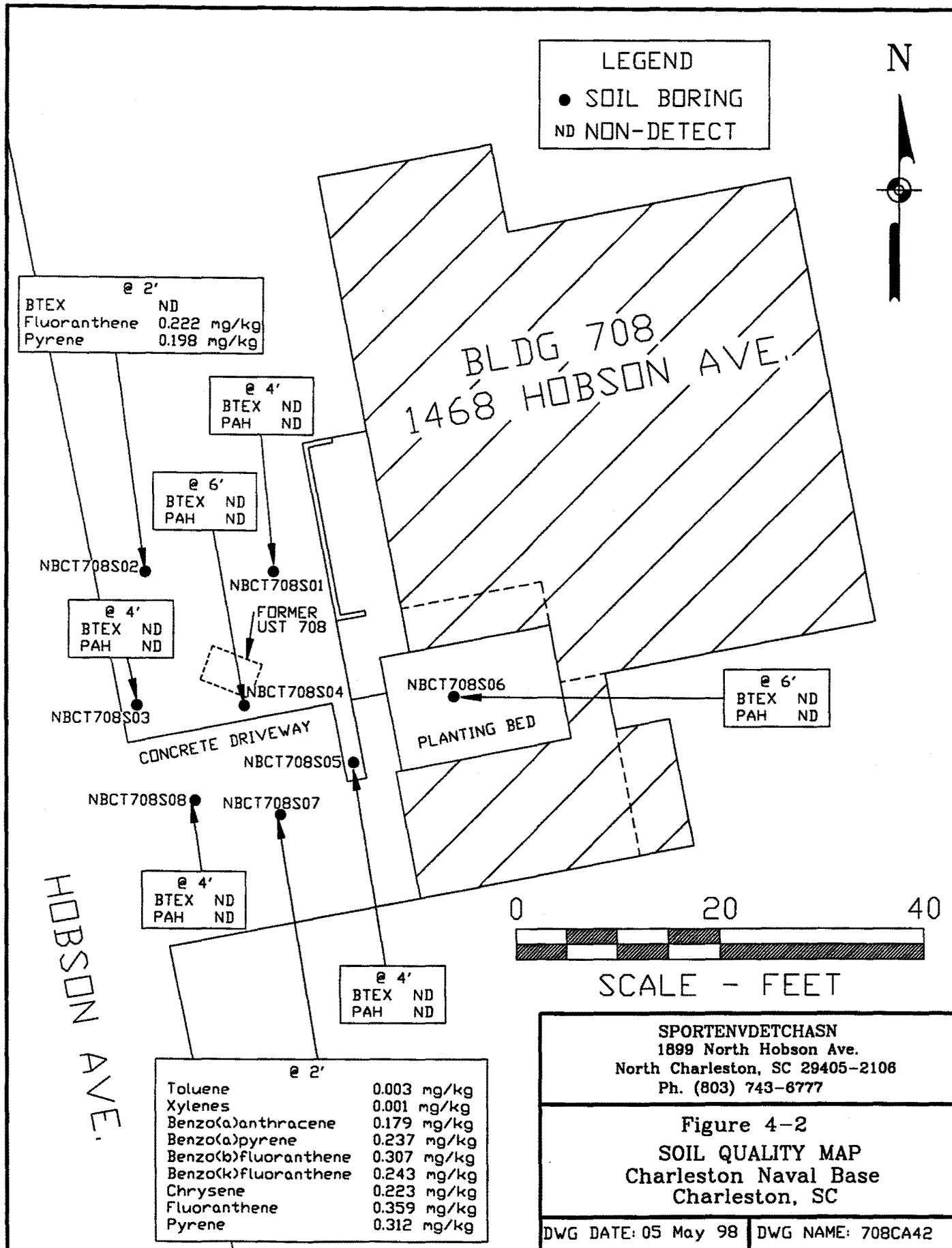
4.2.2 Soil Sampling Results

4.2.2.1 Soil Boring Sampling Results Laboratory analysis was performed on a sample from a single depth interval in each of the soil borings NBCT708S01 through NBCT708S08. Except for NBCT708S05, the analysis was performed on samples from the depth interval with the highest OVA reading. The analyses were performed to confirm the soil vapor monitoring results and determine the horizontal and vertical extent of soil contamination at the former UST 708 site. In each case, samples were analyzed for PAHs and BTEX + Naphthalene.

Though soil vapor monitoring results suggested the presence of petroleum hydrocarbon vapors at depths of 4 feet bgs or greater at soil borings NBCT708S01, NBCT708S04 and NBCT708S06, analytical results indicated that COCs were not present or were less than analytical DLs. The only petroleum hydrocarbon COCs detected in soil borings at the former UST 708 site were found in samples taken from the 2 foot depth interval in soil borings NBCT708S02 and NBCT708S07. Concentrations of PAHs were detected in sample NBCT708S020101 and Xylene, Toluene and PAHs were detected in sample NBCT708S070101. All concentrations detected were less than SCDHEC groundwater protection RBSLs or SCAP groundwater protection SSLs. Benzo(a)pyrene was detected in sample NBCT708S070101 at a concentration exceeding the residential soil ingestion RBC at the 2 foot depth interval under a concrete driveway. Figure 4-2 illustrates the analytical results for soil boring samples and the surface soil samples of section 4.2.2.2 below. Table 4-1 summarizes the analytical results of the soil boring program. Copies of the analytical reports are contained in Appendix C.

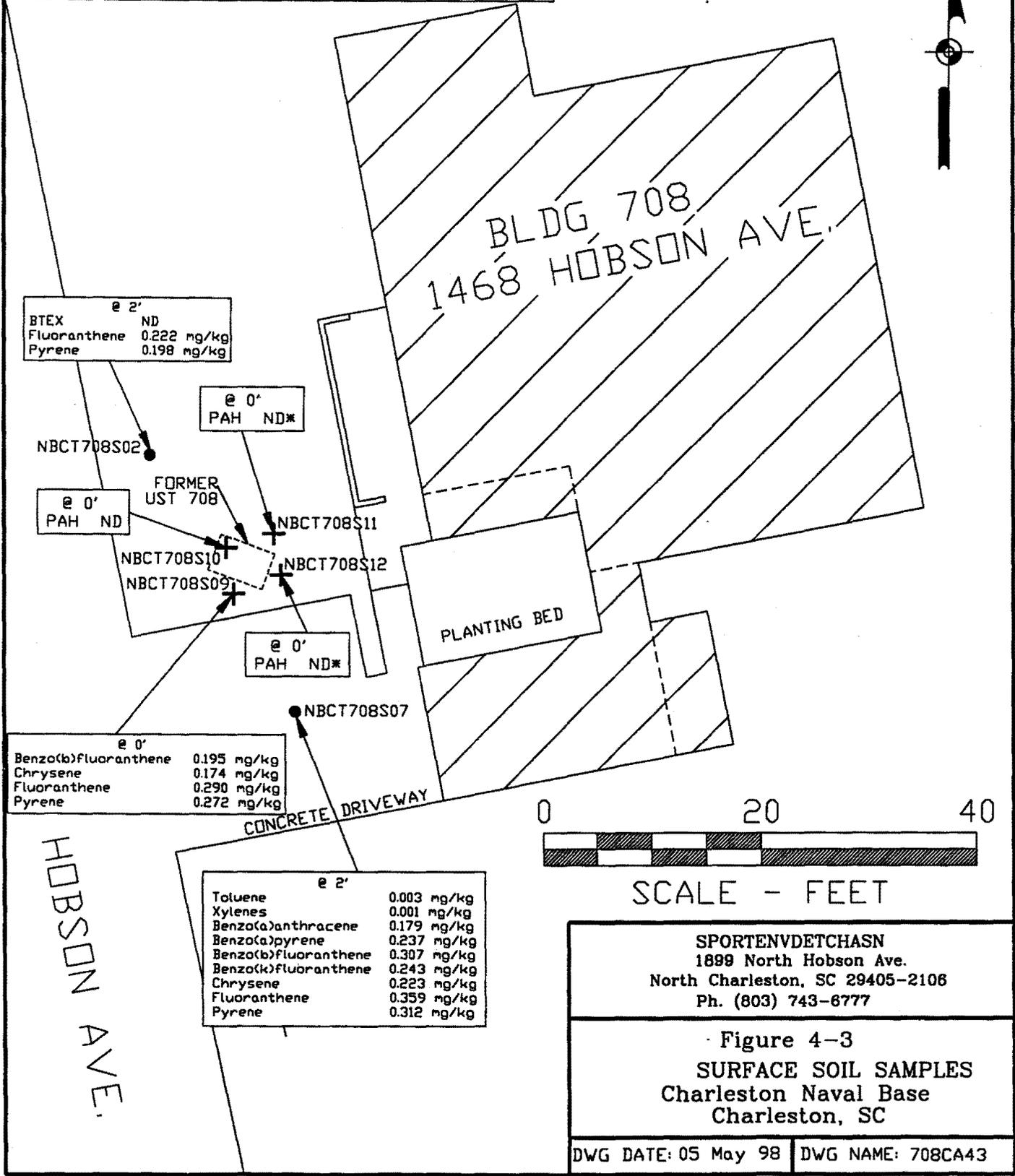
4.2.2.2 Surface Soil Sampling Results Laboratory analysis was performed on four surface soil samples taken the soil surrounding the UST excavation. The results of the analysis are presented in Table 4-2. Sample NBCT708S090101 contained concentrations of Benzo(b)fluoranthene, Chrysene, Fluoranthene and Phenanthrene below SCDHEC Residential Ingestion/Dermal Contact RBSLs or USEPA residential soil ingestion RBCs. Both sample NBCT708S090101 and soil boring sample NBCT708S020101 where COCs were detected in the two foot depth interval are located between the excavation and Hobson Avenue. COC concentrations in sample NBCT708S020101 are less than soil ingestion RBSLs or RBCs. Also, surface soil samples NBCT708S110101 and NBCT708S120101 contained matrix interferences which raised DLs for PAHs to 0.333 milligrams per kilogram (mg/kg), which exceeds the SCDHEC Residential Ingestion/Dermal Contact RBSL for Dibenzo(ah)anthracene and the residential soil ingestion RBC for Benzo(a)pyrene (both 0.088mg/kg). Figure 4-3 illustrates the analytical results for surface soil samples. Copies of the analytical reports are contained in Appendix C.





LEGEND

- SOIL BORING
- + SURFACE SOIL SAMPLE
- ND NON-DETECT
- ND* NON-DETECT, BUT DLs ELEVATED ABOVE SOME RBSLs - SEE SECTION 4.2.2.2



@ 2'

BTEX	ND
Fluoranthene	0.222 mg/kg
Pyrene	0.198 mg/kg

@ 0'

PAH	ND*
-----	-----

@ 0'

PAH	ND
-----	----

@ 0'

PAH	ND*
-----	-----

@ 0'

Benzo(k)fluoranthene	0.195 mg/kg
Chrysene	0.174 mg/kg
Fluoranthene	0.290 mg/kg
Pyrene	0.272 mg/kg

@ 2'

Toluene	0.003 mg/kg
Xylenes	0.001 mg/kg
Benzo(a)anthracene	0.179 mg/kg
Benzo(a)pyrene	0.237 mg/kg
Benzo(k)fluoranthene	0.307 mg/kg
Benzo(k)fluoranthene	0.243 mg/kg
Chrysene	0.223 mg/kg
Fluoranthene	0.359 mg/kg
Pyrene	0.312 mg/kg

SPORTENVDETCHASN
1899 North Hobson Ave.
North Charleston, SC 29405-2108
Ph. (803) 743-6777

Figure 4-3
SURFACE SOIL SAMPLES
Charleston Naval Base
Charleston, SC

DWG DATE: 05 May 98 | DWG NAME: 708CA43

Table 4-1 Analytical Results for Soil Samples
 Former UST 708 Site
 1468 North Hobson Avenue, North Charleston SC

SAMPLE NUMBER	NBCT708S010102	NBCT708S020101	NBCT708S030102	NBCT708S040103	NBCT708S050102
Associated Trip Blank	SPORT0631-1	SPORT0631-1	SPORT0631-1	SPORT0631-1	SPORT0631-1

ANALYTE:	RBSLs					
Benzene	0.007 mg/kg	ND	ND	ND	ND	ND
Ethylbenzene	1.50 mg/kg	ND	ND	ND	ND	ND
Toluene	1.70 mg/kg	ND	ND	ND	ND	ND
Xylenes (total)	44.0 mg/kg	ND	ND	ND	ND	ND
Naphthalene	0.200 mg/kg	ND	ND	ND	ND	ND
Acenaphthene	20.0 mg/kg	ND	ND	ND	ND	ND
Acenaphthylene	20.0 mg/kg	ND	ND	ND	ND	ND
Anthracene	430. mg/kg	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.700 mg/kg	ND	ND	ND	ND	ND
Benzo(a)pyrene	4.00 mg/kg	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.660 mg/kg	ND	ND	ND	ND	ND
Benzo(ghi)perylene	98.0 mg/kg	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	4.60 mg/kg	ND	ND	ND	ND	ND
Chrysene	0.660 mg/kg	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	2.60 mg/kg	ND	ND	ND	ND	ND
Fluoranthene	98.0 mg/kg	ND	0.222 mg/kg	ND	ND	ND
Fluorene	16.0 mg/kg	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	35.0 mg/kg	ND	ND	ND	ND	ND
Naphthalene	0.200 mg/kg	ND	ND	ND	ND	ND
Phenanthrene	98.0 mg/kg	ND	ND	ND	ND	ND
Pyrene	140. mg/kg	ND	0.198 mg/kg	ND	ND	ND

ND - Non-Detect

Table 4-1 Analytical Results for Soil Samples
 Former UST 708 Site
 1468 North Hobson Avenue, North Charleston SC

SAMPLE NUMBER	NBCT708S060103	NBCT708S070101	NBCT708S080102
Associated Trip Blank	SPORT0631-1	SPORT0631-1	SPORT0631-1

ANALYTE:	RBSLs			
Benzene	0.007 mg/kg	ND	ND	ND
Ethylbenzene	1.50 mg/kg	ND	ND	ND
Toluene	1.70 mg/kg	ND	0.003 mg/kg	ND
Xylenes (total)	44.0 mg/kg	ND	0.001 mg/kg	ND
Naphthalene	0.200 mg/kg	ND	ND	ND
Acenaphthene	20.0 mg/kg	ND	ND	ND
Acenaphthylene	20.0 mg/kg	ND	ND	ND
Anthracene	430. mg/kg	ND	ND	ND
Benzo(a)anthracene	0.700 mg/kg	ND	0.179 mg/kg	ND
Benzo(a)pyrene	4.00 mg/kg	ND	0.237 mg/kg	ND
Benzo(b)fluoranthene	0.660 mg/kg	ND	0.307 mg/kg	ND
Benzo(ghi)perylene	98.0 mg/kg	ND	ND	ND
Benzo(k)fluoranthene	4.60 mg/kg	ND	0.243 mg/kg	ND
Chrysene	0.660 mg/kg	ND	0.223 mg/kg	ND
Dibenzo(a,h)anthracene	2.60 mg/kg	ND	ND	ND
Fluoranthene	98.0 mg/kg	ND	0.359 mg/kg	ND
Fluorene	16.0 mg/kg	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	35.0 mg/kg	ND	ND	ND
Naphthalene	0.200 mg/kg	ND	ND	ND
Phenanthrene	98.0 mg/kg	ND	ND	ND
Pyrene	140. mg/kg	ND	0.312 mg/kg	ND

ND - Non-Detect

Table 4-2 Analytical Results for Surface Soil Samples
 Former UST 708 Site
 1468 North Hobson Avenue, North Charleston SC

SAMPLE NUMBER	NBCT708S090101	NBCT708S100101	NBCT708S110101	NBCT708S120101
Associated Trip Blank	SPORT0631-1	SPORT0631-1	SPORT0631-1	SPORT0631-1

ANALYTE:	RBSLs				
Acenaphthene	4700 mg/kg	ND	ND	ND	ND
Acenaphthylene	4700 mg/kg	ND	ND	ND	ND
Anthracene	23000 mg/kg	ND	ND	ND	ND
Benzo(a)anthracene	0.880 mg/kg	ND	ND	ND	ND
Benzo(a)pyrene	0.088 mg/kg	ND	ND	ND	ND
Benzo(b)fluoranthene	0.880 mg/kg	0.195 mg/kg	ND	ND	ND
Benzo(ghi)perylene	3100 mg/kg	ND	ND	ND	ND
Benzo(k)fluoranthene	8.80 mg/kg	ND	ND	ND	ND
Chrysene	88.0 mg/kg	0.174 mg/kg	ND	ND	ND
Dibenzo(a,h)anthracene	0.088 mg/kg	ND	ND	ND	ND
Fluoranthene	3100 mg/kg	0.290 mg/kg	ND	ND	ND
Fluorene	3100 mg/kg	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	0.880 mg/kg	ND	ND	ND	ND
Naphthalene	3100 mg/kg	ND	ND	ND	ND
Phenanthrene	3100 mg/kg	ND	ND	ND	ND
Pyrene	2300 mg/kg	0.272 mg/kg	ND	ND	ND

ND - Non-Detect

Shaded Areas - DL exceeds soil ingestion/dermal contact RBSL or RBC

5.0 CONTAMINATION ASSESSMENT CONCLUSIONS

The contamination assessment of the former UST 708 detected low levels of contamination which do not threaten groundwater at the site or the health of site residents. The following paragraphs summarize the conclusions of this contamination assessment investigation.

- No COCs were detected above groundwater protection RBSLs. Analysis of soil samples taken from borings made at the approximate location where COCs were found during UST removal failed to detect any COC. Based on these results, the former UST 708 site is not a threat to groundwater quality.
- Groundwater was not characterized at the former UST 708 site because no COC was detected at the site in excess of groundwater protection RBSLs at any depth between the land surface and the water table, making the likelihood of groundwater contamination negligible.
- The greatest number of COCs and the highest COC concentrations were detected immediately underneath the driveway in sample NBCT708S070101. None of the detections under the driveway exceeded groundwater protection RBSLs or SSLs. Concentrations of Benzo(a)pyrene exceeded the USEPA Region III residential soil ingestion RBC, but this presents no threat to site residents because this area is capped by a concrete driveway.
- The presence of COCs in soil boring sample NBCTS708S020101 and surface soil sample NBCT708S090101 suggest that an area of minimally contaminated surface soil exists between the former tank site and Hobson Avenue. All detected concentrations are less SCDHEC soil ingestion/dermal contact RBSLs or residential soil ingestion RBCs, so this area presents no treat to site residents.
- Surface soil samples NBCT708S110101 and NBCT708S120101 had DLs elevated above residential ingestion/dermal contact RBSLs for Dibenzo(ah)anthracene and the residential soil ingestion RBC for Benzo(a)pyrene. However, detection of Dibenzo(ah)anthracene at the NAVBASE has been extremely rare. Benzo(a)pyrene, while fairly common at the NAVBASE, is usually accompanied by other COCs, particularly Pyrene and Phenanthrene, at higher concentrations. With no PAH detected in any surface soil sample, the possibility that Dibenzo(ah)anthracene or Benzo(a)pyrene is present in surface soils at the former UST 708 site is negligible. Surface soils at the former UST 708 site are not a threat to site residents.

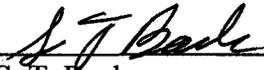
6.0 RECOMMENDATIONS

Based on the findings of the Contamination Assessment of the former UST 708 site, the Navy recommends no further action for this site.

7.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound engineering principles and judgment. This assessment is based on the field investigation and associated information detailed in text and appended to this report. If conditions are determined to exist that differ from those described the undersigned engineers should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment was developed for the former UST site located at Quarters Building 708, 1468 Hobson Avenue, North Charleston SC and applies only to that site:

PREPARER:



S. T. Beale
Project Engineer

REVIEWER:



C. F. Militzer PE
P. E. South Carolina No. 17638

5-26-98

Date

REFERENCES

Ensafe/Allen & Hoshall, Final Comprehensive Sampling and Analysis Plan (CSAP) RCRA Facility Investigation dated August 30, 1994

Ensafe/Allen & Hoshall, Final RFI Report CTO-0029, Zone B dated November 21, 1996

Ensafe/Allen & Hoshall, Draft Zone I RCRA Facility Investigation Report NAVBASE Charleston dated January 1996

Ensafe/Allen & Hoshall, Final RCRA Facility Investigation Report for Zone H Naval Base Charleston dated July 5, 1996

SCDHEC Underground Storage Tank Assessment Guidelines for Permanent Closure, Change-in Owner and Change-in-Service dated June 1995

SCDHEC Risk-Based Corrective Action for Petroleum Releases dated June 20, 1997

SCDHEC letter dated September 2, 1997, (Paul Bristol to J. T. Amey) "Re: Soil Corrective Action Plan/Response to Comments dated July 30, 1997"

South Carolina R. 61-71 South Carolina Well Regulations and Standards

South Carolina R61-58.5 Maximum Contaminant Levels in Drinking Water

Base Realignment and Closure Tank Management Plan Charleston Naval Complex, Charleston SC

Soil Corrective Action Plan for Excavated Soil from Underground Storage Tanks (Bioremediation Study) Naval Base Charleston, Charleston SC dated January 28, 1997.

Underground Storage Tank Assessment (UST) Assessment Report for Charleston Naval Base Complex, NS 708, Dated 30 September 1996

United States Environmental Protection Agency (USEPA) Environmental Services Division *Standard Operating Procedures and Quality Assurance Manual (SOPQAM)*

United States Environmental Protection Agency (USEPA) Region III RBC Table dated September 23, 1996

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S01	
SAMPLING METHOD: GRAB		SHEET 1 OF 1	
		BORING	
		START	FINISH
WATER LEVEL	6' BGS	TIME	TIME
TIME	948	900	948
DATE	24-Mar-98	DATE	DATE
CASING DEPTH		24-Mar-98	24-Mar-98

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING: 378015.63 EASTING: 2316130.33
ELEVATION: 8.69 ft. msl

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: GRASS LAWN
							0		
							1		
						0.00	2		SAND - LIGHT TAN IN COLOR - NO PETRO ODOR
							3		
HA			1			190.00	4	X	SAND - BLACK IN COLOR - SEWER ODOR? SAMPLE NBCT708S010102
				2			5		
						22.40	6		SAND - GRAY IN COLOR - UNSPECIFIED ORGANIC ODOR
							7		
							8		
							9		
							0		
							1		
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							0		

BY _____ DATE: _____
CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S02 SHEET 1 OF 1	
SAMPLING METHOD: GRAB		BORING	
WATER LEVEL		4' BGS	
TIME	1023	START TIME 1000	FINISH TIME 1023
NORTHING: 378015.59	EASTING: 2316117.63	DATE: 24-Mar-98	DATE: 24-Mar-98
ELEVATION: 7.48 ft. msl	CASING DEPTH	24-Mar-98	24-Mar-98

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING: 378015.59 EASTING: 2316117.63
ELEVATION: 7.48 ft. msl

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: GRASS LAWN	
									START DATE	FINISH DATE
							0			
							1			
HA			1	1		92.30	2			SAND - BROWN TO GRAY IN COLOR - NO ODOR SAMPLE NBCT708S020101
							3			
							4			SAND - DARK BROWN TO BLACK IN COLOR - NO ODOR WET
							5			
							6			
							7			
							8			
							9			
							0			
							1			
							2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							0			

BY _____ DATE: _____
CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S04	
SAMPLING METHOD: GRAB		SHEET 1 OF 1	
		BORING	
		START	FINISH
WATER LEVEL	6' BGS	TIME	TIME
TIME	1317	1245	1317
NORTHING:	378002.53	EASTING:	2316127.45
ELEVATION:	7.96 ft. msl	DATE	24-Mar-98
		DATE	24-Mar-98

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: GRASS LAWN	
							0			
							1			
						0.00	2		SAND - MULTI-COLORED TAN TO BLACK IN COLOR	
							3			
						20.50	4		SAND - DARK BROWN-BLACK IN COLOR - NO ODOR	
							5			
HA			1	3		36.80	6		SAND - BLACK IN COLOR - NO ODOR - WET	
							7		SAMPLE NBCT708S040103	
							8			
							9			
							0			
							1			
							2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							0			

BY _____ DATE: _____
 CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S05	
SAMPLING METHOD:		BORING	
GRAB		START	FINISH
WATER LEVEL	UNKNOWN	TIME	TIME
TIME		1335	1346
NORTHING: 377997.00	EASTING: 2316138.22	DATE	DATE
ELEVATION: 8.99 ft. msl		24-Mar-98	24-Mar-98

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH
							0	SURFACE CONDITIONS: BARE SANDY SOIL BESIDE CONCRETE DRIVEWAY
							1	
						0.00	2	
							3	
HA			1	2		0.00	4	
							5	
							6	
							7	
							8	
							9	
							0	
							1	
							2	
							3	
							4	
							5	
							6	
							7	
							8	
							9	
							0	

SAND - MEDIUM TAN IN COLOR - NO ODOR

SAND - MULTI-COLORED TAN TO BLACK - NO ODOR
SAMPLE NBCT708S050102

OBSTRUCTION (CREOSOTE TIMBER) ENCOUNTERED
BORING TERMINATED

BY _____ DATE: _____
CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S06	
SAMPLING METHOD: GRAB		SHEET 1 OF 1	
		BORING	
WATER LEVEL	6.5' BGS	START	FINISH
TIME	1430	TIME	TIME
		1400	1430
DATE	24-Mar-98	DATE	DATE
		24-Mar-98	24-Mar-98
CASING DEPTH			

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING:	378003.44	EASTING:	2316147.99
ELEVATION:	9.38 ft. msl		

SAMPLER TYPE	IN. DRIVEN IN RECOVERED	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: BARE SANDY SOIL
						0		
						1		
					0.00	2		SAND - MEDIUM TAN IN COLOR - NO ODOR
						3		
					0.00	4		SAND - MEDIUM TAN IN COLOR - NO ODOR
						5		
HA			1	3	417.00	6		
						7		SAND - MEDIUM TO LIGHT TAN IN COLOR - NO ODOR SAMPLE NBCT708S060103
						8		
						9		
						0		
						1		
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

BY _____ DATE: _____
CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S07	
SAMPLING METHOD: GRAB		SHEET 1 OF 1	
WATER LEVEL		5.5' BGS	
TIME	945	START	FINISH
DATE	25-Mar-98	DATE	DATE
CASING DEPTH		25-Mar-98	25-Mar-98

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING: 377991.91 EASTING: 2316131.05
ELEVATION: 7.92 ft. msl

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: CONCRETE DRIVEWAY
							0		
							1		
HA			1	1		262.00	2		SAND - TAN TO BLACK IN COLOR - NO ODOR SAMPLE NBCT708S070101
							3		
						240.00	4		SAND - MEDIUM TAN IN COLOR - NO ODOR
							5		
						50.00	6		SAND - MEDIUM TAN IN COLOR - NO ODOR
							7		
							8		
							9		
							0		
							1		
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							0		

BY _____ DATE: _____
CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S08	
SAMPLING METHOD: GRAB		SHEET 1 OF 1	
		BORING	
		START	FINISH
WATER LEVEL	4' BGS	TIME	TIME
TIME	1009	958	1009
DATE	25-Mar-98	DATE	DATE
CASING DEPTH		25-Mar-98	25-Mar-98

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING: 377993.28 EASTING: 2316122.55
ELEVATION: 7.06 ft. msl

SAMPLER TYPE	IN DRIVEN IN RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	
							0		SURFACE CONDITIONS: CONCRETE DRIVEWAY
							1		
						2.20	2		
							3		
HA			1			7.50	4		
			2				5		
							6		
							7		
							8		
							9		
							0		
							1		
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							0		

SURFACE CONDITIONS: CONCRETE DRIVEWAY

SAND - TAN TO BLACK IN COLOR - NO ODOR

SAND - MEDIUM TAN IN COLOR - NO ODOR
SAMPLE NBCT7080102

BY _____ DATE: _____
CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S09	
SAMPLING METHOD: GRAB (SURFACE SOIL)		SHEET 1 OF 1	
		BORING	
WATER LEVEL	N/A	START TIME 1015	FINISH TIME 1015
DATE		DATE	DATE
CASING DEPTH		25-Mar-98	25-Mar-98

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING:	378002.82	EASTING:	2316129.72
ELEVATION:	7.71 ft msl		

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: GRASS LAWN
HA			1	1			0		SAND - GRAY TO BLACK IN COLOR - NO ODOR
							1		SAMPLE NBCT708S090101
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							0		
							1		
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							0		

BY _____
DATE: _____
CHK BY: _____

ENVIRONMENTAL DETACHMENT CHARLESTON SOIL BORING LOG				JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
LOCATION OF BORING: QUARTERS BUILDING 708 1468 HOBSON AVENUE NORTH CHARLESTON SC 29405				DRILLING METHOD: HAND AUGER		BORING NO 708S10	
				SAMPLING METHOD: GRAB (SURFACE SOIL)		BORING	
NORTHING: 378007.09				EASTING: 23161124.74		START	FINISH
ELEVATION: 7.87 ft. msl				DATE		TIME	TIME
CASING DEPTH				DATE		25-Mar-98	25-Mar-98
SAMPLER TYPE	IN. DRIVEN IN RECOVERED	DEPTH OF CASING	SAMPLE NO. SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH
HA			1			0	SURFACE CONDITIONS: GRASS LAWN SAND - BLACK IN COLOR - NO ODOR SAMPLE NBCT708S100101
			1			1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						0	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						0	

BY _____ DATE: _____
 CHK BY: _____

ENVIRONMENTAL DETACHMENT CHARLESTON SOIL BORING LOG				JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV				
LOCATION OF BORING: QUARTERS BUILDING 708 1468 HOBSON AVENUE NORTH CHARLESTON SC 29405				DRILLING METHOD: HAND AUGER		BORING NO 708S11				
				SAMPLING METHOD: GRAB (SURFACE SOIL)		SHEET 1 OF 1				
NORTHING: 3780008.39				EASTING: 2316129.10		BORING				
ELEVATION: 8.08 ft. msl				WATER LEVEL: N/A		START	FINISH			
NORTHING: 3780008.39				EASTING: 2316129.10		TIME	TIME			
ELEVATION: 8.08 ft. msl				DATE		1028	1028			
ELEVATION: 8.08 ft. msl				CASING DEPTH		DATE	DATE			
ELEVATION: 8.08 ft. msl				CASING DEPTH		25-Mar-98	25-Mar-98			
SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS: GRASS LAWN BESIDE CONCRETE DRIVEWAY	
									HA	
							0		SAND - GRAY TO BLACK IN COLOR - NO ODOR	
							1		SAMPLE NBCT708S110101	
							2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							0			
							1			
							2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							0			

BY _____ DATE: _____
 CHK BY: _____

**ENVIRONMENTAL DETACHMENT
CHARLESTON
SOIL BORING LOG**

JOB ORDER: T-SAP 708		CLIENT: SOUTH DIV	
DRILLING METHOD: HAND AUGER		BORING NO 708S12	
SAMPLING METHOD: GRAB (SURFACE SAMPLE)		SHEET 1 OF 1	
		BORING	
		START	FINISH
WATER LEVEL	N/A	TIME	TIME
TIME		1036	1036
DATE		DATE	DATE
CASING DEPTH		25-Mar-98	25-Mar-98

LOCATION OF BORING: QUARTERS BUILDING 708
1468 HOBSON AVENUE
NORTH CHARLESTON SC 29405

NORTHING: 378004.56 EASTING: 2316129.76
ELEVATION: 7.98 ft msl

SAMPLER TYPE	IN. DRIVEN IN. RECOVERED	DEPTH OF CASING	SAMPLE NO. SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH
HA			1 1			0	SURFACE CONDITIONS: GRASS LAWN SAND - GRAY TO BLACK IN COLOR - NO ODOR SAMPLE NBCT708S120101
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						0	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						0	

BY _____
DATE: _____
CHK BY: _____

CHAIN OF CUSTODY RECORD

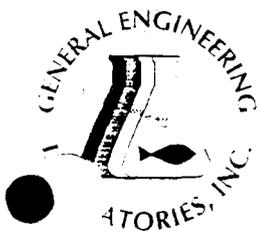
Page 1 of 1

Client Name/Facility Name				# OF CONTAINERS	SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods														Remarks				
Collected by/Company					pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide			Coliform - specify type	BTEX/NAP	P A H
SAMPLE ID	DATE	TIME			WELL	SOIL	COMP	GRAB															
SPORT0631-1	3/24/98	0800		X		X													X		708-1 soil Trip Blank		
SPORT0631-2	3/24/98	0915		X		X													X	X	NBCT 7085010102 NBCT 7085020101		
SPORT0631-3	3/24/98	1000		X		X													X	X	NBCT 7085020101 <i>2ma</i>		
SPORT0631-4	3/24/98	1045		X		X													X	X	NBCT 7085030102		
SPORT0631-5	3/24/98	1317		X		X													X	X	NBCT 7085040103		
SPORT0631-6	3/24/98	1346		X		X													X	X	NBCT 7085050102		
SPORT0631-7	3/24/98	1430		X		X													X	X	NBCT 7085060103		
SPORT0631-8	3/25/98	0920		X		X													X	X	NBCT 7085070101		
SPORT0631-9	3/25/98	1009		X		X													X	X	NBCT 7085080102		
SPORT0631-10	3/25/98	1015		X		X														X	NBCT 7085090101		
SPORT0631-11	3/25/98	1021		X		X														X	NBCT 7085100101		
SPORT0631-12	3/25/98	1028		X		X														X	NBCT 7085110101		
SPORT0631-13	3/25/98	1036		X		X														X	NBCT 7085120101		
Relinquished by:		Date:	Time:	Received by:		Relinquished by:		Date:	Time:	Received by:		Date:		Time:	Received by:								
<i>William R. Hines, Jr.</i>		3/25/98	1303	<i>W.R. Hines, Jr.</i>		<i>W.R. Hines, Jr.</i>		3/26/98	1331	<i>Debra Lee Forester</i>													
Relinquished by:		Date:	Time:	Received by lab by:		Date:	Time:	Remarks:															

White = sample collector Yellow = file Pink = with report

Table C-1
Sample Cross-Reference List
Quarters Building 708
1468 Hobson Avenue
North Charleston South Carolina

DET Laboratory No.	Contamination Assessment Identification
SPORT0631-1	Soil Trip Blank
SPORT0631-2	NBCT708S010102
SPORT0631-3	NBCT708S020101
SPORT0631-4	NBCT708S030102
SPORT0631-5	NBCT708S040103
SPORT0631-6	NBCT708S050102
SPORT0631-7	NBCT708S060103
SPORT0631-8	NBCT708S070101
SPORT0631-9	NBCT708S080102
SPORT0631-10	NBCT708S090101
SPORT0631-11	NBCT708S100101
SPORT0631-12	NBCT708S110101
SPORT0631-13	NBCT708S120101



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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 02, 1998

Page 1 of 2

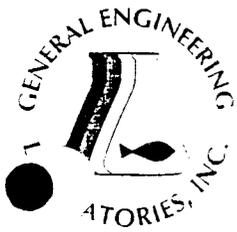
Sample ID : SPORT0631-1
 Lab ID : 9803643-01
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>4 items</i>											
Acetone	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0519	119097	1
o-xylene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX-8260	85.6	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	86.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	83.8	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	85.6	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	86.6	(63.4 - 136.)
Toluene-d8	NAP-8260	83.8	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260





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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 02, 1998

Page 2 of 2

Sample ID : SPORT0631-1

M = Method

Method-Description

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.



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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 1 of 2

Sample ID : SPORT0631-2
 Lab ID : 9803643-02
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>4 items</i>											
ne	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0550	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	RLC	03/31/98	1145	119164	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

Following prep procedures were performed:

MS Base/Neutral Compounds

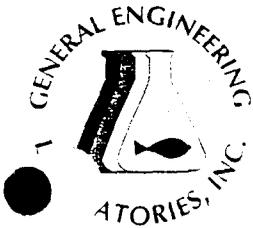
RDH 03/30/98 1445 119164 3

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9803643-02





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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 2 of 2

Sample ID : SPORT0631-2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	66.5	(30.0 - 115.)
Nitrobenzene-d5	M610	75.6	(23.0 - 120.)
p-Terphenyl-d14	M610	77.8	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	101.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	84.0	(63.4 - 136.)
Toluene-d8	BTEX-8260	91.8	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	101.	(53.5 - 154.)
Fluoromethane	NAP-8260	84.0	(63.4 - 136.)
ne-d8	NAP-8260	91.8	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

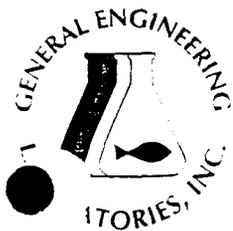
U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Reviewed By





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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 1 of 2

Sample ID : SPORT0631-3
 Lab ID : 9803643-03
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>ENV - 4 items</i>											
Acetylene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0621	119097	1
o-xylene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	RLC	03/31/98	1216	119164	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	J	222	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	J	198	167	333	ug/kg	1.0					

Following prep procedures were performed:
 .S Base/Neutral Compounds

RDH 03/30/98 1445 119164 3

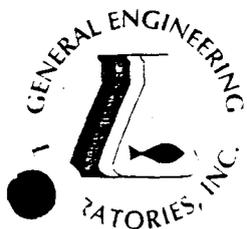
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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 2 of 2

Sample ID : SPORT0631-3

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	74.6	(30.0 - 115.)
Nitrobenzene-d5	M610	78.0	(23.0 - 120.)
p-Terphenyl-d14	M610	86.2	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	101.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	84.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	92.0	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	101.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	84.6	(63.4 - 136.)
Toluene-d8	NAP-8260	92.0	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

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U indicates that the analyte was not detected at a concentration greater than the detection limit.

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This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


Reviewed By



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 1 of 2

Sample ID : SPORT0631-4
 Lab ID : 9803643-04
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>TEX - 4 items</i>											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0652	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	RLC	03/31/98	1247	119164	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

Following prep procedures were performed:

MS Base/Neutral Compounds

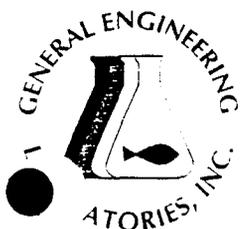
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Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 2 of 2

Sample ID : SPORT0631-4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	62.9	(30.0 - 115.)
Nitrobenzene-d5	M610	70.7	(23.0 - 120.)
p-Terphenyl-d14	M610	73.5	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	91.0	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	87.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	86.4	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	91.0	(53.5 - 154.)
Bromofluoromethane	NAP-8260	87.4	(63.4 - 136.)
ne-d8	NAP-8260	86.4	(72.1 - 137.)

M = Method Method-Description

M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

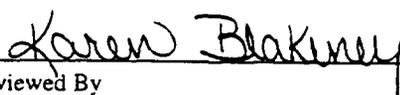
ND indicates that the analyte was not detected at a concentration greater than the detection limit.

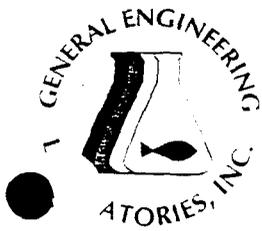
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


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TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

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Sample ID : SPORT0631-5
 Lab ID : 9803643-05
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>TEX - 4 items</i>											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0723	119097	1
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	RLC	03/31/98	1318	119164	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

Following prep procedures were performed:
 AS Base/Neutral Compounds

RDH 03/30/98 1445 119164 3

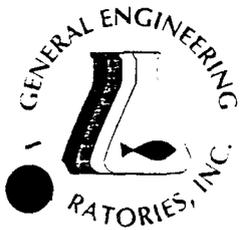
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TN	02934	02934

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North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Sample ID : SPORT0631-5

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610	67.8	(30.0 - 115.)
Nitrobenzene-d5	M610	78.0	(23.0 - 120.)
p-Terphenyl-d14	M610	77.6	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	100.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	77.8	(63.4 - 136.)
Toluene-d8	BTEX-8260	88.8	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	100.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	77.8	(63.4 - 136.)
Toluene-d8	NAP-8260	88.8	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

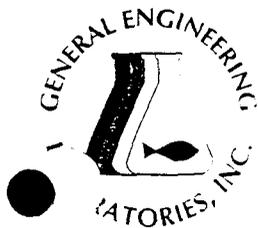
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


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 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

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Sample ID : SPORT0631-6
 Lab ID : 9803643-06
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

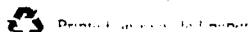
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>TEX - 4 items</i>											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0755	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	RLC	03/31/98	1350	119164	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

Flowing prep procedures were performed:
 .IS Base/Neutral Compounds

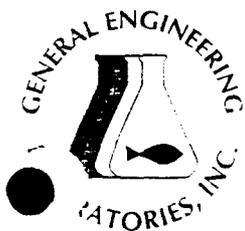
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Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Sample ID : SPORT0631-6

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	65.0	(30.0 - 115.)
Nitrobenzene-d5	M610	71.8	(23.0 - 120.)
p-Terphenyl-d14	M610	79.6	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	101.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	91.0	(63.4 - 136.)
Toluene-d8	BTEX-8260	90.6	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	101.	(53.5 - 154.)
Bromofluoromethane	NAP-8260	91.0	(63.4 - 136.)
Toluene-d8	NAP-8260	90.6	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

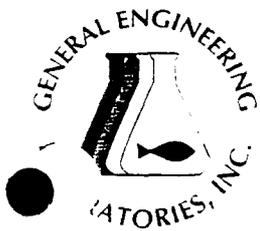
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


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Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Report Date: April 07, 1998

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Sample ID : SPORT0631-7
 Lab ID : 9803643-07
 Matrix : Soil
 Date Collected : 03/24/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

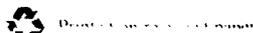
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Y - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0826	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	165	330	ug/kg	1.0	RLC	03/31/98	1421	119164	2
Acenaphthylene	U	0.00	165	330	ug/kg	1.0					
Anthracene	U	0.00	165	330	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	165	330	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	165	330	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	165	330	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	165	330	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	165	330	ug/kg	1.0					
Chrysene	U	0.00	165	330	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	165	330	ug/kg	1.0					
Fluoranthene	U	0.00	165	330	ug/kg	1.0					
Fluorene	U	0.00	165	330	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	165	330	ug/kg	1.0					
Naphthalene	U	0.00	165	330	ug/kg	1.0					
Phenanthrene	U	0.00	165	330	ug/kg	1.0					
Pyrene	U	0.00	165	330	ug/kg	1.0					

Following prep procedures were performed:
 MS Base/Neutral Compounds

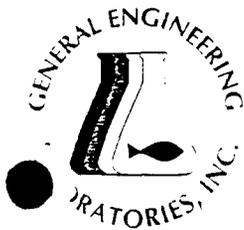
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TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
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North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 2 of 2

Sample ID : SPORT0631-7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	71.4	(30.0 - 115.)
Nitrobenzene-d5	M610	77.0	(23.0 - 120.)
p-Terphenyl-d14	M610	79.5	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	102.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	90.2	(63.4 - 136.)
Toluene-d8	BTEX-8260	90.2	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	102.	(53.5 - 154.)
Bromofluoromethane	NAP-8260	90.2	(63.4 - 136.)
Toluene-d8	NAP-8260	90.2	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

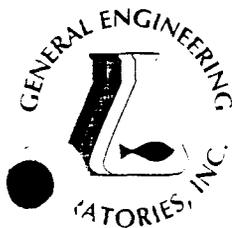
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Report Date: April 07, 1998

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Sample ID : SPORT0631-8
 Lab ID : 9803643-08
 Matrix : Soil
 Date Collected : 03/25/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
v - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/30/98	1841	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene		2.69	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	J	1.22	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.948	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	166	331	ug/kg	1.0	RLC	03/31/98	1453	119164	2
Acenaphthylene	U	0.00	166	331	ug/kg	1.0					
Anthracene	U	0.00	166	331	ug/kg	1.0					
Benzo(a)anthracene	J	179	166	331	ug/kg	1.0					
Benzo(a)pyrene	J	237	166	331	ug/kg	1.0					
Benzo(b)fluoranthene	J	307	166	331	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	331	ug/kg	1.0					
Benzo(k)fluoranthene	J	243	166	331	ug/kg	1.0					
Chrysene	J	223	166	331	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	331	ug/kg	1.0					
Fluoranthene		359	166	331	ug/kg	1.0					
Fluorene	U	0.00	166	331	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	331	ug/kg	1.0					
Naphthalene	U	0.00	166	331	ug/kg	1.0					
Phenanthrene	U	0.00	166	331	ug/kg	1.0					
Pyrene	J	312	166	331	ug/kg	1.0					

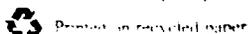
Following prep procedures were performed:
 AS Base/Neutral Compounds

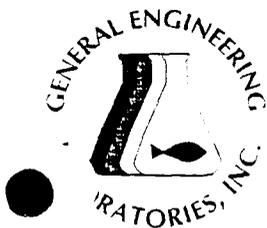
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TN	02934	02934

Client: Supervisor of Ship Building & Conversion
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North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

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Sample ID : SPORT0631-8

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610	74.3	(30.0 - 115.)
Nitrobenzene-d5	M610	78.8	(23.0 - 120.)
p-Terphenyl-d14	M610	82.5	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	107.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	89.0	(63.4 - 136.)
Toluene-d8	BTEX-8260	95.2	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	107.	(53.5 - 154.)
Bromofluoromethane	NAP-8260	89.0	(63.4 - 136.)
Toluene-d8	NAP-8260	95.2	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


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NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 1 of 2

Sample ID : SPORT0631-9
 Lab ID : 9803643-09
 Matrix : Soil
 Date Collected : 03/25/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>Y - 4 items</i>											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/27/98	1829	119013	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	0.00	165	330	ug/kg	1.0	RLC	03/31/98	1524	119164	2
Acenaphthylene	U	0.00	165	330	ug/kg	1.0					
Anthracene	U	0.00	165	330	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	165	330	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	165	330	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	165	330	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	165	330	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	165	330	ug/kg	1.0					
Chrysene	U	0.00	165	330	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	165	330	ug/kg	1.0					
Fluoranthene	U	0.00	165	330	ug/kg	1.0					
Fluorene	U	0.00	165	330	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	165	330	ug/kg	1.0					
Naphthalene	U	0.00	165	330	ug/kg	1.0					
Phenanthrene	U	0.00	165	330	ug/kg	1.0					
Pyrene	U	0.00	165	330	ug/kg	1.0					

Following prep procedures were performed:

AS Base/Neutral Compounds

RDH 03/30/98 1445 119164 3

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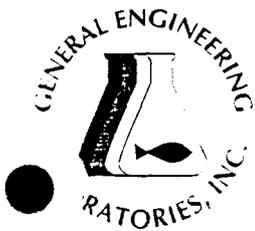
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1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Report Date: April 07, 1998

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Sample ID : SPORT0631-9

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	65.9	(30.0 - 115.)
Nitrobenzene-d5	M610	77.3	(23.0 - 120.)
p-Terphenyl-d14	M610	76.2	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	85.6	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	87.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	85.0	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	85.6	(53.5 - 154.)
romofluoromethane	NAP-8260	87.4	(63.4 - 136.)
ene-d8	NAP-8260	85.0	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

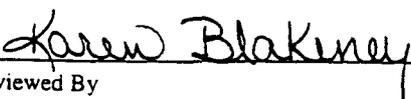
ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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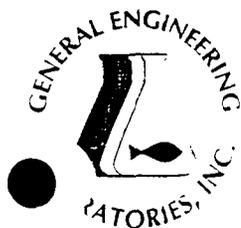

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Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Report Date: April 07, 1998

Page 1 of 2

Sample ID : SPORT0631-10
 Lab ID : 9803643-10
 Matrix : Soil
 Date Collected : 03/25/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>nuclear Aromatic Hydrocarbons - 16 items</i>											
aphthene	U	0.00	167	333	ug/kg	1.0	RLC	04/01/98	0752	119164	1
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	J	195	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	J	174	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	J	290	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	J	272	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/30/98 1445 119164 2

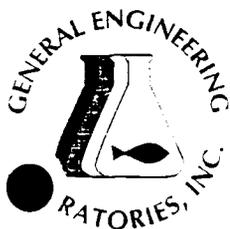
Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	69.3	(30.0 - 115.)
benzene-d5	M610	74.5	(23.0 - 120.)
phenyl-d14	M610	80.7	(37.3 - 128.)

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TN	02934	02934

Client: Supervisor of Ship Building & Conversion
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1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

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Sample ID : SPORT0631-10

Surrogate Recovery	Test	Percent%	Acceptable Limits
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M = Method	Method-Description
M 1	EPA 8270
M 2	EPA 3550

Qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

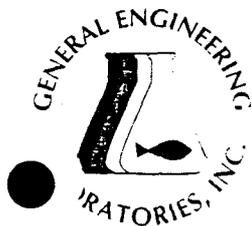
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Sample ID : SPORT0631-11
Lab ID : 9803643-11
Matrix : Soil
Date Collected : 03/25/98
Date Received : 03/26/98
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
naphthene	U	0.00	165	330	ug/kg	1.0	RLC	04/01/98	0823	119164	1
Acenaphthylene	U	0.00	165	330	ug/kg	1.0					
Anthracene	U	0.00	165	330	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	165	330	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	165	330	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	165	330	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	165	330	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	165	330	ug/kg	1.0					
Chrysene	U	0.00	165	330	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	165	330	ug/kg	1.0					
Fluoranthene	U	0.00	165	330	ug/kg	1.0					
Fluorene	U	0.00	165	330	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	165	330	ug/kg	1.0					
Naphthalene	U	0.00	165	330	ug/kg	1.0					
Phenanthrene	U	0.00	165	330	ug/kg	1.0					
Pyrene	U	0.00	165	330	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/30/98 1445 119164 2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	68.0	(30.0 - 115.)
1,2,4-Trichlorobenzene-d5	M610	72.7	(23.0 - 120.)
1,2,4-Trichlorobiphenyl-d14	M610	75.1	(37.3 - 128.)

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SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 07, 1998

Page 2 of 2

Sample ID : SPORT0631-11

Surrogate Recovery	Test	Percent%	Acceptable Limits
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M = Method	Method-Description
------------	--------------------

M 1	EPA 8270
M 2	EPA 3550

... qualifiers in this report are defined as follows:

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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Karen Blakeney
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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Report Date: April 07, 1998

Page 1 of 2

Sample ID : SPORT0631-12
 Lab ID : 9803643-12
 Matrix : Soil
 Date Collected : 03/25/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Naphthalene	U	0.00	333	666	ug/kg	2.0	RLC	04/06/98	1150	119164	1
Acenaphthylene	U	0.00	333	666	ug/kg	2.0					
Anthracene	U	0.00	333	666	ug/kg	2.0					
Benzo(a)anthracene	U	0.00	333	666	ug/kg	2.0					
Benzo(a)pyrene	U	0.00	333	666	ug/kg	2.0					
Benzo(b)fluoranthene	U	0.00	333	666	ug/kg	2.0					
Benzo(ghi)perylene	U	0.00	333	666	ug/kg	2.0					
Benzo(k)fluoranthene	U	0.00	333	666	ug/kg	2.0					
Chrysene	U	0.00	333	666	ug/kg	2.0					
Dibenzo(a,h)anthracene	U	0.00	333	666	ug/kg	2.0					
Fluoranthene	U	0.00	333	666	ug/kg	2.0					
Fluorene	U	0.00	333	666	ug/kg	2.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	333	666	ug/kg	2.0					
Naphthalene	U	0.00	333	666	ug/kg	2.0					
Phenanthrene	U	0.00	333	666	ug/kg	2.0					
Pyrene	U	0.00	333	666	ug/kg	2.0					

The following prep procedures were performed:
 GC/MS Base/Neutral Compounds

RDH 03/30/98 1445 119164 2

Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.





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Report Date: April 07, 1998

Page 2 of 2

Sample ID : SPORT0631-12

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	87.3	(30.0 - 115.)
Nitrobenzene-d5	M610	82.3	(23.0 - 120.)
p-Terphenyl-d14	M610	101.	(37.3 - 128.)

M = Method

Method-Description

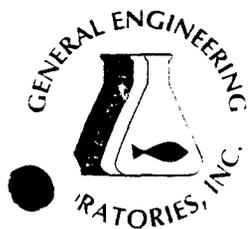
EPA 8270

EPA 3550

- Notes:
- The qualifiers in this report are defined as follows:
 - ND indicates that the analyte was not detected at a concentration greater than the detection limit.
 - J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
 - U indicates that the analyte was not detected at a concentration greater than the detection limit.
 - * indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

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Report Date: April 07, 1998

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Sample ID : SPORT0631-13
 Lab ID : 9803643-13
 Matrix : Soil
 Date Collected : 03/25/98
 Date Received : 03/26/98
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
naphthene	U	0.00	333	666	ug/kg	2.0	RLC	04/01/98	1135	119164	1
Acenaphthylene	U	0.00	333	666	ug/kg	2.0					
Anthracene	U	0.00	333	666	ug/kg	2.0					
Benzo(a)anthracene	U	0.00	333	666	ug/kg	2.0					
Benzo(a)pyrene	U	0.00	333	666	ug/kg	2.0					
Benzo(b)fluoranthene	U	0.00	333	666	ug/kg	2.0					
Benzo(ghi)perylene	U	0.00	333	666	ug/kg	2.0					
Benzo(k)fluoranthene	U	0.00	333	666	ug/kg	2.0					
Chrysene	U	0.00	333	666	ug/kg	2.0					
Dibenzo(a,h)anthracene	U	0.00	333	666	ug/kg	2.0					
Fluoranthene	U	0.00	333	666	ug/kg	2.0					
Fluorene	U	0.00	333	666	ug/kg	2.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	333	666	ug/kg	2.0					
Naphthalene	U	0.00	333	666	ug/kg	2.0					
Phenanthrene	U	0.00	333	666	ug/kg	2.0					
Pyrene	U	0.00	333	666	ug/kg	2.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/30/98 1445 119164 2

Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

