N61165.AR.005722
CNC CHARLESTON
5090.3a

UNDERGROUND STORAGE TANK (UST) REMOVAL ASSESSMENT TANK NUMBER 2 WITH SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL REVIEW LETTER CNC CHARLESTON SC
05/17/1991
GEO SERVICES

South Carolina
DHEC
Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201

File

13370

May 17, 1991

CNRTC

Mr. Daryl Fontenot
South Naval Facilities Engineering Command
2155 Eagle Drive
P. O. Box 10068
Charleston, SC 29411-0068

Re: Underground Tank Removal Assessment - Tank No. 2
CNRTC—Naval Reserve Training Center
Charleston Naval Base
Charleston, SC 29408-5900

Dear Mr. Fortenot:

The South Carolina DHEC has reviewed the underground tank closure assessment for the one thousand (1,000) gallon unregulated No. 2 fuel oil tank located at the referenced facility. Soil sample designated Tank No. 2 East collected from the capillary zone (7 to 9 ft.) reveals a concentration of total petroleum hydrocarbon at two thousand five hundred (2,500) parts per million (ppm).

Based on the results, the potential for groundwater impact does exist at the site. Further investigation to determine the probable fate, extent and severity of impact to both soil and groundwater needs to be addressed.

Consequently, the Department requests that the Naval Base submit as a minimum the following on or before July 5, 1991:

1. Initial site characterization - This should include data concerning the surrounding populations, water quality, drinking water wells, soil conditions, public utilities, land use, and an estimated quantity of the release.

2. Soil investigation - This should include a summary of methods being utilized to determine the full extent and location of soil contamination.

3. An assessment plan which addresses:

   a) Proposed monitoring well locations on a scaled site map and construction details for the proposed monitoring wells. A minimum of three shallow wells are required for groundwater flow triangulation, one deep well may be necessary to determine the vertical extent of contamination;

   b) Sampling methods and analytical protocol;

   c) Aquifer tests; and

   d) Implementation schedule.

All geological reports must be signed by a South Carolina registered geologist.

The report (2 copies) must be submitted to the attention of David Baize, Assessment and Development Section, Groundwater Protection Division, South Carolina DHEC, 2600 Bull St., Columbia, SC 29201.

If there are any questions, please feel free to contact me at 554-5533.

Sincerely,

Christine M. Sanford-Coker

Christine M. Sanford-Coker
Regional Hydrogeologist
Trident District EQC

CMSC/dl

cc: David Baize, Groundwater Protection Division
John Sneed, Charleston Naval Base

DEPARTMENT OF THE NAVY
CHARLESTON NAVAL SHIPYARD
NAVAL BASE
CHARLESTON, S. C. 29408-6100

File IM
JAM 06 IN

5090
Ser 462.1/118
25 JAN 1991

South Carolina Department of Health
and Environmental Control
Attn : Christine Coker
2470 Air Park Road
Charleston, SC 29418

Dear Ms. Coker:

In confirmation of your phone conversation with Bill Gates of the shipyard Environmental Protection Division, recently four nonregulated underground storage tanks (UST) were removed by a contractor working for the Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). Soil samples from two of the tanks gave total petroleum hydrocarbon readings indicating the possibility of soil contamination. Enclosures (1) and (2) provide details.

The assessment of contamination will be conducted by a contractor working for SOUTHNAVFACENGCOM. Point of contact for details on the scope of work, timetables, etc., for assessment is Daryl Fontenot, SOUTHNAVFACENGCOM, at 743-5519.

Sincerely,

J. W. SNEED
Head, Environmental
Protection Division
By direction of the Commander
Charleston Naval Shipyard

Encl:
(1) UST Removal for Naval Reserve Training Center
(2) UST Removal and Closure In Place for Fleet and Mine Warfare Training Center

THIS DOCUMENT PREPARED FOR:

MR. DWIGHT CARGILE
HEAD CONTRACTING OFFICER
ENVIRONMENTAL CONTRACTS BRANCH
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DRIVE
P. O. BOX 10068
CHARLESTON, SOUTH CAROLINA 29411-0068

REGARDING:

UST REMOVAL
PROJECT NO. USN900820SCC(RTC)
CONTRACT NO. N62467-90-M-0814
NAVAL RESERVE TRAINING CENTER
NAVAL BASE
CHARLESTON, SOUTH CAROLINA 29408-5900

PREPARED BY:

KRIS BANCROFT, RPG PE CHMM
GEO SERVICES
P. O. BOX 444
HIXSON, TENNESSEE 37343

PHONE: (615) 877-8301

Enclosure(1)

USN900816SCC(RTC)

SUMMARY OF UST SYSTEM EXTRACTION

INTRODUCTION:

GEO Services was called to the location of the United States Navy Reserve Training Center, which is located on Hobson Avenue, in Building RTC-1, on the Naval Base, in the City of Charleston, County of Berkely, South Carolina, to assess the feasibility of removing two (2) each one thousand gallon (1,000) capacity, steel underground storage tanks (USTs), and associated product lines. A contract proposal to provide this service was submitted by GEO Services, and accepted by the Naval Facilities Engineering Command. Contact was made by telephone to the SCDHEC, in Columbia, South Carolina, regarding an Application for Permanent Closure of Underground Storage Tank Systems.

GEO Services was informed that this application was unnecessary because the subject USTs were "unregulated", in that they were used to store No. 2 ~~fuel oil~~, which served a ~~boiler~~, that has been converted to recieve steam from the City of Charleston.

The techniques and procedures implemented in the completion of this task either meet or exceed current regulations and standardized practices defined by the NAVFAC Specification No. 06-90-0814, US EPA, the State of South Carolina, API, NFPA, NIOSH, OSHA, ASTM, and NCEP.

SITE FEATURES & LOCATION:

Sketches depicting the subject Site are presented in Appendix A of this report, and should be referenced for purposes of clarification.

The Naval Reserve Training Center is located on the East side of Hobson Avenue, and borders on the Cooper River. All property in the area is controlled by, and under the jurisdiction of, the United States Navy.

The subject Site is situated on level ground. The subject Site is on well-drained terrain, which slopes approximately 2^{o} downward toward the East.

The soil composition in the excavation conducted to facilitate the physical extraction of the USTs is described

in in the "STRATIGRAPHIC TABLE", located in Appendix B of this report. These evaluations are consistent with other soil sample analyses made near the subject Site.

There are no known drinking water wells (the facility is supplied by public utilities), or dairies in the area.

FUEL FACILITY DESCRIPTION FOR TANK NO. 1 & TANK NO. 2:

Numerous sketches depicting the subject Site are included in Appendix A of this report, and should be referenced for the purpose of clarification.

The UST designated as "Tank No. 1" was installed to supply No. 2 fuel oil to a boiler that was moved as additions to the building were effected. The UST designated as "Tank No. 2" was used to supply No. 2 fuel oil to the relocated boiler. The boiler was removed when steam supply was accomplished by the City of Charleston.

The linear centerlines of both USTs were oriented in a East-West direction. Structural integrity of the building has not been compromised as a result of this activity.

UST REMOVAL PROCESS FOR TANK NO. 1:

The activity to commence removal by physical extraction the aforedescribed UST began on 7 November 1990.

Electrical service to the UST system had been neutralized and removed before the arrival of GEO Services personnel.

Tank No. 1 was pumped to within one inch of the bottom by AAA Petroleum Tank Services, Incorporated. The fluid removed from the tank contained miniscule amounts of water and sludge (less tnan 1 inch.)

Tank No. 1 was installed under concrete, and located immediately South of the Northernmost wing of Building RTC-1.

The physical dimensions of Tank No. 1 were 4'-0" in diameter by 11'-0" in length. These dimensions correspond to an UST having a 1,000 gallon capacity, which is in agreement with the information supplied by NAVFAC. The composition of the UST was asphalt coated mild steel.

The fill neck was 3'-0" in length--the top of which was approximately 4" below grade. Product had been extracted through two (2) each .375" diameter copper lines (one serving as a back-up and return line to the other). The vent line was constructed of galvanized steel and ran directly Northward to the Southern wall of the Northernmost wing of Building RTC-1. The vertical standard of the vent line was clamped to the building. The product line was opened for draining. No product was recovered from the product line.

The UST designated as Tank No. 1 still bore most of the original asphalt coating. All product piping (previously converted to copper), showed no signs of corrosion.

The extraction was effected in accordance with NAVFAC Specification 06-90-0814, the US EPA and the State of South Carolina regulations, as well as API, NFPA, NIOSH, OSHA, NCEP, and ASTM standardized practices and guidelines.

Excavation to expose the top of the UST was accomplished.

The soil extracted from the excavation was piled immediately to the South side of the pit, atop concrete pavement. The vent line was removed.

The product delivery lines were disconnected at unions. Preparation was made to trap the fluids contained therein, but the lines were dry. The product lines were removed.

The vent line was plugged, the fill neck was capped with a vented plug (.125 inch diameter drilled holes), and a plastic bag was tied and taped over the neck of the product line couplings.

The UST was lifted from the pit and scraped free of dirt. The project number was spray-painted on two sides using high-visibility enamel.

The UST was inerted by AAA Petroleum Tank Services, Incorporated, and was then extracted and transported to an open area at the facility. The UST was loaded aboard a flat bed trailer for transfer to a facility controlled by AAA Petroleum Tank Services, Incorporated. The area where the UST was placed is under lockable fence and not in the immediate proximity of normal traffic or dwellings of any order.

The UST showed signs of deterioration in the form of rust; however, it still bore the traces of the manufacturers

asphalt coating. All piping appeared to be integrous in that there was no evidence of pipe joint compound compromise, or corrosion. There was evidence of seepage at the fill neck bushing.

The UST pit was moist, but contained no groundwater or seepages.

UST REMOVAL PROCESS FOR TANK NO. 2:

Tank No. 2 was installed under turf, and located between the middle and Southernmost wing of Building RTC-1.

Electrical service to the UST system had been neutralized and removed before the arrival of GEO Services personnel.

Tank No. 2 was pumped to within one inch of the bottom by AAA Petroleum Tank Services, Incorporated. The fluid removed from the tank contained approximately 60 gallons of oil, water, and sludge.

The physical dimensions of Tank No. 2 were 4'-0" in diameter by 10'-10" in length. These dimensions approximately correspond to an UST having a 1,000 gallon capacity, which is in agreement with the information supplied by NAVFAC. The composition of the UST was asphalt coated mild steel.

The fill neck was 3'-0" in length. It had been removed prior to the extraction process, and was buried at a depth approximate to the top of Tank No. 2. Product had been extracted through two (2) each .375" diameter copper lines (one serving as a back-up and return line to the other). The vent line was constructed of galvanized steel and ran directly Northward to the Southern walls of the middle wing of Building RTC-1. The vertical standard of the vent line was clamped to the building. The product line was opened for draining. No product was recovered from the product line. All product piping (previously converted to copper), showed no signs of corrosion.

The extraction was effected in accordance with NAVFAC Specification 06-90-0814, the US EPA and the State of South Carolina regulations, as well as API, NFPA, NIOSH, OSHA, NCEP, and ASTM standardized practices and guidelines.

Excavation to expose the top of the UST was accomplished.

The soil extracted from the excavation was piled to the North side of the pit, Eastward of the middle wing, atop asphalt pavement. The vent line was removed.

The product delivery lines were disconnected at unions. Preparation was made to trap the fluids contained therein, but the lines were dry.

The vent line was plugged, the fill neck was closed with a wooden bung, and the product lines were snubbed.

The UST was lifted from the pit and scraped free of dirt. The project number was spray-painted on two sides using high-visibility enamel. Wooden dowells were modified to use in plugging the numerous point source corrosion holes in the tank.

The UST was inerted by AAA Petroleum Tank Services, Incorporated, and was then extracted and transported to an open area at the facility. The UST was loaded aboard a flat bed trailer for transfer to a facility controlled by AAA Petroleum Tank Services, Incorporated. The area where the UST was placed is under lockable fence and not in the immediate proximity of normal traffic or dwellings of any order.

The UST showed signs of severe deterioration in the form of rust and poins source corrosion on the Easternmost end; however, it still bore the much of the manufacturers asphalt coating. All piping appeared to be integrous in that there was no evidence of pipe joint compound compromise, or corrosion. Evidence of seepage at the fill neck bushing was impossible to ascertain.

The UST pit was heavily moist, but contained no groundwater or seepages.

SOIL SAMPLING PROCEDURES:

One (1) each soil sample was retrieved from each end of the UST pits. A freshly cleaned hand corer was used to collect the soil samples. The samples were retrieved from points approximately two feet below the bottom of the UST pits. One sample each was taken from the East and West ends of the pits. A total of four (4) samples were taken.

These representative soil samples were placed in sterile glass jars with non-reactive (teflon-lined) lids, and stored

on ice (maintaining a temperature at or below 4° C), until they were received by Technical Laboratories, Incorporated, of Chattanooga, Tennessee. A chain of custody letter is provided in Appendix C of this report.

Personnel retrieving samples wore new, disposable gloves for each retrieval. Sampling equipment was vigorously scrubbed in petroleum emulsifier (Sparkleen), and strong detergent after each use.

The UST pits were filled with clean soil. Four (4) inches of concrete was lain over the excavation to extract Tank No. 1. Grass seed was sown liberally over the general area and excavation to extract Tank No. 2.

SOIL SAMPLING PROCEDURES:

The representative soil samples were placed in sterile glass jars with non-reactive (teflon-lined) lids, and stored on ice (maintaining a temperature at or below 4° C), until they were received by Technical Laboratories, Incorporated, of Chattanooga, Tennessee. A chain of custody letter is provided in Appendix C of this report.

Personnel retrieving samples wore new, disposable gloves for each retrieval. Sampling equipment was vigorously scrubbed in petroleum emulsifier (Sparkleen), and strong detergent, then steam cleaned, after each use.

The soil samples which were placed in the sterile glass jars, capped with non-reactive lids, and were transported to a State-approved laboratory and analyzed for total petroleum hydrocarbon (TPH) content.

ANALYTICAL METHODS:

The hydrocarbon content was assessed using by EPA Method 418.1. The determinants are expressed as Total Petroleum Fuel Hydrocarbons in parts per million (ppm).

ANALYTICAL RESULTS:

On 16 November 1990, results of soil analyses were related to GEO Services. At that time, GEO Services called and

advised personnel at the facility and at the Naval Facilities Engineering Command of the analytical results of the soil samples retrieved from the bottoms of the UST pits. Reports of the analytical results are found in Appendix C of this report and are given below.

Soil tests increments are expressed in parts per million (ppm) of total petroleum hydrocarbons (TPH). Two of the samples (one from each UST pit), were analyzed for pH values.

Sample Location	TPH
USN900820SCC(RTC)	
Tank No. 1	
East	10
West	20
USN900820SCC(RTC)	
Tank No. 2	
East	2,500
West	30

SYNOPSIS OF FINDINGS:

The following summary provides an overview of the findings of this investigation and is based on the data and methods explained in this report. This summary should not be separated from the overall report.

The data collected and the analyses performed indicate:

TPH LEVELS

In the sample retrieved from the West end of UST pit Tank No. 1, the TPH level is recorded at 20 ppm. In the sample retrieved from the East end of UST pit at Tank No. 1, the TPH level is recorded at 10 ppm. In the sample retrieved from the West end of UST pit Tank No. 2, the TPH level is

recorded at 30 ppm.These values are below the reaction levels established by the US EPA and the State of South Carolina.

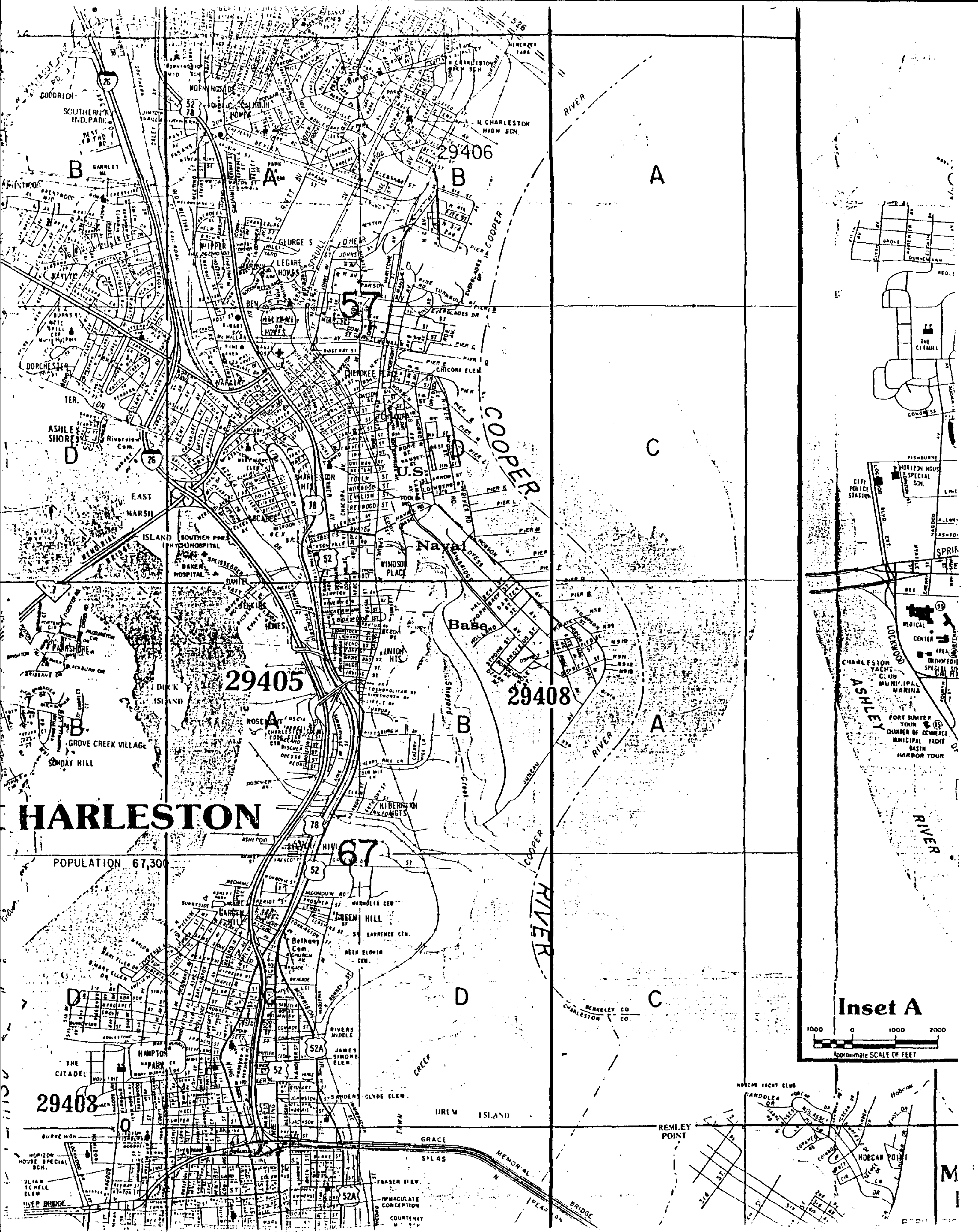
In the sample retrieved from the Ease end of UST pit Tank No. 2, the TPH level is recorded at 2,500 ppm. This value is above the reaction level established by the US EPA and the State of South Carolina.

EXECUTIVE SUMMARY:

From the evidence retrieved during the UST closure activity of Tank No. 1, it appears that the facility has had no significant impact on the environment of the area. Because this UST was--under the stipulations of the laws of the State of South Carolina--an unregulated storage tank, it is our understanding that it is not necessary to provide the South Carolina Department of Health and Environmental Control with a report covering this UST removal activity.

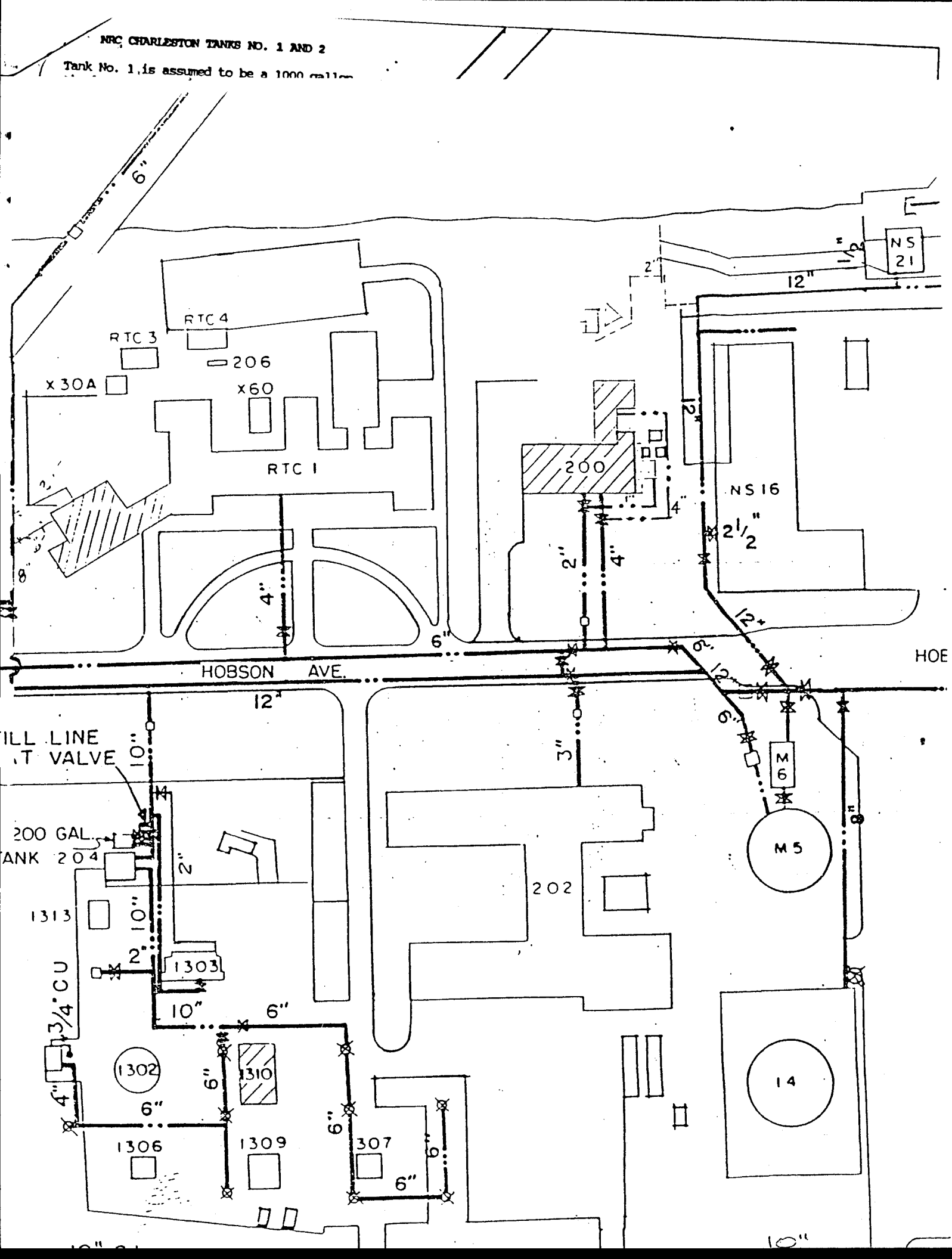
From the evidence retrieved during the UST closure activty of Tank No. 2, it appears that significant and reportable contamination has been promulgated in the area. It is probable that this contamination has emanated from UST designated as Tank No. 2, and it is probable that this contamination has negatively impacted the groundwater in the area. Based on this supposition, the South Carolina Department of Health and Environmental Control should be contacted so they may name and direct those measures as may be necessary to assess and define the qualitative and quantitative environmental impact of hydrocarbon release in the area approximate to UST 647A.

GEO Services is imminently qualified to prepare a complete environmental assessment plan, to the degree of complexity as may be necessary, and to conduct a complete environmental remediation program, that will expediently and economically ameliorate the contaminated soil and groundwater in the area.


HARLESTON
POPULATION 67,300
29406
29405
29408
29403
57
67
A
B
C
D
COOPER
RIVER
ASHLEY
U.S. Naval Base
N CHARLESTON HIGH SCH.
SOUTHERN RY IND. PARK
GOODRICH
DORCHESTER TER.
ASHLEY SHORES
EAST MARSH
ISLAND
DUCK ISLAND
GROVE CREEK VILLAGE
SUNDAY HILL
PARKSHORE
ROSEMONT
HIBERNIAN HGTS
UNION HTS
WINDSOR PLACE
LEGARE HOMES
GARDEN HILL
GREEN HILL
MAGNOLIA CEM
ST. LAWRENCE CEM.
BETH ELOHIM CEM.
Bethany Cem.
RIVERS MIDDLE
JAMES SIMONS ELEM.
SANDERS CLYDE ELEM.
FRASER ELEM.
IMMACULATE CONCEPTION
HAMPTON PARK
THE CITADEL
DRUM ISLAND
GRACE MEMORIAL BRIDGE
SILAS PEARMAN BRIDGE
REMLEY POINT
BERKELEY CO
CHARLESTON CO
HOBCAW POINT
HOBCAW YACHT CLUB
CHARLESTON YACHT CLUB
MUNICIPAL MARINA
FORT SUMTER TOUR
CHAMBER OF COMMERCE
MUNICIPAL YACHT BASIN
HARBOR TOUR
MEDICAL CENTER
CITY POLICE STATION
HORIZON HOUSE SPECIAL SCH.
LOCKWOOD
Inset A
Approximate SCALE OF FEET
1000 0 1000 2000

NRC CHARLESTON TANKS NO. 1 AND 2

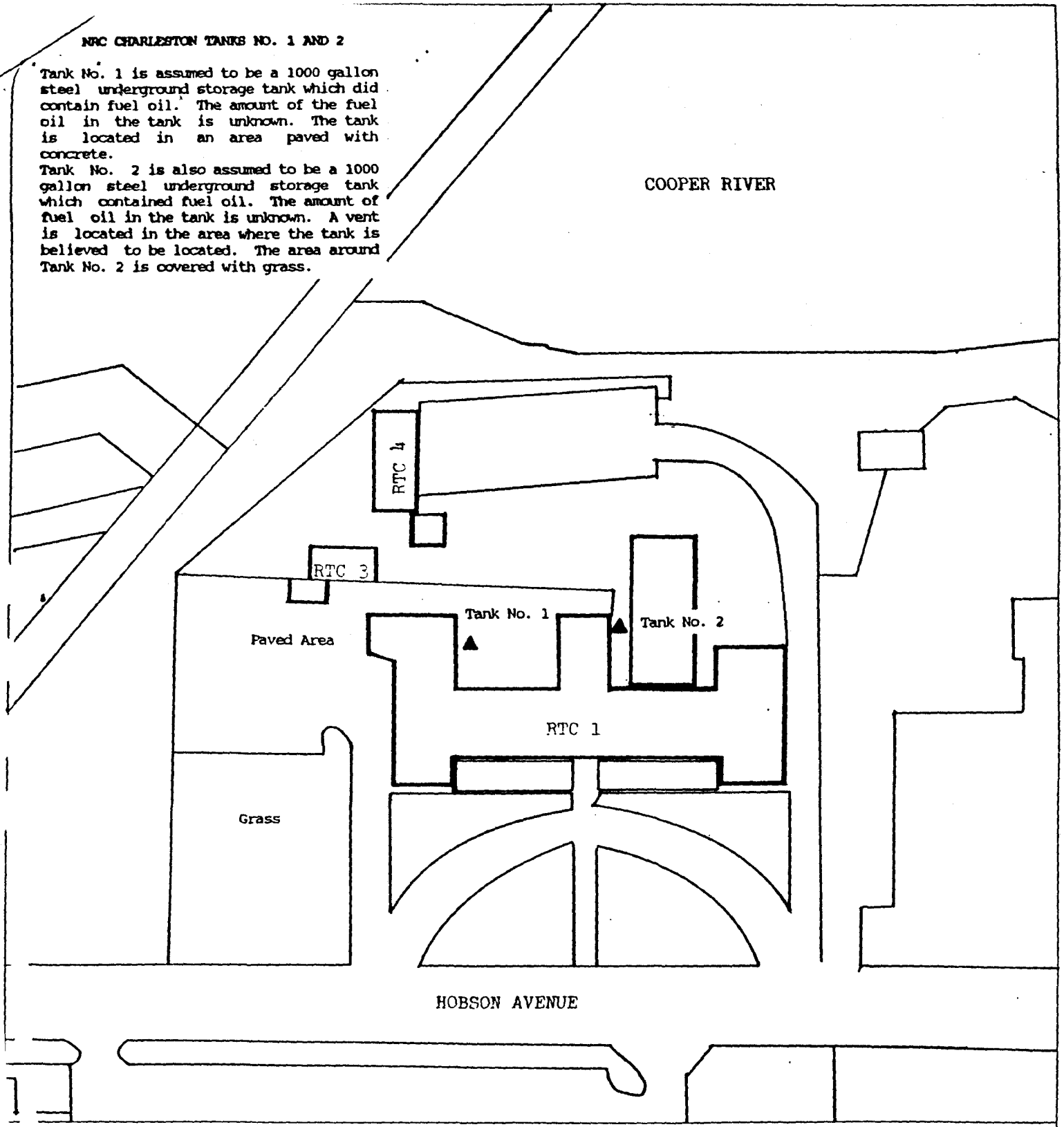
Tank No. 1 is assumed to be a 1000 gallon



NRC CHARLESTON TANKS NO. 1 AND 2

Tank No. 1 is assumed to be a 1000 gallon steel underground storage tank which did contain fuel oil. The amount of the fuel oil in the tank is unknown. The tank is located in an area paved with concrete.

Tank No. 2 is also assumed to be a 1000 gallon steel underground storage tank which contained fuel oil. The amount of fuel oil in the tank is unknown. A vent is located in the area where the tank is believed to be located. The area around Tank No. 2 is covered with grass.



DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION · Charleston, S.C.

Prepared by D. L. Fontenot

Approved by

Date 24 MAY 1990

REMOVAL OF UNDERGROUND FUEL STORAGE TANKS AT THE NAVAL RESERVE CENTER, CHARLESTON, SOUTH CAROLINA

Addendum/Amendment No. Sketch No. "A"

Scale None Spec. No. 06-09-0814 Contract No. N62467-90-C-0814

SOUTHNAVFACENGCOM 11012.18 (REV. 7-86) CAROLINA E&F P-462

Appendix B

USN900816SCC(RTC)

STRATIGRAPHIC TABLE:

Excavation for UST Tank No. 1

Depth in Ft.	Composition
0.0--0.7	Concrete and pug fill.
0.7--9.1	Grey sand, silty admix with bivalve fragments. Wood, asphalt-like and brick rubble.

Appendix C

GEO Services
P.O. Box 444
Hixson, Tennessee 37343
Phone: (615) 877-830

PLEASE CALL WHEN ANALYSES COMPLETE

CHAIN OF CUSTODY RECORD

PROJECT NO.
USN900820 SCC RTC 1

CLIENT NAME
UNITED STATES NAVY

SAMPLERS NAME & SIGNATURE
KRIS BANCROFT Kris Bancroft

REMARKS
TPH ONLY

STA. NO.	SAMPLE NO.	DATE	TIME	CONTAINER NO.	COMPOSITION	STATION LOCATION
UST 1	1	11/8	1320	1	Silty Sand	East
" "	2	" "	1325	2	" "	"
" "	1	" "	1330	3	" "	West
" "	2	" "	1335	4	" "	"
UST 2	1	11/9	0015	5	" "	East
" "	2	" "	0020	6	" "	"
" "	1	" "	0025	7	" "	West
" "	2	" "	0030	8	" "	"
" "						

RELINQUISHED BY (SIGNATURE) Kris Bancroft	DATE/T 11/12 12:5
RECEIVED BY (SIGNATURE) Monty Webb	DATE/T 11/12 9:1 /12
RELINQUISHED BY (SIGNATURE)	DATE/T
RECEIVED BY (SIGNATURE)	DATE/
RELINQUISHED BY (SIGNATURE)	DATE/
RECEIVED BY (SIGNATURE)	DATE/

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.
CHATTANOOGA, TENNESSEE 37405
615/265-4533

MARTIN H. DAVIS
President

ACCOUNT NO.	2813-001 **DATE** NOVEMBER 16, 1990
RECEIVED FROM	GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343 MR. KRIS BANCROFT
RECEIVED DATE	11/12/90
MATERIAL	SOIL
MARKED	UNITED STATES NAVY, PROJECT NO. USN900820SCCRTC1, STA. NO. UST1, COMPOSITE SAMPLES NO. 1 & 2 WEST, 11/08/90, 1330
LABORATORY NO.	307,085

Total Petroleum Hydrocarbons ppm	20

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

MARTIN H. DAVIS
President

ibc

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.

MARTIN H. DAVIS
President

CHATTANOOGA, TENNESSEE 37405

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCRTC1, STA. NO. UST1, COMPOSITE SAMPLES NO. 1 & 2 EAST, 1320

LABORATORY NO. 307,083

Total Petroleum Hydrocarbons ppm	10

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

MARTIN H. DAVIS
President

ibc

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.
CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCRTC1, STA. NO. UST2, COMPOSITE SAMPLES NO. 1 & 2 WEST, 11/09/90, 0025

LABORATORY NO. 307,089

Total Petroleum Hydrocarbons ppm	30

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

MARTIN H. DAVIS
President

ibc

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.
CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCRTC1, STA. NO. UST2, COMPOSITE SAMPLES NO. 1 & 2 EAST, 11/09/90, 0015

LABORATORY NO. 307,087

Total Petroleum Hydrocarbons ppm	2,500

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

MARTIN H. DAVIS
President

ibc

USN900816SCC(RTC)

AUTHORIZATION OF REPORT

This is a confidential report, solely for the use of the United States Navy (herein referred to as the "Client.") This report should not be released or disclosed to any other party without the prior written consent of GEO Services.

The synopsis of the services performed for the Client at their Naval Reserve Training Center, in Charleston, South Carolina, facility (herein referred to as the "Site"), is enclosed in the body of this report. The survey, and all related work performed by GEO Services does not represent, warrant, certify, or imply that (i) all the hazardous or toxic materials on the Site, above or below ground, at the time the survey was performed are qualified or quantified herein; (ii) that any local, state, or federal regulations appertaining to the environment have not been violated in such a manner as to incumber the Client with legal penalties, civil suit, or criminal liabilities; (iii) that environmental management at the Site will not be the subject of future investigations by local, state, or federal environmental authorities.

This report describes conditions observed at the Site on 7 & 8 November 1990. GEO Services did not perform systematic monitoring. The decision not to perform systematic monitoring does not constitute a representation, warranty, or opinion that situations technically significant (or significant under environmental regulations), should not be undertaken. Observations reported relate solely to the information available on the day(s) the Site was observed and to information made available by the regulatory authorities. GEO Services does not give any opinion or information pertaining to the condition of the Site prior to or subsequent to the date of this report. This is a limited and qualified opinion of GEO Services, and the statements or descriptions given in this report are for informational purposes only, and are not made or given as warranty. No representations pertaining to the Site are made except those contained in this report. This report shall not constitute an agreement to indemnify or insure against any liability or expense whatsoever.

Kris Bancroft

Kris Bancroft, RPG PE CHMM
GEO Services
P.O. Box 444
Hixson, Tennessee 37343

(615) 877-8301

THIS DOCUMENT PREPARED FOR:

MR. DWIGHT CARGILE
HEAD CONTRACTING OFFICER
ENVIRONMENTAL CONTRACTS BRANCH
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DRIVE
P. O. BOX 10068
CHARLESTON, SOUTH CAROLINA 29411-0068

REGARDING:

UST REMOVAL & CLOSURE IN PLACE
PROJECT NO. USN900820SCC(FMW)
CONTRACT NO. N62467-90-M-0909
FLEET AND MINE WARFARE TRAINING CENTER
NAVAL BASE
CHARLESTON, SOUTH CAROLINA 29408-5200

PREPARED BY:

KRIS BANCROFT, RPG PE CHMM
GEO SERVICES
P. O. BOX 444
HIXSON, TENNESSEE 37343

PHONE: (615) 877-8301

Enclosure (1)

USN900816SCC(FMW)

SUMMARY OF UST SYSTEM EXTRACTION

INTRODUCTION:

GEO Services was called to the location of the United States Navy Fleet And Mine Warfare Training Center, which is located on Bainbridge Avenue, in Buildings 643 and 647 on the Naval Base, in the City of Charleston, County of Berkely, South Carolina, to assess the feasibility of removing one (1) each five hundred-fifty gallon (550) capacity, steel underground storage tank (UST), and associated product lines, and to assess the environmental impact of one (1) each four thousand gallon (4,000) capacity UST that had been previously closed in place (filled with concrete.) A contract proposal to provide these services was submitted by GEO Services, and accepted by the Naval Facilities Engineering Command. Contact was made by telephone to the SCDHEC, in Columbia, South Carolina, regarding an Application for Permanent Closure of Underground Storage Tank Systems.

GEO Services was informed that this application was unnecessary because the subject USTs were "unregulated", in that they were used to store No. 2 fuel oil, which served a heat and power generation system, that has been converted to burn natural gas.

The techniques and procedures implemented in the completion of this task either meet or exceed current regulations and standardized practices defined by the NAVFAC Specification No. 06-90-0909, US EPA, the State of South Carolina, API, NFPA, NIOSH, OSHA, ASTM, and NCEP.

SITE FEATURES & LOCATION:

Sketches depicting the subject Site are presented in Appendix A of this report, and should be referenced for purposes of clarification.

The Fleet And Mine Warfare Training Center is located on the East side of Bainbridge Avenue. All property in the area is controlled by, and under the jurisdiction of, the United States Navy.

The subject Site is situated on level ground. The subject Site is on well-drained terrain, which slopes approximately 4° downward toward the East.

The soil composition in the excavation conducted to facilitate the physical extraction of the UST is described in in the "STRATIGRAPHIC TABLE", located in Appendix B of this report. These evaluations are consistent with other soil sample analyses made near the subject Site.

There are no known drinking water wells (the facility is supplied by public utilities), or dairies in the area.

FUEL FACILITY DESCRIPTION FOR UST 643C:

Numerous sketches depicting the subject Site are included in Appendix A of this report, and should be referenced for the purpose of clarification.

The UST designated as "643C" was installed to supply Number 2 fuel oil to a generator that has been converted to burn natural gas. This generator is part of the electrical service, HVAC, and water heating system in the building.

This UST was installed under turf, immediately East of the building. The linear centerline of the UST was oriented in a East-West direction, approximately twenty (20) feet from the Easternmost wall of the 643 building. Structural integrity of the building has not been compromised as a result of this activity.

The physical dimensions of UST 643C were 4'-0" in diameter by '6-0" in length. These are the dimensions corresponding to an UST having a 560 gallon capacity, which is approximate to the information supplied by NAVFAC. The composition of the UST was asphalt coated mild steel.

The fill neck was 3'-0" in length--the top of which was approximately 2" above grade. Product was extracted through two (2) each .375" diameter copper lines (one serving as a back-up and return line to the other). The vent line was constructed of galvanized steel and ran approximately twenty (20) feet from the UST, surfacing just Eastward of the 643 building. The vertical standard of the vent line was clamped Building 643. The product line was opened for draining. No product was recovered from the product line.

The UST designated as 643C still bore most of the original asphalt coating. All product piping (previously converted to copper), showed no signs of corrosion.

UST 643C REMOVAL PROCESS:

The activity to commence removal by physical extraction the aforedescribed UST facility was accomplished on 7 November 1990.

Electrical service to the UST system was neutralized and removed before the arrival of GEO Services personnel. The UST had been pumped to within one inch of the bottom.

The extraction was effected in accordance with NAVFAC Specification 06-90-0909, the US EPA and the State of South Carolina regulations, as well as API, NFPA, NIOSH, OSHA, NCEP, and ASTM standardized practices and guidelines.

Insertion of a paste-coated probe indicated that the UST contents consisted of miniscule amounts (less than one inch) of petroleum (Number 2 fuel oil). No water was detected inside the UST.

Excavation to expose the top of the USTs was accomplished.

The soil extracted from the 643C excavation was piled immediately to the South side of the pit. The vent line was removed.

The product delivery lines were disconnected at unions. Preparation was made to trap the fluids contained therein, but the lines were dry. The delivery lines were disconnected.

The vent line was plugged, the fill neck was capped with a vented plug (.125 inch diameter drilled holes), and a plastic bag was tied and taped over the neck of the product line couplings.

The UST was lifted from the pit and scraped free of dirt. The project number was spray-painted on two sides using high-visibility enamel.

The UST was inerted by AAA Petroleum Tank Services, Incorporated, and was then extracted and transported to an open area at the facility. The UST was loaded aboard a flat bed trailer for transfer to a facility controlled by AAA

Petroleum Tank Services, Incorporated. The area where the UST was placed is under lockable fence and not in the immediate proximity of normal traffic or dwellings of any order.

The UST showed no signs of deterioration and still bore the majority of the manufacturers asphalt coating. All piping appeared to be integrous in that there was no evidence of pipe joint compound compromise, or corrosion. There was slight evidence of minor seepage at the fill neck bushing.

The UST pit was moist, but contained no groundwater or seepages.

SOIL SAMPLING PROCEDURES FOR UST 643C:

One (1) each soil sample was retrieved from each end of the UST pit. A freshly cleaned hand corer was used to collect the soil samples. The samples were retrieved from points approximately two feet below the bottom of the UST pit. One sample each was taken from the East and West ends of the pit. A total of two (2) samples were taken.

These representative soil samples were divided approximately in half, with one portion from each sampling point placed in sterile glass jars with non-reactive (teflon-lined) lids, and stored on ice (maintaining a temperature at or below 4° C), until they were received by Technical Laboratories, Incorporated, of Chattanooga, Tennessee. A chain of custody letter is provided in Appendix C of this report. The balance of each sample was placed in sterile headspace jars, tightly capped with foil membranes.

Personnel retrieving samples wore new, disposable gloves for each retrieval. Sampling equipment was vigorously scrubbed in petroleum emulsifier (Sparkleen), and strong detergent after each use.

The soil samples which were placed in the sterile glass jars, capped with non-reactive lids, and were transported to a State-approved laboratory and analyzed for total petroleum hydrocarbon (TPH) content.

The headspace samples were placed in an environment with ambient temperature above 70° F for a minimum of one half hour, and were then field tested with a calibrated H-Nu meter. The H-Nu meter gave minor indication of the presence of volatile organic materials. A reading of 6 was recorded

on the sample taken from the West end of the UST pit, while a reading of 11 was recorded on the sample taken from the East end of the UST pit.

The UST pit was filled with clean soil. Grass seed was sown liberally over the excavation.

FUEL FACILITY DESCRIPTION FOR UST 647A:

Numerous sketches depicting the subject Site are included in Appendix A of this report, and should be referenced for the purpose of clarification.

The UST designated as "647A" was installed to supply Number 2 fuel oil to a generator that has been converted to burn natural gas. This generator is part of the electrical service, HVAC, and water heating system in the building.

This UST was installed under concrete and asphalt, immediately East of the building. The linear centerline of the UST was oriented in a East-West direction, approximately two (2) feet from the Easternmost wall of the 647 building. Structural integrity of the building has not been compromised as a result of this activity.

The physical dimensions of UST 643C were assumed to be 5'-4" in diameter by '24-0" in length. These are the dimensions corresponding to an UST having a 4,000 gallon capacity, as the data on the facility indicated. The composition of the UST was reported to be asphalt coated mild steel.

The fill neck was assumed to be 3'-0" in length--the top of which was approximately 4" above grade. A probe inserted into the fill neck opening contacted firm resistance at 18". Product had been extracted through two (2) each .500" diameter copper lines (one serving as a back-up and return line to the other), which had been snubbed and grouted prior to the arrival of GEO Services personnel. The vent line was constructed of galvanized steel and ran approximately twenty (2) feet from the UST, surfacing just Eastward of the 647 building. The vertical standard of the vent line was clamped Building 647.

USN900816SCC(FMW)

SOIL SAMPLING PROCEDURES FOR UST 647A:

Samples taken at the four corners of UST pit 647A were obtained by accomplishing free-flight hollow-stemmed auger borings, not more than two feet from the assumed dimensions of the UST. Samples were taken in 18" split spoons, at intervals less than five feet (5') from the beginning of one sample to the ending of the next. ASTM Standard Method D1586-84 was used to accomplish this task. A record of these borings is presented on Boring Logs, found in Appendix C of this report. A freshly cleaned hand corer was used to collect the soil samples. The samples were retrieved from points approximately two feet from the corners of the UST pit. Three (3) samples were taken from each of the four test borings, at the depths 3.5'-5.0', 8.5'-10.0', and 13.5'-25.0', respectively. A total of twelve (12) samples were taken from UST pit 647A.

These representative soil samples were placed in sterile glass jars with non-reactive (teflon-lined) lids, and stored on ice (maintaining a temperature at or below 4° C), until they were received by Technical Laboratories, Incorporated, of Chattanooga, Tennessee. A chain of custody letter is provided in Appendix C of this report.

Personnel retrieving samples wore new, disposable gloves for each retrieval. Sampling equipment was vigorously scrubbed in petroleum emulsifier (Sparkleen), and strong detergent, then steam cleaned, after each use.

The soil samples which were placed in the sterile glass jars, capped with non-reactive lids, and were transported to a State-approved laboratory and analyzed for total petroleum hydrocarbon (TPH) content.

The bore holes were grouted after samples had been retrieved.

ANALYTICAL METHODS:

The hydrocarbon content was assessed using by EPA Method 418.1. The determinants are expressed as Total Petroleum Fuel Hydrocarbons in parts per million (ppm).

On 16 November 1990, results of soil analyses were related to GEO Services. At that time, GEO Services called and advised personnel at the facility and at the Naval Facilities Engineering Command of the analytical results of the soil samples retrieved from the bottoms of the UST pits. Reports of the analytical results are found in Appendix C of this report and are given below.

Soil tests increments are expressed in parts per million (ppm) of total petroleum hydrocarbons (TPH). Two of the samples (one from each UST pit), were analyzed for pH values.

Sample Location	TPH
USN900820SCC(FMW) Tank No. 643C East	30
USN900820SCC(FMW) Tank No. 643C West	30
USN900820SCC(FMW) Tank No. 647A	
Sample B-1-1 3.5-5.0	10
Sample B-1-2 8.5 10.0	10
Sample B-1-3 13.5-25.0	10
Sample B-2-1	60
Sample B-2-2	10
Sample B-2-3	20
Sample B-3-1	860
Sample B-3-2	740
Sample B-3-3	60
Sample B-4-1	30
Sample B-4-2	30
Sample B-4-3	10

USN900816SCC(FMW)

SYNOPSIS OF FINDINGS:

The following summary provides an overview of the findings of this investigation and is based on the data and methods explained in this report. This summary should not be separated from the overall report.

The data collected and the analyses performed indicate:

TPH LEVELS

In the sample retrieved from the East of UST pit 643C, the TPH level is recorded at 30 ppm. In the sample retrieved from the West end of UST pit 643C, the TPH level is also recorded at 30 ppm. These values are below the reaction levels established by the US EPA and the State of South Carolina.

In the samples taken from the test borings at the corners of UST pit 647A, reportable TPH levels are detected. The maximum reading is 860 ppm, and corresponds to the 3.5'-5.0' interval of boring sample B-3-1.

EXECUTIVE SUMMARY:

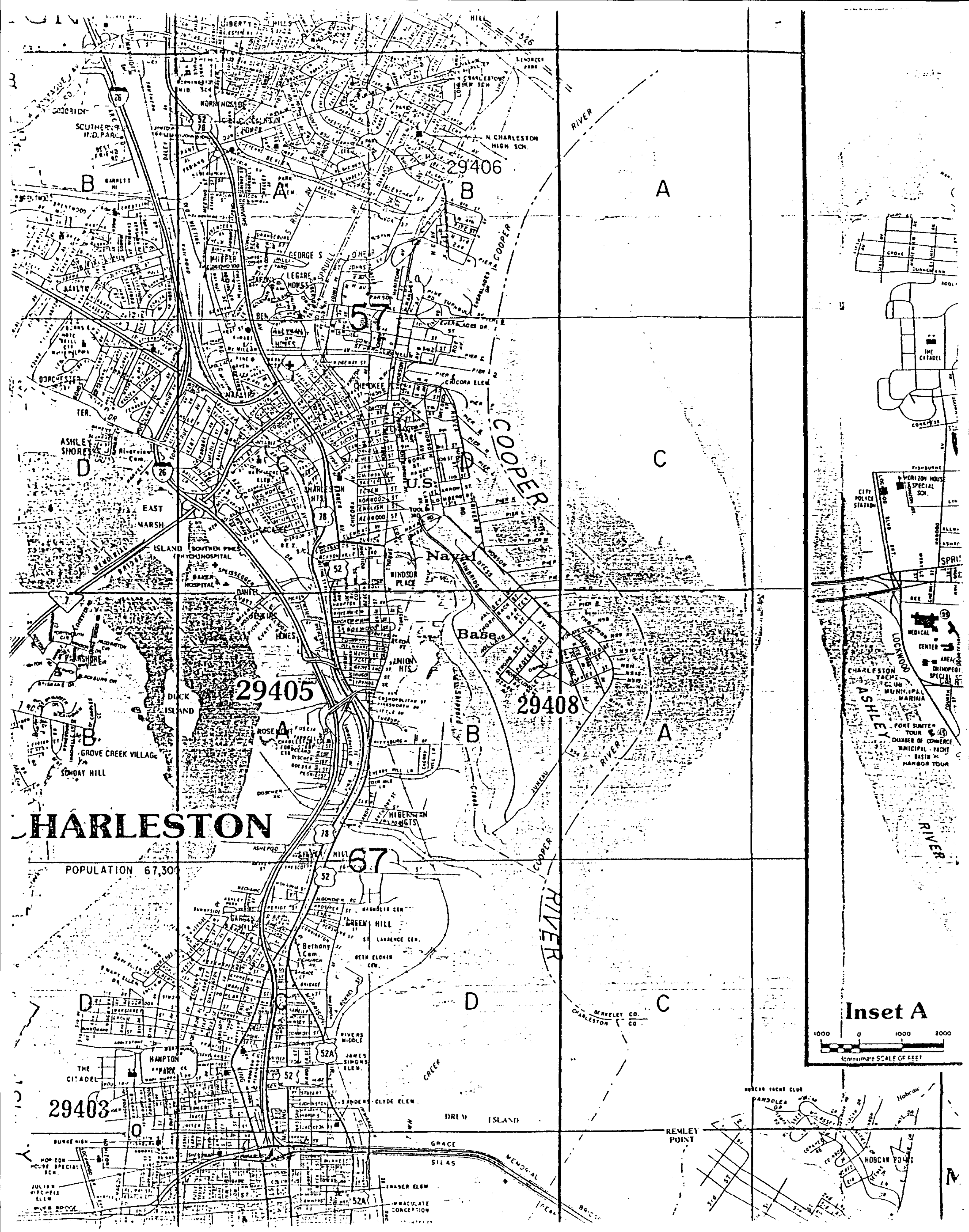
From the evidence retrieved during the UST closure activity, it appears the 643C facility has had no significant impact on the environment of the area. Because this UST was--under the stipulations of the laws of the State of South Carolina--an unregulated storage tank, it is our understanding that it is not necessary to provide the South Carolina Department of Health and Environmental Control with a report covering this UST removal activity.

From the evidence retrieved during the Environmental Site Check at the 647A facility, it appears that significant and reportable contamination has been promulgated in the area. It is probable that this contamination has emanated from UST 647A, and it is probable that this contamination has negatively impacted the groundwater in the area. Based on this supposition, the South Carolina Department of Health and Environmental Control should be contacted so they may name and direct those measures as may be necessary to assess and define the qualitative and quantitative environmental

impact of hydrocarbon release in the area approximate to UST 647A.

GEO Services is imminently qualified to prepare a complete environmental assessment plan, to the degree of complexity as may be necessary, and to conduct a complete environmental remediation program, that will expediently and economically ameliorate the contaminated soil and groundwater in the area.

Appendix A


CHARLESTON
POPULATION 67,30
29406
29405
29408
29403
57
67
A
B
C
D
LIBERTY HILLS
MORNINGSIDE
N. CHARLESTON HIGH SCH.
COOPER RIVER
U.S. Naval Base
CHICORA ELEM
CHARLESTON HTS
WINDSOR PLACE
ASHLEY SHORES
EAST MARSH
BAKER HOSPITAL
DUCK ISLAND
ROSEMONT
UNION HTS
HIBERNIAN HGTS
GROVE CREEK VILLAGE
SUNDAY HILL
GARDEN HILL
GREEN HILL
Bethany Cem.
HAMPTON PARK
THE CITADEL
RIVERS MIDDLE
JAMES SIMONS ELEM.
SANDERS-CLYDE ELEM.
BURKE HIGH
FRASER ELEM
IMMACULATE CONCEPTION
DRUM ISLAND
GRACE MEMORIAL BRIDGE
SILAS
BERKELEY CO.
CHARLESTON CO.
REMLEY POINT
HOBCAW YACHT CLUB
HOBCAW POINT
CITY POLICE STATION
HORIZON HOUSE SPECIAL SCH.
MEDICAL CENTER
CHARLESTON YACHT CLUB
MUNICIPAL MARINA
FORT SUMTER TOUR
ASHLEY RIVER
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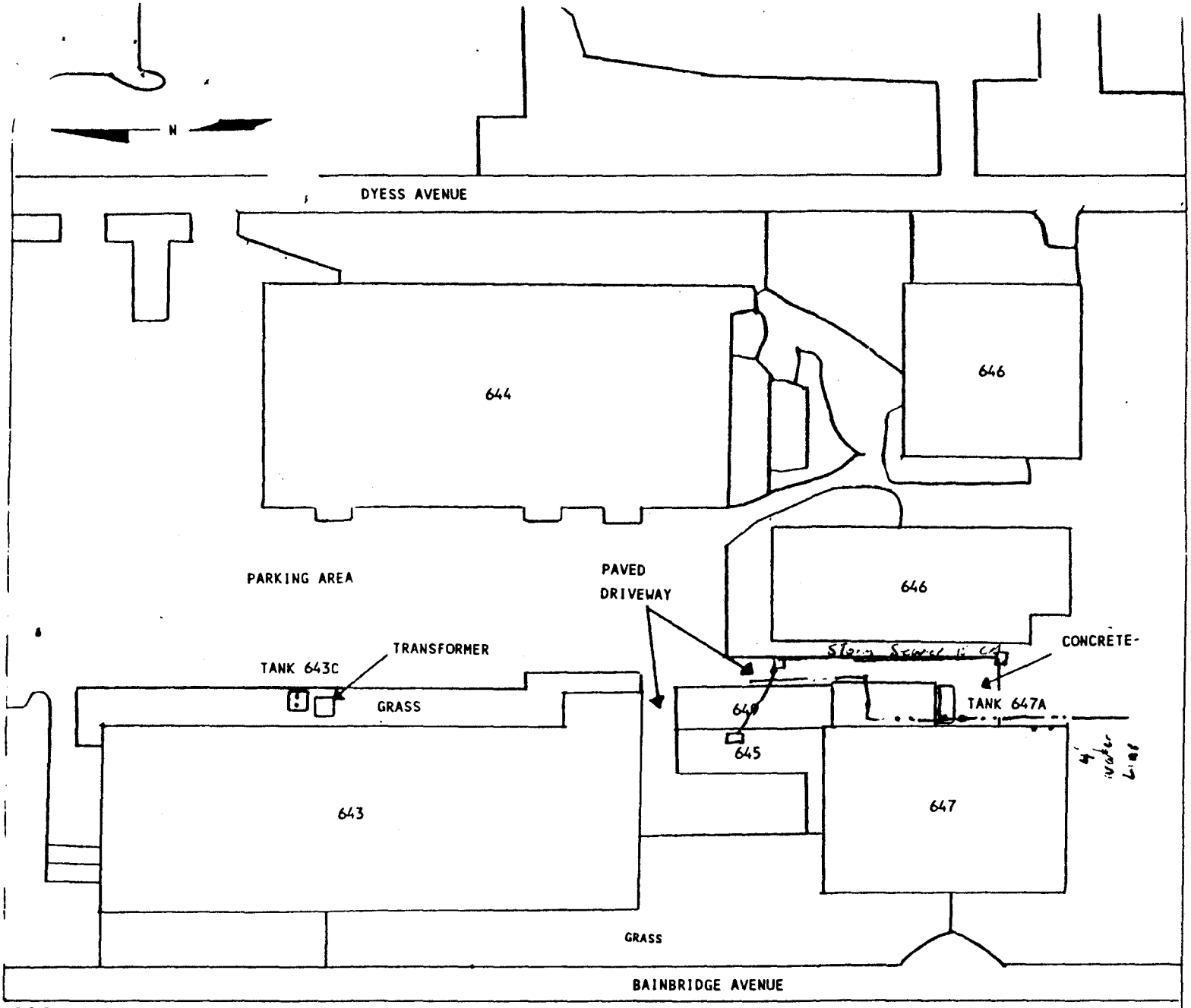


FLEET AND MINE WARFARE TRAINING CENTER CHARLESTON
TANKS 643C AND 647A

Tank 643C is a 550 gallon steel underground storage tank used to store diesel fuel for use in an emergency generator. The tank is over 20 years old and is out of service. The tank currently contains approximately 3 inches of water. No fuel was found present in the tank. The tank is covered with dirt and grass and located adjacent to an electric transformer. The tank is located on the east side of Building 643 near the mechanical room. Tank 643C should be removed from the ground.

Tank 647A is a 4000 gallon steel underground storage tank used to store diesel fuel for use in an emergency generator. The tank is over 20 years old and is out of service. The tank is apparently filled with concrete and contains no fluid. The tank is covered by concrete and the fill is located next to the building. The tank is located on the east side of Building 647 near the mechanical equipment for the building. This tank should be abandoned in place due to the tank being filled with concrete.

DEPARTMENT OF THE NAVY **NAVAL FACILITIES ENGINEERING COMMAND**
SOUTHERN DIVISION · Charleston, S.C.

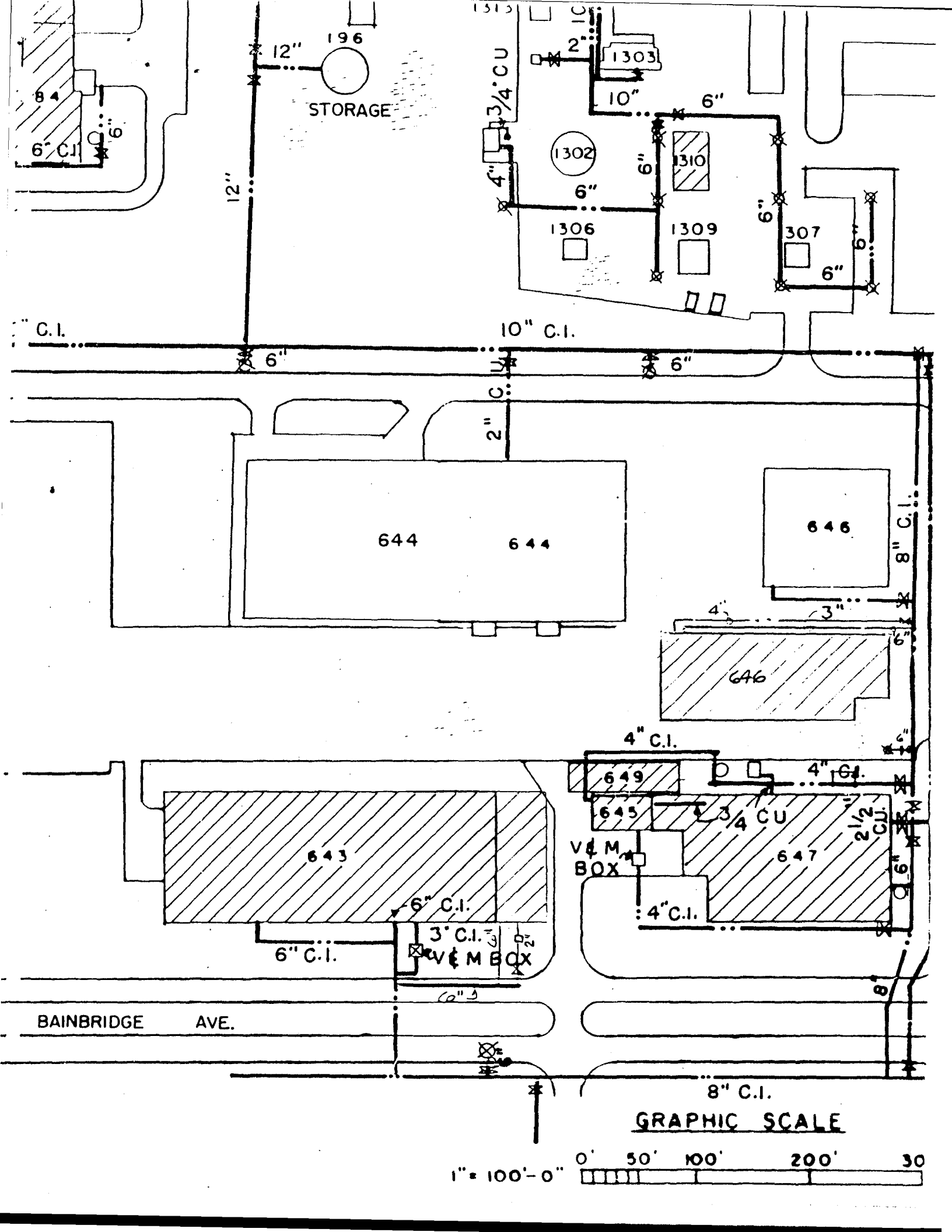
Prepared by D. L. Fontenot
Approved by _____
Date 12 JULY 1990

REMOVAL OF UNDERGROUND STORAGE TANKS AT THE FLEET AND MINE WARFARE TRAINING CENTER CHARLESTON, SOUTH CAROLINA

Addendum/Amendment No. _____ **Sketch No.** "A"

Scale None **Spec. No.** 06-90-0909 **Contract No.** N62467-90-C-0909

SOUTHNAVFACENGCOM 11012.19 (REV. 7-86) CAROLINA E&F P-462


12"
196
STORAGE
12"
6" C.I.
6"
6"
1303
2"
10"
6"
3/4" CU
1302
1310
6"
4"
6"
1306
1309
307
6"
6"
6"
10" C.I.
6"
6"
C.I.
2"
644
644
646
8" C.I.
4"
3"
6"
646
4" C.I.
649
4" C.I.
645
3/4 CU
2 1/2 C.U.
V & M BOX
647
6"
4" C.I.
643
6" C.I.
3" C.I.
6" C.I.
V & M BOX
BAINBRIDGE AVE.
8"
8" C.I.
GRAPHIC SCALE
1" = 100'-0"
0'
50'
100'
200'
30

Appendix B

USN900816SCC(FMW)

STRATIGRAPHIC TABLE:

Excavation for UST 643C

Depth in Ft.	Composition
0.0--1.8	Brown sandy top soil.
1.8--9.1	Grey sand, silty admix with bivalve fragments.

Typical Test Boring for UST 647A

0.0'--0.8'	Concrete/asphalt and pug.
0.8'--12.0'	Grey sand, silty admix wity trace of bivalve fragments.
12.0'-15.0'	Bluish-grey clay marl with black streaks and inclusions.

Appendix C

GEO Services
P.O. Box 444
Hixson, Tennessee 37343
Phone: (615) 877-830

PLEASE CALL WHEN ANALYSES COMPLETE

CHAIN OF CUSTODY RECORD

PROJECT NO.: USN900820SCCFMW

CLIENT NAME: UNITED STATES NAVY

SAMPLERS NAME & SIGNATURE: KRIS BANCROFT Kris Bancroft

STA. NO.	SAMPLE NO.	DATE	TIME	CONTAINER NO.	COMPOSITION	STATION LOCATION
643-C	1	11/8	0810	1	Silty Sand	East
"	2	"	0815	2	" "	"
"	1	"	0820	3	" "	West
"	2	"	0825	4	" "	"

REMARKS: TPH ONLY

RELINQUISHED BY (SIGNATURE) Kris Bancroft	DATE/T 11/12 12
RECEIVED BY (SIGNATURE) Monti Webb	DATE/T 11/12/90 12
RELINQUISHED BY (SIGNATURE)	DATE/T
RECEIVED BY (SIGNATURE)	DATE/
RELINQUISHED BY (SIGNATURE)	DATE/
RECEIVED BY (SIGNATURE)	DATE/

GEO Services
P.O. Box 444
Hixson, Tennessee 37343
Phone: (615) 877-8301
PLEASE CALL WHEN ANALYSES COMPLETE

CHAIN OF CUSTODY RECORD

PROJECT NO.: ISN900820SCCFMW
CLIENT NAME: UNITED STATES NAVY
SAMPLERS NAME & SIGNATURE: KRIS BANCROFT Kris Bancroft

REMARKS: TPH ONLY

STA. NO.	SAMPLE NO.	DATE	TIME	CONTAINER NO.	COMPOSITION	STATION LOCATION
647A	1	11/8	0920	1	Silty Sand	B-2
	2		0930	2	" "	" "
	3		0940	3	Clay	" "
	1		1050	4	Silty Sand	B-4
	2		1100	5	" "	" "
	3		1110	6	" "	" "
	1		1310	7	" "	B-3
	2		1320	8	" "	" "
	3		1330	9	Blue Clay	" "
	1		1440	10	Silty Sand	B-1
	2		1450	11	" "	" "
	3		1500	12	" "	" "

RELINQUISHED BY (SIGNATURE) Kris Bancroft	DATE/T 11/12 1255
RECEIVED BY (SIGNATURE)	DATE/T
RELINQUISHED BY (SIGNATURE)	DATE/T
RECEIVED BY (SIGNATURE)	DATE/T
RELINQUISHED BY (SIGNATURE)	DATE/T
RECEIVED BY (SIGNATURE)	DATE/T

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.
CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

615/265-4533

ACCOUNT NO.	2813-001 **DATE** NOVEMBER 16, 1990
RECEIVED FROM	GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343 MR. KRIS BANCROFT
RECEIVED DATE	11/12/90
MATERIAL	SOIL
MARKED	UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 643-C, COMPOSITE SAMPLES NO. 1 & 2 EAST, 11/08/90, 0810
LABORATORY NO.	307,042

Total Petroleum Hydrocarbons ppm 30

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

MARTIN H. DAVIS
President

ibc

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.
CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 643-C, COMPOSITE SAMPLES NO. 1 & 2 WEST, 11/08/90, 0820

LABORATORY NO. 307,044

Total Petroleum Hydrocarbons ppm	30

The hydrocarbons were determined by EPA method 418.1.

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CHATTANOOGA, TENNESSEE 37405

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President

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ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 1, B-1, 11/08/90, 1440

LABORATORY NO. 307,080

Total Petroleum Hydrocarbons ppm	10

The hydrocarbons were determined by EPA method 418.1.

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President

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ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 2, B-1, 11/08/90, 1450

LABORATORY NO. 307,081

Total Petroleum Hydrocarbons ppm	10

The hydrocarbons were determined by EPA method 418.1.

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President

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ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 3, B-1, 11/08/90, 1500

LABORATORY NO. 307,082

Total Petroleum Hydrocarbons ppm	10

The hydrocarbons were determined by EPA method 418.1.

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CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

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ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 1, B-2, 11/08/90, 0920

LABORATORY NO. 307,071

Total Petroleum Hydrocarbons ppm	60

The hydrocarbons were determined by EPA method 418.1.

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MARTIN H. DAVIS
President

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ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 3, B-2, 11/08/90, 0940

LABORATORY NO. 307,073

Total Petroleum Hydrocarbons ppm	20

The hydrocarbons were determined by EPA method 418.1.

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CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 1, B-3, 11/08/90, 1310

LABORATORY NO. 307,077

Total Petroleum Hydrocarbons ppm	860

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

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515 CHEROKEE BLVD.
CHATTANOOGA, TENNESSEE 37405

MARTIN H. DAVIS
President

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 2, B-3, 11/08/90, 1320

LABORATORY NO. 307,078

Total Petroleum Hydrocarbons ppm	740

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

MARTIN H. DAVIS
President

ibc

TECHNICAL LABORATORIES, INC.

515 CHEROKEE BLVD.

MARTIN H. DAVIS
President

CHATTANOOGA, TENNESSEE 37405

615/265-4533

ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 3, B-3, 11/08/90, 1330

LABORATORY NO. 307,079

Total Petroleum Hydrocarbons ppm	60

The hydrocarbons were determined by EPA method 418.1.

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615/265-4533

ACCOUNT NO.	2813-001 **DATE** NOVEMBER 16, 1990
RECEIVED FROM	GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343 MR. KRIS BANCROFT
RECEIVED DATE	11/12/90
MATERIAL	SOIL
MARKED	UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 1, B-4, 11/08/90, 1050
LABORATORY NO.	307,074

Total Petroleum Hydrocarbons ppm 30

The hydrocarbons were determined by EPA method 418.1.

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ACCOUNT NO. 2813-001 **DATE** NOVEMBER 16, 1990

RECEIVED FROM GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343
MR. KRIS BANCROFT

RECEIVED DATE 11/12/90

MATERIAL SOIL

MARKED UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 2, B-4, 11/08/90, 1100

LABORATORY NO. 307,075

Total Petroleum Hydrocarbons ppm	30

The hydrocarbons were determined by EPA method 418.1.

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ACCOUNT NO.	2813-001 **DATE** NOVEMBER 16, 1990
RECEIVED FROM	GEO SERVICES, P. O. BOX 444, HIXSON, TENNESSEE 37343 MR. KRIS BANCROFT
RECEIVED DATE	11/12/90
MATERIAL	SOIL
MARKED	UNITED STATES NAVY, PROJECT NO. USN900820SCCFMW, STA. NO. 647 A, SAMPLE NO. 3, B-4, 11/08/90, 1110
LABORATORY NO.	307,076

Total Petroleum Hydrocarbons ppm 10

The hydrocarbons were determined by EPA method 418.1.

TECHNICAL LABORATORIES, INC.

Martin H. Davis

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President

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USN980816SCC(FMW)

AUTHORIZATION OF REPORT

This is a confidential report, solely for the use of the United States Navy (herein referred to as the "Client.") This report should not be released or disclosed to any other party without the prior written consent of GEO Services.

The synopsis of the services performed for the Client at their Fleet And Mine Warfare Training Center, in Charleston, South Carolina, facility (herein referred to as the "Site"), is enclosed in the body of this report. The survey, and all related work performed by GEO Services does not represent, warrant, certify, or imply that (i) all the hazardous or toxic materials on the Site, above or below ground, at the time the survey was performed are qualified or quantified herein; (ii) that any local, state, or federal regulations appertaining to the environment have not been violated in such a manner as to incumber the Client with legal penalties, civil suit, or criminal liabilities; (iii) that environmental management at the Site will not be the subject of future investigations by local, state, or federal environmental authorities.

This report describes conditions observed at the Site on 7 & 8 November 1990. GEO Services did not perform systematic monitoring. The decision not to perform systematic monitoring does not constitute a representation, warranty, or opinion that situations technically significant (or significant under environmental regulations), should not be undertaken. Observations reported relate solely to the information available on the day(s) the Site was observed and to information made available by the regulatory authorities. GEO Services does not give any opinion or information pertaining to the condition of the Site prior to or subsequent to the date of this report. This is a limited and qualified opinion of GEO Services, and the statements or descriptions given in this report are for informational purposes only, and are not made or given as warranty. No representations pertaining to the Site are made except those contained in this report. This report shall not constitute an agreement to indemnify or insure against any liability or expense whatsoever.

Kris Bancroft

Kris Bancroft, RPG PE CHMM
GEO Services
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Hixson, Tennessee 37343

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