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CNC CHARLESTON
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WORK PLAN FOR THE CLEANING OF FIVE 50,000 BARREL CONCRETE TANKS WITH
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL REVIEW
LETTER CHICORA TANK FARM CNC CHARLESTON SC
03/12/2003
NAVFAC SOUTHERN

D H E C



PROMOTE PROTECT PROSPER

2600 Bull Street
Columbia, SC 29201-1708

12 March 2003

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Larry R. Chewning, Jr., DMD

Commander
NAVFACENGCOM Southern Division
Attn: Code ES24 (Gabriel Magwood)
P.O. Box 190010
North Charleston, SC 29419-9010

Re: CNB – Chicora Tank Farm
Site Identification # 13350
Soil Remediation and Free Product Recovery Report received 3 March 2003
Charleston County

Dear Mr. Magwood:

The Department has completed technical review of the referenced document. Interpretation of the analytical data provided in the referenced report indicates that chemicals of concern remain above established Risk-Based Screening Levels and MCLs.

Sampling data included in the report indicates that excavation activities were unsuccessful in removing all of the soil contamination at this site. The Department concurs with the conclusion as presented in the report that additional soil characterization activities are necessary at this facility.

The proposal to conduct additional soil sampling activities is approved for immediate implementation. Please note that all environmental soil sampling borings shall be installed, maintained, and abandoned in accordance with South Carolina Well Standards R.61-71 (I.3 a-f).

Please submit a report detailing the results of the soil sampling efforts along with a proposal for additional remedial actions no later than 31 July 2003. Should you have any questions please contact me at (803) 898-3553 (office phone), (803) 898-2893 (fax) or by e-mail bishopma@dhec.sc.gov.

Sincerely,

Michael A. Bishop, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC
Jerry Stamps, BLWM
Ray Hoekstra, PE – STEP, 1006 Floyd Culler Court, Oak Ridge TN 37830
Technical File



17 June 2002

2600 Bull Street
Columbia, SC 29201-1708

Commander
NAVFACENGCOM Southern Division
Attn: Code ES24 (Gabriel Magwood)
P.O. Box 190010
North Charleston, SC 29419-9010

COMMISSIONER:
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Secretary

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L. Michael Blackmon

Larry R. Chewning, Jr., DMD

RE: CNB – Chicora Tank Farm
Site Identification # 13350
Corrective Action Plan received 13 May 2002
Charleston County

Dear Mr. Magwood:

The Department has completed technical review of the referenced document. As submitted, the Corrective Action Plan (CAP) provides an outline of active corrective action activities designed to remediate hydrocarbon contamination at the referenced facility. Proposed methodology includes the excavation of contaminated soils, followed by semi-annual monitoring of groundwater to verify remediation goals.

Specific comments regarding the submitted CAP are as follows:

Section 3.1 EXCAVATION AND OFF-SITE DISPOSAL OF SOIL - Transportation of excavated soils must be in accordance with local, state and federal regulations. Soils must be disposed of at a permitted treatment facility and the Department shall be provided with the manifest and receipts for transported soils as part of an Excavation Completion Report. Please notify the Trident District EQC Office (803-740-1590) at least 48 hours in advance as to the exact date and time of excavation activities.

Section 3.1.1 EXCAVATION – Any soils stockpiled onsite must be properly protected from the environment (i.e. covered with plastic and placed on an impermeable surface) and removed within 48 hours of excavation.

Section 3.1.2 OFF-SITE DISPOSAL – The Navy must properly characterize soils removed from the site and obtain authorization from the selected disposal facility that it is approved to accept petroleum contaminated soils for disposal.

Section 3.2 DEWATERING DURING SOIL EXCAVATION – Any free product and/or water removed from the excavation must be properly transported to an authorized treatment facility. The Navy shall provide the manifests and receipts for the proper disposal of free product and/or water as part of the Excavation Completion Report.

Section 4.1 SITE PREPERATION (PRE-EXCAVATION ACTIVITIES) – Monitoring well abandonment performed as part of site preparation activities shall be in accordance with South Carolina Well Standards R.61-71 dated 26 April 2002.



TETRA TECH NUS, INC.

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JUN 17 2002

**Water Monitoring, Assessment &
Protection Division**

TtNUS/TAL-02-043/4015-3.2

June 14, 2002

Project Number 4015

Mr. Michael Bishop
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0174

Subject: Active Corrective Action Plan Dated 5/10/02
Chicora Tank Farm
SCDHEC Site Identification #13350
Charleston Naval Complex
North Charleston, South Carolina

Dear Mr. Bishop:

It has come to our attention that an error was made in calculating the soil volumes provided in the Active Corrective Action Plan for the Chicora Tank Farm (dated May 10, 2002). Specifically, the estimated volume of soil to be excavated and backfilled were incorrect. The correct volumes are provided on the attached errata pages. These pages replace pages 4-1, 4-3, and 4-4 in Section 4 of the referenced document. A revised compact disk (CD) is being prepared and will be forwarded upon completion.

If you have any questions regarding this submittal, please contact me by phone at (813) 806-0202, or via e-mail at calliganp@ttnus.com.

Sincerely,

Paul E. Calligan, P.G.
Task Order Manager

Enclosures

c: Mr. Gabriel Magwood, SOUTHDIV

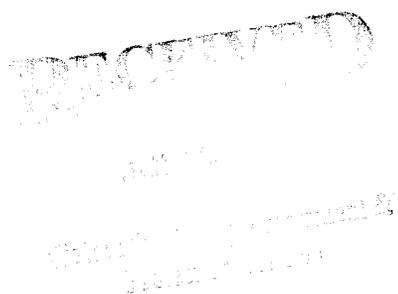


DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. BOX 190010
2155 EAGLE DRIVE
NORTH CHARLESTON, S.C. 29419-9010

Li 1.14.98
13350
602.4.98

Rick Richter
Trident 5090
Code 1849
29 Dec 1997

Mr. Paul Bristol
South Carolina Department of Health
And Environmental Control
Ground-Water Protection Division
2600 Bull Street
Columbia, SC 29201



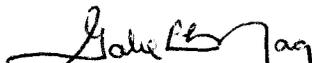
WORK PLAN FOR THE CLEANING OF CHICORA TANK FARM

Dear Mr. Bristol:

Attached is the work plan for the cleaning of the Chicora Tank Farm, Charleston Naval Base, Charleston, SC. The cleaning will be performed by the Civil Engineering Technical Services Center of the Air National Guard. This branch of the Air National Guard has nine years experience cleaning tanks. The actual cleaning of the tanks is scheduled to start on January 6, 1998. Due to time restrictions and the Holiday Season, work preparation for the cleaning started on December 15, 1997.

If you have any questions please contact me at (803) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Petroleum/UST Branch

Email to Trident District
1.14.98

**DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA**

**WORK PLAN
FOR THE CLEANING OF
FIVE (5) 50,000-BARREL CONCRETE TANKS**

At the

**CHICORA TANK FARM
NAVAL BASE CHARLESTON
CHARLESTON, SOUTH CAROLINA**

PREPARED BY:

**GABRIEL L. MAGWOOD
Engineer In Charge**

24 DECEMBER 1997

**WORK PLAN
FOR THE CLEANING OF
FIVE (5) 50,000-BARREL CONCRETE TANKS**

At the

**CHICORA TANK FARM
NAVAL BASE CHARLESTON**

CHARLESTON, SOUTH CAROLINA

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SECTION 1: PROJECT OVERVIEW

1.1 Objective

The objective of this project is to accomplish the cleaning of 5 50,000-barrel concrete cut-and-cover tanks and their associated pump rooms at the Chicora Tank Farm.

1.2 Facility Description

The Chicora Tank Farm is located in North Charleston, South Carolina, approximately 1/2 mile west of the former Charleston Naval Base. The facility occupies an area of 23.64 acres and is bounded by Carner Avenue on the west, Chicora Avenue on the east, a marshland to the north, and Clement Ferry Road to the south. The Norman C. Toole Military Magnet Middle School abuts the property on the northwest. The Fuel Farm appears to be rolling pasture land and consists of five 50,000-barrel concrete cut-and cover tanks (Tanks 3906-K, L, M, N and P) and one 27,000-barrel concrete cut-and cover tank (Tank 3906-O). The tanks are approximately four feet below grade. Tank diameters are approximately 138'-6" for the 50,000-barrel tank and 102'-6" diameter for the 27,000-barrel tank. The clear height inside the tanks is approximately 20 feet. Pump pits are connected adjacent to the tanks with approximate inside dimensions of 24 feet wide by 24 feet long by 25 feet high.

1.3 Responsible Parties

1.3.1 This work will be accomplished by the Civil Engineering Technical Services Center of the Air National Guard, Minot, North Dakota with support from the Charleston Detachment.

1.3.2 Southern Division will perform the oversight and tank screening for the cleaning of the tanks.

SECTION 2: APPLICABLE DOCUMENTS

2.1 The following document will be used in performing this work. The latest editions of documents shall be used when applicable.

2.1.1 SCDHEC Underground Storage Tank Control Regulations, R.61-92

2.1.2 SCDHEC UST Assessment Guidelines for Permanent Closure, Change-In-Owner and Change-In-Service, June 1995

2.1.3 National Fire Protection Association Flammable and Combustible Liquids Codes, NFPA 30, Appendix B, Abandonment or Removal of Underground Tanks

2.1.4 American Petroleum Institute (API) Recommended Practice 1604, Second Edition, December 1987, Removal and Disposal of Used Underground Petroleum Storage Tanks

2.1.5 American Petroleum Institute (API) Recommended Practice 2015, 1991 Safe Entry and Cleaning of Petroleum Storage Tanks

2.1.6 Safety and Health Requirements Manual, US Army Corps of Engineers EM 385-1-1, latest edition.

2.1.7 Naval Facilities Engineering Command Guide Specification, SOUTHDIV, Section 01450, Quality Control

2.1.8 Code of Federal Regulations (CFR) 40 CFR 280, Owners and Operators of Underground Storage Tanks

2.1.9 Code of Federal Regulations (CFR) 29 CFR 1910, Occupational Safety and Health Standards

2.1.10 Code of Regulations (CFR) 29 CFR 1926.21 Safety Training and Education

2.1.11 OPNAVINST 5100.23D Navy Occupational Safety and Health Program Manual

2.1.12 Comprehensive Safety and Health Plan, Charleston Naval Base Complex

2.1.13 Quality Control Plan for UST Removal, Charleston Naval Base Complex

SECTION 3: SCOPE OF WORK

3.1 General Project Overview

3.1.1 The work included in the cleaning of the five 50,000-barrel concrete cut-and-cover tank consists of isolating the tanks from the pipelines, accessing tank manways, purging the tanks, confined space entry, removing product, cleaning tank walls, ceiling and floors and disposing of waste water used in cleaning.

3.1.2 The cleaning will be visually inspected by Southern Division to ensure the tank is free of loose rust, dirt, scale, loose materials, fuel oil, grease, sludge and other deleterious materials.

3.2 Tank Isolation

The tanks shall be isolated from the pipelines by shutting and verifying closure of all supply, return and drain lines for each tank.

3.3 Work Preparation

3.3.1 There are three manways associated with each tank. One manway has a removable hatch above the entrance and is readily available. The other two manways are on top of the tank approximately 6 feet below land surface.

3.3.2 The two manways below land surface shall be uncovered using a backhoe and the manway covers removed. The soil around the manway will be sloped, therefore shoring will not be needed. These manways shall be used to ventilate the tanks during the cleaning operation.

3.3.3 An Organic Vapor Analyzer (OVA), visual inspection and smell shall monitor the soil removed to expose the manways. If contaminated, soil will be disposed of in accordance with the Soil Corrective Action Plan for the Charleston Naval Complex.

3.3.4 Underground utilities will be located prior to any excavation.

3.3.5 Electrical service shall be disconnected from the transformer buildings to the tanks.

3.4 Product Removal

3.4.1 Vacuum trucks will be used to remove products from the tanks. Trucks will be bonded to the tank or grounded to prevent electrostatic ignition hazards. The vacuum truck will be located upwind from the tank and outside the path of probable vapor travel. The vacuum truck exhaust gases will be discharged downwind of the truck and drum area.

3.4.2 The product in Tanks K, L, M, N and P have been previously sampled and are not hazardous. The product will be transported to Tank "O", a 27,000-barrel used oil tank on site, which will be cleaned in conjunction with the pigging and cleaning of the transfer and drain lines. The pigging and cleaning of the transfer and drain lines along with the cleaning of Tank "O" will be accomplished later as a separate action.

3.4.3 Sludge removed from the tanks, that is unable to be mixed with product and transported to Tank "O", will be contained in 55-gallon drums, sampled and disposed of in accordance with regulation.

3.4.4 Cleaning rags and personal protective equipment (PPE) used during the cleaning operation will be placed in 55-gallon drums and disposed of as solid waste.

3.5 Tank Purging

3.5.1 An explosion proof blower and explosion proof air eductor will be used to ventilate the tank during cleaning. The equipment will be set up to circulate the air to all parts of the tank.

3.5.2 The tank will be monitored and ventilated constantly to insure the LEL levels are below 10%.

3.6 Confined Space Entry

3.6.1 Confined space entry will be performed as required by the Safety and Health Requirements Manual, US Army Corps of Engineers EM 385-1-1, latest edition, API Publication 2015, Cleaning Petroleum Storage Tank, and OPNAVINST 5100.23D Navy Occupational Safety and Health Program Manual.

3.6.2 Confined space entry will be made through the manway with the removable hatch on top of each tank. The two additional manways on each tank will be used for ventilation.

3.6.3 All site personnel entering confined spaces will complete a Confined Space Entry Permit for each space to be entered. This form will be submitted to the CIH prior to work in the confined space.

3.6.4 The tank will be constantly monitored during the confined space entry to insure the atmosphere stays at a safe level.

3.7 Tank Cleaning

3.7.1 Pressure washers using fresh water will be used to clean the tanks. Each tank will be triple washed. Steam cleaners will be utilized if the use of hot water is needed to remove some product. Detergents will only be used if the washers and steam cleaner will not remove all hydrocarbons from the concrete surfaces.

3.7.2 A squeegee will be used to remove the sludge from the floor. Sludge removed from the tanks, that is unable to be mixed with product and transported to Tank "O", will be contained in 55-gallon drums, sampled and disposed of in accordance with regulation.

3.7.3 Confined Space Entry procedures will be followed when cleaning the tank.

3.7.4 A vacuum truck will be used to remove the rinsate after cleaning. The rinsate will be transported to Tank "O" on site.

3.8 Tank Screening

3.8.1 After cleaning the tank, the concrete will be visually inspected to insure that it is free of loose materials, fuel oil, grease, sludge, and other deleterious material.

3.8.2 The concrete will be screened for the presence of volatile and semi-volatile hydrocarbon contamination using an OVA.

3.8.2.1 Organic Vapor Analyzer readings will be taken at three different levels within the tank and pump room at various locations. The reading will be taken at the bottom, approximately 10 feet above the floor, and near the top of the tank.

3.8.2.2 Tank cleaning procedure will be repeated until the criteria of paragraph 3.8.1 are achieved.

SECTION 4: ADDRESSES

4.1 Commanding Officer

ATTN: Code 1849

Southern Division Naval Facilities Engineering Command

2155 Eagle Drive, PO Box 190010

North Charleston, SC 29419-9010

POC: Gabriel L. Magwood

(803) 820-7307

4.2 Commanding Officer

ATTN: Code 0733WJC

Southern Division Naval Facilities Engineering Command

2155 Eagle Drive, PO Box 190010

North Charleston, SC 29419-9010

POC: Wayne Cotton

(803) 820-7375

#13350

LP 10.17.96
Lo 10.17.96

ENTERPRISE
ENGINEERING, INC.

MEETING MINUTES

August 12, 1996

MEETING DATE: August 8, 1996

PROJECT: Chicora Tank Farm Demolition

PROJECT NO: 95-1878

LOCATION: SCDHEC Offices, Columbia, SC

ATTENDANCE:

Ricky Young	EEI
Alan Wironen	EEI
Paul M Bergstrand	SCDHEC
Paul L Bristol	SCDHEC
James R. Hess	SCDHEC
Johnny Tapia P.	SCDHEC
Ann Ragan	SCDHEC
Jeri Johnson	Chas Naval Complex Redevelopment Authority
John J. Schnabel	SCDHEC
Harold Seabrook	SCDHEC
Art Braswell	SCDHEC-SW
Daryle Fontenot	SOUTHDIV
Tony Hunt	SOUTHDIV
Gabriel L. Magwood	SOUTHDIV
Wayne Cotton	SOUTHDIV

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AUG 22 1996

Groundwater Protection
Division

PURPOSE OF MEETING: To discuss demolition options and establish a Unified position.

1. Meeting started with Ms. Ragan providing opening remarks and stating the objective of the meeting was to explore the demolition in place option and develop a unified position satisfactory to all parties involved.

Introductory remarks were followed by introduction of the attendees.

2. Ms. Ragan then summarized the alternatives as follows:

1. Fill in place
2. Demo in place
3. Demo with rubble removal

Option 1 is unacceptable to the Redevelopment Authority.

Option 4 is cost-prohibitive to the Navy.

Meeting Minutes
August 12, 1996

3. Enterprise Engineering provided a summary of their project scope, options considered and the costs associated with each option. The EEI options include:

Option 1: Clean and inert tanks and piping, abandon tanks in place with sand fill.

* Option 2: Clean and inert tanks and piping, demolish tank roofs, fill remainder of tank with sand.
positek - no sampling by DHEC reqd -

Option 3: Clean and inert tanks and piping, demolish tank roofs and upper portion of walls and columns, dispose of concrete debris on-site, fill tanks with excavated soil.

Option 4: Clean and inert tanks and piping, completely remove on-site tanks, piping and structures, dispose of debris off-site.

Each option also includes the draining and grouting of the fuel pipelines between the Chicora Fuel Farm and the base.

Option 4 is cost prohibitive to the Navy, yet is the desired alternative for the Redevelopment Authority. Option 2 is undesirable due to cost (Navy) and since it does not restore the site to a useable condition (Redevelopment Authority). DHEC also expressed some concerns for these and the other options. Their concerns were discussed at some length later in the meeting.

The remainder of the meeting concentrated on the discussion of EEI's options 1 and 3.

4. Significant discussion items include:

- Tank demolition will include prior steam or detergent cleaning of the concrete to remove surface contamination.
- Sand is an acceptable material to use in the tanks as an inert fill
- Partial demolition of the tank may include the disposal of steam cleaned construction debris within the tank, provided the Government requests a waiver of present regulations.
- DFSC will not provide additional funds for the demolition of structures outside their area of responsibility (i.e. Boiler plant, transformer buildings, drainage structures, etc.).
- DHEC prefers that an "impervious" cap be placed over the tank if the partial demolition option is pursued.
- The Redevelopment Authority wants a site that is as flat as possible for use as ball fields.
- Abandonment of utilities and tank debris on-site will be designed to provide sufficient soil coverage. Two feet of cover was suggested.
- EEI believes some monetary savings can be realized through re-evaluating the project scope and materials.

Meeting Minutes
August 12, 1996

- DHEC will require site monitoring if a partial demolition with disposal on-site is pursued.
- Borings along the pipeline header within the fuel farms will be necessary to confirm no leakage, particularly at the valves.
- Low contamination levels within the concrete, impermeable debris cap and inward hydraulic gradient will result in little or no appreciable contamination from the concrete.

5. Those in attendance set the following goals:

- Southern Division will contract with EEI to review the project estimates and scopes for both Alternatives 1 and 3.
- A follow-up meeting was tentatively scheduled for September 30, 1996 to discuss the results of the estimate re-evaluation, and development from the meeting with the local residents.

We believe that the minutes of this meeting accurately reflect the statements made, and that they represent the entire extent of all discussions. Those in attendance are encouraged to submit corrections for revisions to these minutes if found necessary. If no requests are made within 15 days of the date of issue of these minutes, they will be considered accepted as written.

Submitted by:

ENTERPRISE ENGINEERING, INC.



Alan M. Wironen, P.E.
Project Manager

AMW/smk/FU15

DISTRIBUTION: All Attendees

**South Carolina Department of Health and Environmental Control
Bureau of Solid and Hazardous Waste Management**

MEETING REGISTER

Chicora Tank Farm

August 8
~~June 27~~, 1996

	<u>Attendants (please print)</u>	<u>Affiliation</u>	<u>Phone Number</u>
1.	<u>Ricky YOUNG</u>	<u>ENTERPRISE ENGINEERING</u>	<u>(207) 846-3900</u>
2.	<u>Al Wierman</u>	<u>" "</u>	<u>" "</u>
3.	<u>PAUL M. BERGSTRAND</u>	<u>BSHWM</u>	<u>896-4016</u>
4.	<u>Paul C. Bristol</u>	<u>BDWP-ARD</u>	<u>734-5328</u>
5.	<u>James R. HESS</u>	<u>BDWP-ARD</u>	<u>734-5329</u>
6.	<u>Johnny Tapia P.</u>	<u>BSHWM-Permitting</u>	<u>(803) 896-4179</u>
7.	<u>ANN Ragan</u>	<u>DHEC</u>	<u>803-734-4721</u>
8.	<u>JERI JOHNSON</u>	<u>Chas Noel Complx Reduc. Auth</u>	<u>747-0010</u>
9.	<u>John J. Schmitt</u>	<u>DHEC</u>	<u>803-896-4216</u>
10.	<u>Paul Schmitt</u>	<u>SC DHEC</u>	<u>803-896-4120</u>
11.	<u>ART BRATWELL</u>	<u>SC DHEC - SW</u>	<u>803-896-4202</u>
12.	<u>Daryle Fortenot</u>	<u>SOU-ERN DIVISION</u>	<u>743-9985 x15 803 820-5607</u>
13.	<u>TONY HUNT</u>	<u>SOUTHERN DIVISION</u>	<u>803-820-5525</u>
14.	<u>GABRIEL L. MAGWOOD</u>	<u>SOUTHERN DIVISION</u>	<u>803-820-7307</u>
15.	<u>Wayne Cotton</u>	<u>Southern Division</u>	<u>803-820-7325</u>

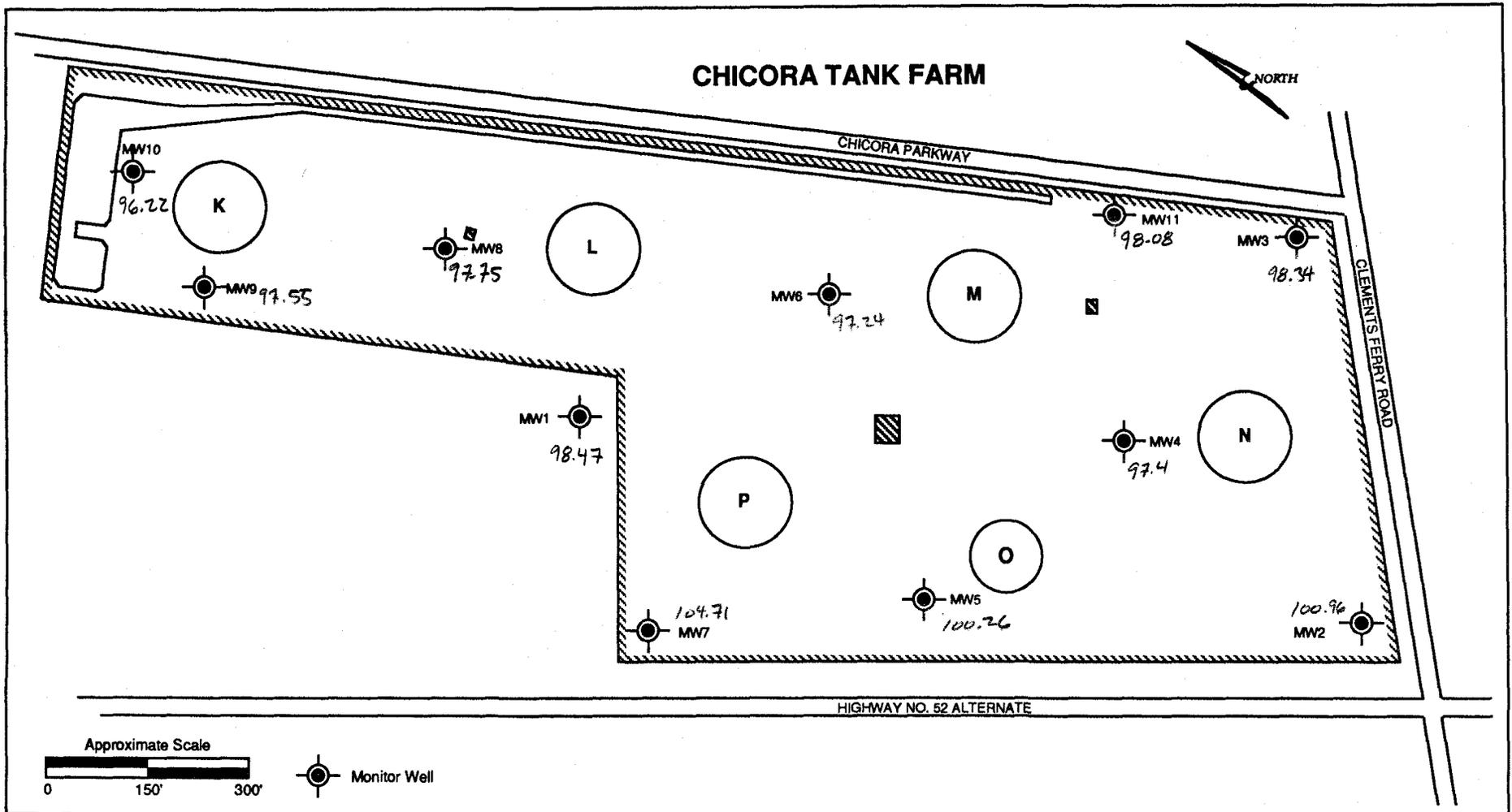
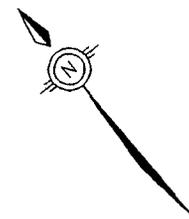
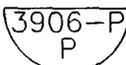


Figure 2-1. Soil boring/monitoring well location map.



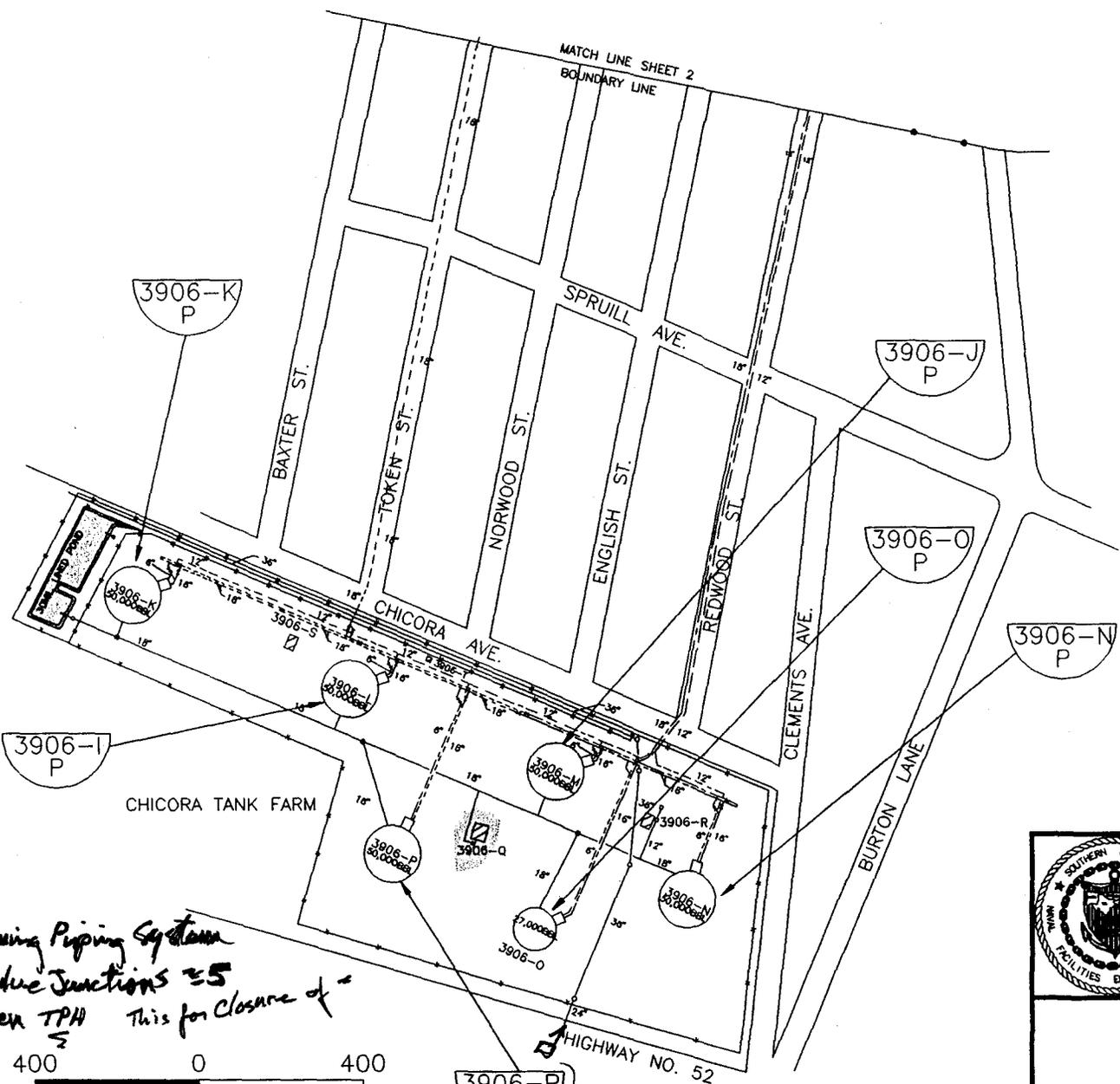
LEGEND

-  3906-P UNDERGROUND TANK
- P PETROLEUM
- C CHEMICAL
- M MISCELLANEOUS
-  OIL/WATER SEPARATOR
-  FUEL OIL
-  SLUDGE LINES
-  DRAIN LINES
-  DIESEL LINES
-  CATCH BASIN
-  VALVE
-  MANHOLE

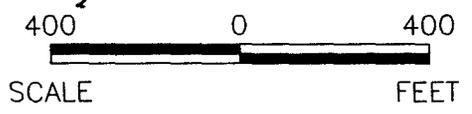


ENVIRONMENTAL BASELINE SURVEY
NAVAL BASE CHARLESTON

FIGURE 5-5A
CHICORA TANK FARM
RESOURCE MAP
USTs, ASTs



?
*Cleaning Piping System
@ Valve Junctions \approx 5
Screen TPH This for Closure of =*



3906-P
*Truck stop
Catch Basin 3*



11 May 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
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Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

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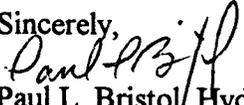
Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

Re: Completion Report-Demolition Tank "P" dated 4 April 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides a narrative describing demolition activities employed to deconstruct Fuel Storage Tank "P" at Chicora Tank Farm. Based on the information presented, it appears the employed activities were conducted in accordance with the approved Work Plan dated 6 July 1998. In this regard, the author has no further comments concerning Tank "P" at this time.

Should you have any questions please contact me at (803) 898-3559.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



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

Li 5.4.99
Lo 5.11.99

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5090
Code 1849
4 Apr 99

APR 16 1999

Water Monitoring, Assessment &
Protection Division

Mr. Paul Bristol
South Carolina Department of Health
And Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, SC 29201

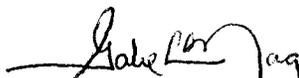
**COMPLETION REPORT FOR THE DEMOLITION OF CHICORA TANK
FARM TANK "P"**

Dear Mr. Bristol:

Enclosed are two (2) copies of the Completion Report for the Demolition of Tank "P" at the Chicora Tank Farm, Charleston Naval Base, Charleston, SC.

If you have any questions please contact me at (843) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Remedial Project Manager

Encl:

Completion Report for the Demolition of Tank "P" (2 copies)

original work plan 6 Jul 98



Memorandum

To: Art Braswell, Manager
Regulatory Development and Planning Section
Solid Waste Planning Recycling Division
Bureau of Land and Waste Management

From: Paul L. Bristol *Paul Bristol*
Groundwater Quality Section
Water Monitoring, Assessment and Protection Division
Bureau of Water

Re: Waiver Request/Charleston Naval Complex
Chicora Tank Farm

Date: 7 April 1999

Please find enclosed a copy of the document *Work Plan to Excavate Tanks/Pump Rooms K,L,M,N & O and Closure by Partial Demolition at Chicora Tank Farm in North Charleston, SC*. Consistent with previous demolition at the subject site, the Department of the Navy is requesting the SC Department of Health and Environmental Control to agree to an exemption waiver with regard to demolition debris at the referenced site. Appendix F of the enclosed document contains the Waiver Form. Upon return receipt of the executed document, the author will provide concurrence to the Charleston Naval Complex to implement the proposed demolition and attach the executed Waiver Form to the letter of transmittal.

Should you have any questions please contact me at 898-3559, or e-mail address bristolpl.



30 March 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
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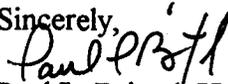
Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

Re: Monitoring Well Abandonment Proposal dated 23 March 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. The submitted proposal indicates that monitoring wells MW-4, MW-5, MW-6, MW-7, MW-8, MW-9 are in areas of excavation surrounding Tank K and Tank L, currently awaiting demolition. Based on the information provided, the proposal to abandon the identified monitoring wells is approved for implementation.

A written report detailing site activities should be submitted to my attention subsequent to completion of abandonment. Should you have any questions please contact me at (803) 898-3559.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



DEPARTMENT OF THE NAVY

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

Li 3.30.99
Lo 3.30.99

5090
Code 1849
23 Mar 99

#13356

South Carolina Department of Health
And Environmental Control
Attn: Mr. Paul Bristol
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia SC 29201

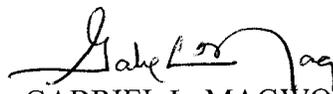
REQUEST FOR WELL ABANDONMENT AT CHICORA TANK FARM

Dear Mr. Bristol:

The Navy is in the process of planning the demolition of two additional cut-and-cover tanks at the Chicora Tank Farm (Tanks K and L). Monitoring wells MW-4, MW-5, MW-6, MW-7, MW-8 and MW-9 will require abandonment to facilitate demolition. We are requesting that we be allowed to abandon these wells in accordance with South Carolina Well Standards and Regulations R.61-71.

If you have any questions please contact me at (843) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Remedial Project Manager

Encl:
(1) Request for well abandonment.

RECEIVED

MAR 29 1999

Water Monitoring, Assessment &
Protection Division



DEPARTMENT OF THE NAVY
SUPERVISOR OF SHIPBUILDING, CONVERSION AND REPAIR, USN
PORTSMOUTH, VIRGINIA, ENVIRONMENTAL DETACHMENT CHARLESTON
1899 NORTH HOBSON AVENUE, BUILDING 30
NORTH CHARLESTON, SOUTH CAROLINA 29405-2106

IN REPLY REFER TO:

Ser 230

MAR 18 1999

MEMORANDUM

From: Director, Supervisor of Shipbuilding, Conversion and Repair, USN Portsmouth Va., Environmental Detachment, Charleston, SC (SPORTENVDETCASN)

To: Southern Division Naval Facilities Engineering Command
(Code 1849 Gabe Magwood)

Subj: ABANDONMENT OF MONITORING WELLS AT CHICORA TANK FARM

Ref: (a) Southern Division Naval Facilities Engineering Command Project Number 99027, Tank Closure at Chicora Tank Farm
(b) South Carolina Well Standards and Regulations R. 61-71

1. The Environmental Detachment is working on tank closure at Chicora Tank Farm in accordance with the reference (a) project. The following monitoring wells (MW)- 4,5,6,7,8,and 9 will require abandonment to facilitate excavation of underground tanks at the Chicora Tank Farm. These monitoring wells are in the areas of excavation surrounding tanks during the demolition phases.

2. These wells will be abandoned in place by Environmental Detachment Charleston (DET). Well abandonment will be accomplished by removing the 2 inch PVC well casings and filling the boreholes with cement grout in accordance with the requirements of reference (b) and under the supervision of John T. Hardin of the DET. Mr. Hardin is a well-driller licensed by the state of South Carolina. The average depth of the wells is 16.5 feet.

3. Questions and/or comments regarding abandonment of this well should be addressed to Copes Wannamaker at (803) 743-6777 extension 212.

A handwritten signature in black ink, appearing to read "E. R. Dearhart", is positioned above the printed name.

E. R. Dearhart



20 August 1998

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
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Brian K. Smith

Rodney L. Grandy

Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attn: Mr. Gabriel Magwood

Re: Work Plan-Cleaning Tanks "K, L, M, N, O" dated 28 July 1998
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the plan provides procedures for cleaning and inerting the remaining bulk storage tanks and pigging/grouting of transfer lines at the subject site. Based on the information, the proposed activities are approved for implementation.

Appropriate and timely notice should be provided to the Trident District EQC office (843-740-1590) prior to initiating field work at the facility. Please submit a copy of the final report, including appropriate disposal manifests, to my attention upon completion of the above activities.

Should you have any questions please contact me at (803) 734-5328.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



30 July 1998

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
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Rodney L. Grandy

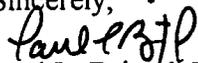
Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attn: Mr. Gabriel Magwood

Re: Work Plan-Demolition Tank "P" dated 6 July 1998
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As discussed during our telephone conversation on 27 July 1998 the proposed demolition activities are approved for implementation. Please find enclosed the signed waiver form as requested.

Should you have any questions please contact me at (803) 734-5328.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC

DEMOLITION ON SITE WAVIER FORM
(Copy to RPM, Gabriel L. Magwood)

Regulation 61-107.11 Construction, Demolition, and Land-Clearing Debris Landfills states that wastes having been in contact with petroleum products and painted with lead-based paint to be disposed of in a lined monitored landfill such as a licensed municipal solid waste landfill or a industrial solid waste landfill. Some of the concrete has not been in direct contact with the petroleum products. The exemption to this, (SC R.61-107.11(A)(5)) states clean hardened concrete not in direct contact with petroleum products and not painted with lead-based paint when used as structural fill in the construction of a foundation for a building project in progress is "clean" and eligible for burial on site under this exemption.

SCDHEC and SOUTHDIV have negotiated a specific disposal plan for the concrete waste which is affordable and protective of the environment (See Appendix G Meeting Minutes dated 12 August 1996 from Enterprise Engineering, Inc., Project Number 95-1878).

Regulators agree that the concrete construction debris (which has been cleaned free of any petroleum products by pressure washing) from tank "P" and pump room demolition will be disposed of within the tank and pump room bottom only. Since the concrete waste will be contained in the lower section of the tank "P" and pump room, this wavier authorizês the one time exemption to the solid waste regulation for the disposal of concrete debris at Chicora Tank Farm. However, during the partial demolition sound engineering and good work practices will be used ensuring the protection of the environment.

SCDHEC

Arthur D. Brantley
(Concur)

Date 7/27/98



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

6.7.9.98

5090
Code 1849
6 July 1998

Mr. Paul Bristol
South Carolina Department of Health
And Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, SC 29201

WORK PLAN FOR THE DEMOLITION OF CHICORA TANK FARM TANK "P"

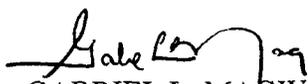
Dear Mr. Bristol:

Enclosed are two (2) copies of the work plan for the demolition of Tank "P" at the Chicora Tank Farm, Charleston Naval Base, Charleston, SC. Included in the work plan, Appendix F, is the Demolition On-Site Waiver Form requesting a "One-Time Exception to the Solid Wastes Regulations" as discussed between Southern Division and SCDHEC. After reviewing the work plan, it is requested that this form be signed and returned to Southern Division, Gabriel L. Magwood, to be placed in the Chicora Tank Farm "official folder."

All efforts are being made to perform the demolition of Tank "P" during Charleston County Schools' summer vacation due to the proximity of the Tank Farm to the Norman C. Toole Military Magnet School. The actual demolition portion of this project is scheduled to start on or near 15 July 1998 pending contracting actions. **If SCDHEC has any questions, comments or concerns with the work plan and/or the estimated start date please contact me; and, the demolition efforts will be stopped immediately and the concerns addressed.**

If you have any questions please contact me at (843) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Remedial Project Manager

Encl:
Work Plan - Demolition of Tank "P" (2 copies)

RECEIVED

JUL 8 1998

Water Monitoring, Assessment &
Protection Division



Jali

14 July 1998

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
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Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attn: Mr. Gabriel Magwood

Re: Closure and Assessment Report dated 18 May 1998
Chicora Tank Farm (CTF-1 and CTF-2) (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides a narrative describing closure activities and/or analytical results of environmental sampling to determine if releases have occurred as a result of operation of the referenced vessels and/or associated piping system. The employed closure activities and visual observations appear to indicate that no additional endeavors for remedial actions and/or contaminant characterization is warranted for AST CFT-2 at this time. Please be aware this statement pertains only to the portion of the facility addressed in the referenced document as AST CFT-2 and does not apply to other areas of the facility and/or any other potential regulatory violations. The Department retains the authority to request additional assessments and/or remedial endeavors, as appropriate, if future conditions or information warrant and are deemed necessary.

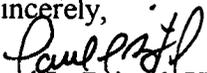
With regard to AST CFT-1, analytical results provided on samples 0589-5 and 0589-6 were reported as BDL (below detection limits) with elevated detection limits. As identified in previous correspondence (Bristol to Amey, 2 September 1997), when detection limits are elevated and contaminant concentrations are reported as zero (0) or BDL it will be assumed that the chemical constituent is equal to the elevated detection limit. With this consideration the reported concentrations approach or exceed levels proposed in the SCAP (soil corrective action plan amended July 1997) for the Charleston Naval Complex and appear to indicate that additional remedial actions are warranted in the areas of the noted sample locations. Additional assessment/corrective action activities proposed in the Tank Management Plan (dated October 1996) should be implemented in an appropriate and timely manner. Employed activities should be technically sufficient and reasonable to determine the extent and severity of suspected contamination. Please be reminded that groundwater sampling, if necessary, will require construction of sampling points and will need to be submitted for prior review and approval, as

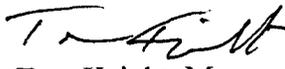
Charleston Naval Complex/Charleston Naval Base
14 July 1998
page 2

appropriate.

Should you have any questions please contact me at (803) 734-5328.

Sincerely,


Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water


Tom Knight, Manager
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



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

Li 5.28.98
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Lo 7.13.98
MAY 20 1998

Water Monitoring, Assessment &
5090 Protection Division
Code 1849
18 May 1998

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

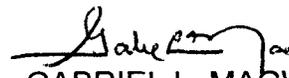
**UST ASSESSMENT REPORT FOR CHARLESTON NAVAL COMPLEX,
CHARLESTON, SC**

Dear Mr. Bristol:

Enclosed are the Assessment Reports for the closure of Aboveground Storage Tanks 1306, CTF-1 and CTF-2 located at the Charleston Naval Complex, Charleston, SC.

If you have any questions please contact me at (843) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Petroleum/UST

Encl:
Assessment Report

BOARD:
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Vice Chairman
Howard L. Brilliant, MD
Secretary



C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

BOARD:
Carl L. Brazell
Louisiana W. Wright
L. Michael Blackmon
Coleman F. Buckhouse, MD

15 April 2004

Commander
NAVFACENGCOM Southern Division
Attn: Code ES24 (Gabriel Magwood)
P.O. Box 190010
North Charleston, SC 29419-9010

Re: CNB – Chicora Tank Farm
Site Identification # 13350
Soil Remediation and Free Product Removal Report received 8 April 2004
Charleston County

Dear Mr. Magwood:

The Department has completed technical review of the referenced document. Interpretation of the analytical data provided in the referenced report indicates that chemicals of concern remain above established Risk-Based Screening Levels in soils at the subject site.

Sampling data included in the report indicates that excavation activities were unsuccessful in removing all of the soil contamination at this site. Although much of the site continues to exceed the RBSL limits for sandy soils, only two areas (trenches 8 & 13) exceeded the residential limits for ingestion and dermal contact. However, two items remain unclear. First, what, if any, continuing treat do the contaminated site soils pose to groundwater quality in the area? Second, no parties have announced a redevelopment plan for this site. As redevelopment is unknown, the use of the most protective RBSL limits (residential) must be employed.

The Department requests that the Navy further remediate the areas around trenches 8 and 13 in an effort to achieve compliance with the residential exposure limits. The Navy should also develop a log term groundwater monitoring plan for this site.

Please submit the requested remediation and LTM plan to the Department no later than 30 September 2004. Should you have any questions please contact me at (803) 898-3553 (office phone), (803) 898-2893 (fax) or by e-mail bishopma@dhec.sc.gov.

Sincerely,

Michael A. Bishop, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC
Jerry Stamps, BLWM
Ray Hoekstra, PE – STEP, 1006 Floyd Culler Court, Oak Ridge TN 37830
Technical File

BOARD:
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Chairman
Mark B. Kent
Vice Chairman
Howard L. Brilliant, MD
Secretary



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Coleman F. Buckhouse, MD

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

30 July 2003

Commander
NAVFACENGCOM Southern Division
Attn: Code ES24 (Gabriel Magwood)
P.O. Box 190010
North Charleston, SC 29419-9010

Re: CNB – Chicora Tank Farm
Site Identification # 13350
Corrective Action Interim Report received 30 July 2003
Charleston County

Dear Mr. Magwood:

The Department has completed technical review of the referenced document. Sampling data included in the report indicates that soil contamination continues at this site. The Department concurs with the conclusion as presented in the report that additional soil characterization and remediation activities are necessary at this facility.

The proposal to conduct additional soil sampling and remediation activities is approved for immediate implementation. Please note that all environmental soil sampling borings shall be installed, maintained, and abandoned in accordance with South Carolina Well Standards R.61-71 (I.3 a-f). In addition, all soil and/or water sampling shall be conducted in accordance with the South Carolina Risk-Based Corrective Action for Petroleum Releases guidance document dated 15 May 2001.

The DHEC Trident District Office shall be notified at least 48 hours prior to commence of field activities at this site. The contact number is 740-1590. Please submit a report detailing the results of the soil sampling and remediation efforts no later than 28 November 2003.

Should you have any questions please contact me at (803) 898-3553 (office phone), (803) 898-2893 (fax) or by e-mail bishopma@dhec.sc.gov.

Sincerely,

Michael A. Bishop, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC
Jerry Stamps, BLWM
Technical File



TETRA TECH NUS, INC.

1401 Oven Park Drive • Suite 102 • Tallahassee, FL 32312
(850) 385-9899 • FAX (850) 385-9860 • www.tetrattech.com

August 10, 2001

Project Number 0174

Mr. Michael Bishop
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0174

Subject: Chicora Tank Farm
SCDHEC Site Identification # 13350
Charleston Naval Complex
Charleston, South Carolina

Dear Mr. Bishop:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, Tetra Tech, NUS, Inc. (TtNUS) is requesting approval to perform free product recovery activities at the referenced site. TtNUS will perform the free product recovery activities in accordance with applicable local, state and federal regulations.

Background

The Chicora Tank Farm was formerly used to store Bunker "C" Fuel, Navy Special Fuel, and Diesel Marine Fuel. All of the tanks at this location were removed in 1999 and the facility is no longer in use. During closure assessment activities, petroleum contamination was discovered along a fuel transfer pipeline while exposing a valve pit to clean the fuel transfer line. A Tank Closure Assessment Report and Rapid Assessment Report (RAR) were submitted and accepted by the South Carolina Department of Health and Environmental Controls (SCDHEC). The RAR recommended an Intrinsic Corrective Action Plan (CAP) for monitored natural attenuation of groundwater.

In May 2001 TtNUS personnel performed a baseline groundwater sampling event to provide baseline analytical data for preparation of the CAP. During the sampling event, free product was detected in monitoring wells CNCM-07 and CNCM-13.

Proposed Activities

The Navy has tasked TtNUS to perform free product recovery from two monitoring wells at the site on a bi-weekly basis. The free product recovery will continue until September 30, 2001, unless otherwise determined by the Government to be needed less frequently or for a shorter duration.

TtNUS will subcontract the services of a vacuum extraction truck and operator. Prior to each vacuum extraction event, TtNUS personnel will gauge the wells to monitor the thickness of free

RECEIVED

AUG 13 2001

**Water Monitoring, Assessment &
Protection Division**

Mr. Michael Bishop
SCDHEC
August 10, 2001 - Page 2

product and to evaluate the effectiveness of the recovery activities. At the conclusion of each event, TtNUS personnel will document the method of removal, the quantity removed, and method of disposal. Each event will be approximately two days in duration: one day to mobilize to the site and to gauge each well, and one day to oversee vacuum extraction activities and demobilize from the site. The first event is scheduled for the week of August 13, 2001. Three subsequent events will be conducted bi-weekly prior to September 30, 2001.

Due to the low yield of the monitoring wells at the Chicora Tank Farm, it is anticipated that the petroleum/water mixture will be extracted intermittently by periodically moving the vacuum extraction truck between the two wells. This will allow the groundwater in each well to recover while the other well is being vacuumed.

Air toxic emissions calculations have been prepared for each identified chemical of concern. Air dispersion modeling results suggest that the air toxics emitted will meet the SCDHEC Bureau of Air Quality Control (BAQC) Air Toxic Standards. A SCDHEC BAQC UST Modeling Information Sheet is attached along with the air toxic emissions calculations and a figure showing the monitoring well locations. No structures are located within a radius of five stack heights from the monitoring wells with free product. For verification, vacuum truck stack emissions will be monitored approximately ½ hour after the first event is started and approximately ½ hour prior to completion of the first event. A Sensidyne® sampling pump equipped with a General Hydrocarbon detection tube (No. 187S) will be used to perform the monitoring. This data will be used to verify that air toxic concentrations emitted meet the SCDHEC Air Toxic Standards. If air monitoring indicates that SCDHEC Air Toxic Standards may be exceeded, appropriate engineering controls will be implemented to reduce emissions.

At the conclusion of the final free product recovery event, a letter report will be prepared that includes the method of petroleum/water mixture removal, quantity of mixture removed, and method of disposal. One paper copy of the final report will be submitted to the SCDHEC, along with one paper copy and two CD copies to the Government.

If you have any questions regarding this initiative or require additional information, please contact me at (850) 385-9899.

Sincerely,

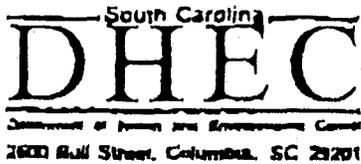


Paul E. Calligan, P.G.
Task Order Manager

Enclosures

c: Mr. Gabriel Magwood, SOUTHDIV
Debbie Wroblewski (Cover Letter Only)
Mark Perry (Unbound)

Attachments



Commissioner, Michael D. Jarvis

Board: William E. Anagnostis, III, Chairman
John M. Burnett, Vice Chairman
Richard E. Jansour, DDS, Secretary

Toney Graham, Jr., MD
Sandra J. Moulder
John B. Paine, MD
Robert J. Strasing, Jr.

Preserving Health, Protecting the Environment

BAQC USE MODELING INFORMATION

PLEASE FILL OUT COMPLETELY

SITE/COMPANY NAME: Charleston Naval Complex, US Navy GWPD ID#: _____

CLEANUP LOCATION: Site 42, Chicora Tank Farm

North Charleston, South Carolina

TYPE OF OPERATION (i.e. AIR STRIPPER): Mobile Dual Phase Extraction (MDES)

CONTACT: Paul Callican PHONE: (813) 806-0202

SITE MAPS

Please include a scaled plot plan of the site location that clearly shows distances from the stack to the property boundaries. All buildings and/or structures within a radius of 5 stack heights (measured from the stack/vent) shall be incorporated on this plot plan and information on each building and/or structure's height, width, and length shall also be included.

STACK INFORMATION

HEIGHT ABOVE GROUND 9 FEET; DIAMETER 0.4 FEET
 TEMPERATURE 120 F; VELOCITY 8.3 FEET/SECOND

AIR TOXIC INFORMATION

AIR TOXIC EMITTED (i.e. BENZENE)	CHEMICAL ABSTRACT SERVICE (CAS) NUMBER	EMISSION RATE LB/HR
A) <u>Naphthalene</u>	<u>91-20-3</u>	<u>0.0000943</u>
B) _____	_____	_____
C) _____	_____	_____
D) _____	_____	_____
E) _____	_____	_____

Please submit this completed sheet with scaled site maps to the appropriate SCDEEC project manager at the Ground-Water Protection Division, 2600 Bull Street, Columbia, SC 29201.

Mobile Dual Phase Extraction System (MDES) Air Emission Calculations

- Assume the vacuum truck tank has a 800 gallon capacity.
- The operational time will continue until the tank truck is full (assumed 8 hours).
- The site contaminant is naphthalene (the only analyte to exceed regulatory criteria)
- The highest concentration of naphthalene detected at the site was 113 micrograms/liter (ug/l)

The US EPA guidance document "How to Evaluate Cleanup Technologies for Underground Storage Tank Sites" 1995, states:

Henry's law constant is the partition coefficient that relates the concentration of a constituent dissolved in water to its partial vapor pressure under equilibrium conditions. It describes the relative tendency for a dissolved constituent to exist in the vapor phase. Henry's law constant is a measure of the degree to which constituents will volatilize for physical removal by dual-phase extraction (DPE). Constituents with Henry's Law constants of greater than 100 atmospheres are considered sufficiently volatile to be physically removed with extracted vapor.

The Henry's Law constant for Naphthalene is 72 atmospheres. Therefore, it is assumed that naphthalene is not volatile enough to be physically removed with the extracted vapors and that emissions will result as free product and groundwater are extracted and deposited in the vacuum truck tank.

Past MDES events indicate that free product concentrations are removed in the initial 15 to 30 minutes of operation, and the subsequent 7.5 hours, only groundwater and vapor are extracted from the wells. Additionally, the concentration of dissolved phase hydrocarbons is expected to decrease as the operational time increases. To account for the free product and for a conservative estimate, the highest concentration of naphthalene detected at the site will be used in mass estimates for the entire duration of the MDES event. Additionally, it will be assumed that all naphthalene extracted from groundwater will be emitted into the air.

Therefore:

When full, the tanker truck will hold 800 gallons or 3028 liters.

The highest detected concentration of naphthalene at the site was 113 ug/l.

$113 \text{ ug/l} \times 3028 \text{ liters} = 324,164 \text{ ug of Naphthalene or } 0.342164 \text{ grams of Naphthalene}$

If all naphthalene volatilizes and is emitted to the air the total air emissions would be:

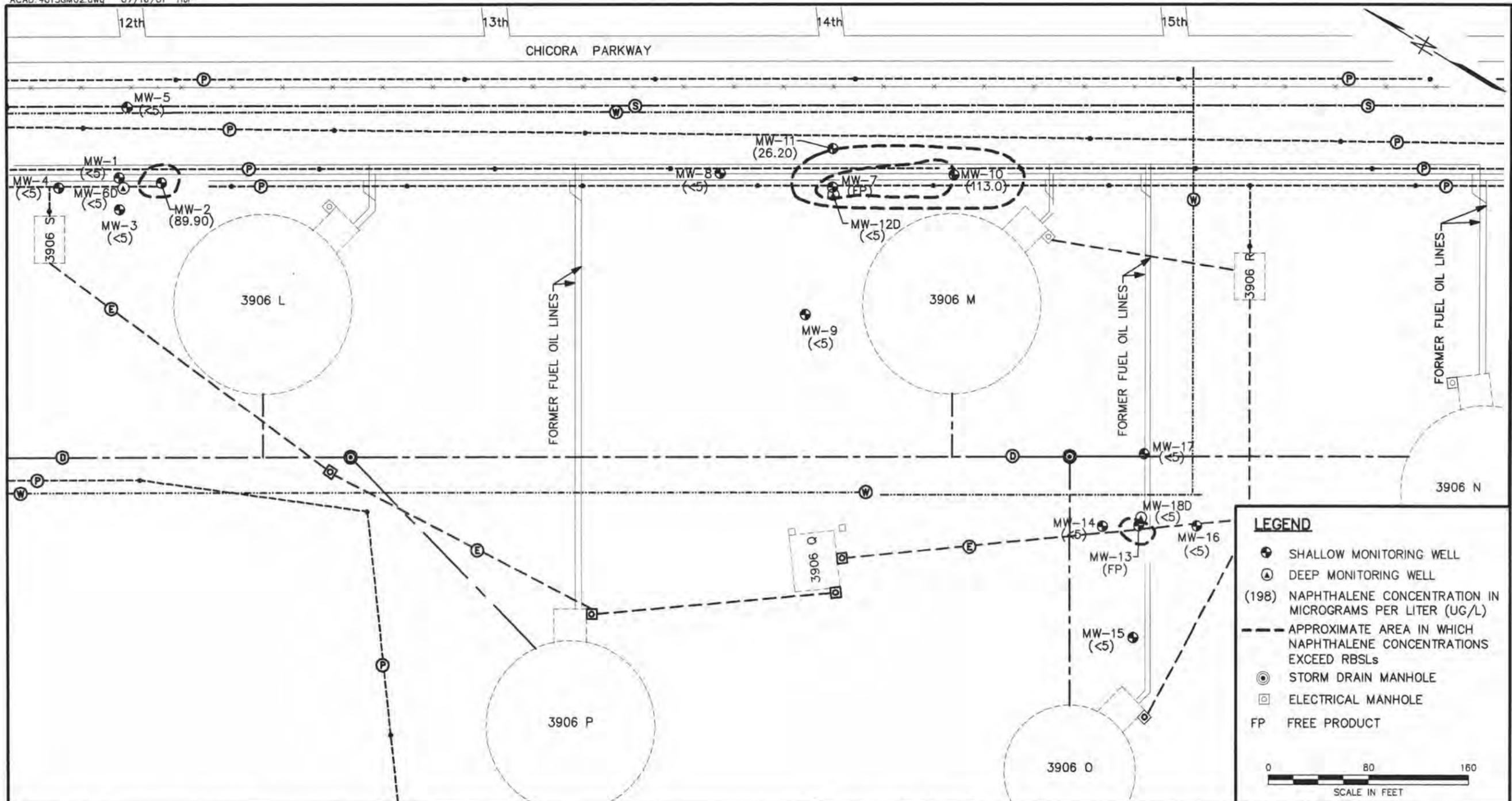
0.342164 grams

or

0.007545 pounds

Therefore:

$0.007545 \text{ pounds} / 8 \text{ hours} = 0.000943 \text{ pound/hour}$



LEGEND

- SHALLOW MONITORING WELL
- ⊙ DEEP MONITORING WELL
- (198) NAPHTHALENE CONCENTRATION IN MICROGRAMS PER LITER (UG/L)
- - - APPROXIMATE AREA IN WHICH NAPHTHALENE CONCENTRATIONS EXCEED RBSLS
- ⊙ STORM DRAIN MANHOLE
- ⊠ ELECTRICAL MANHOLE
- FP FREE PRODUCT

0 80 160
SCALE IN FEET

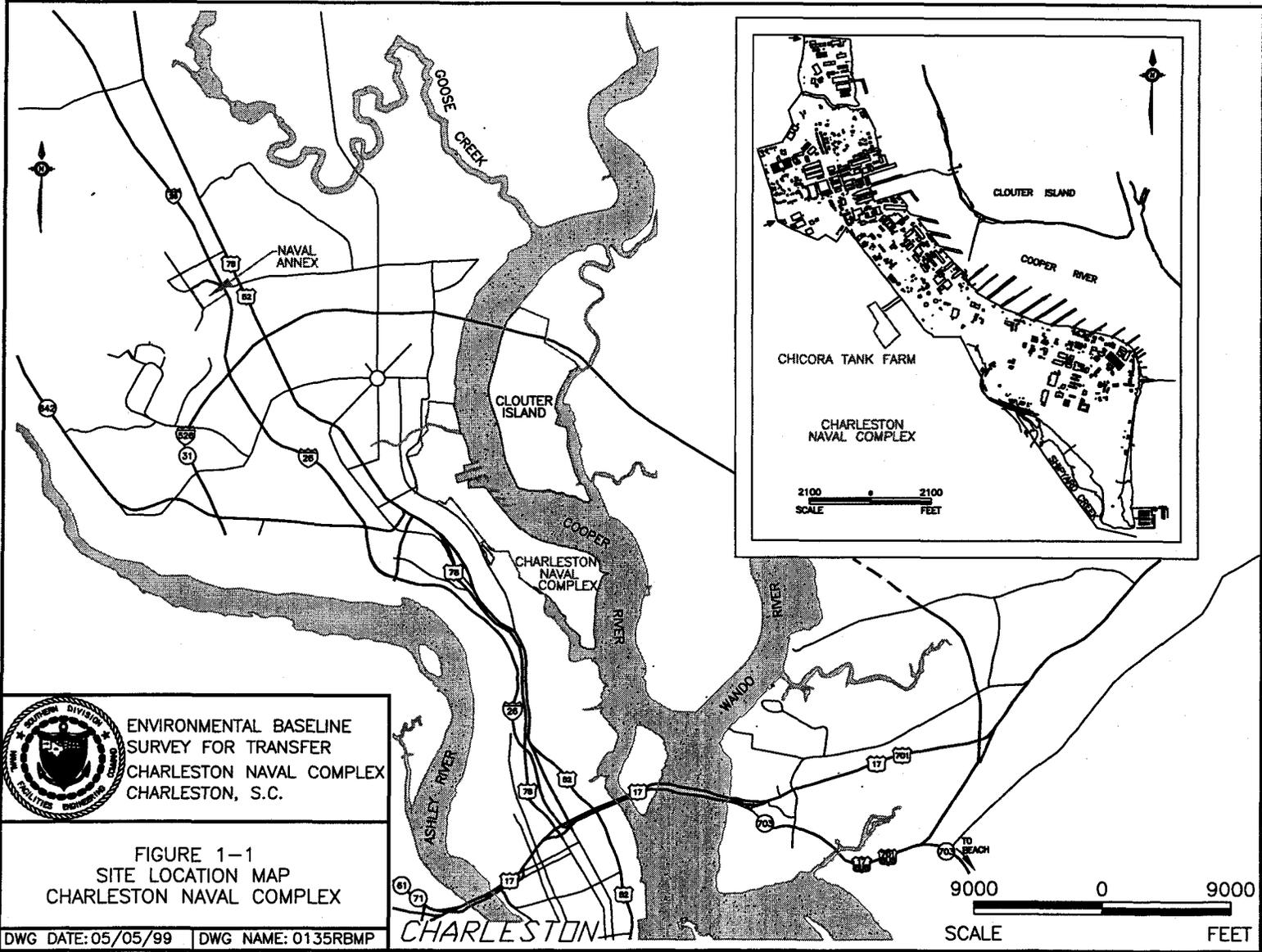
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

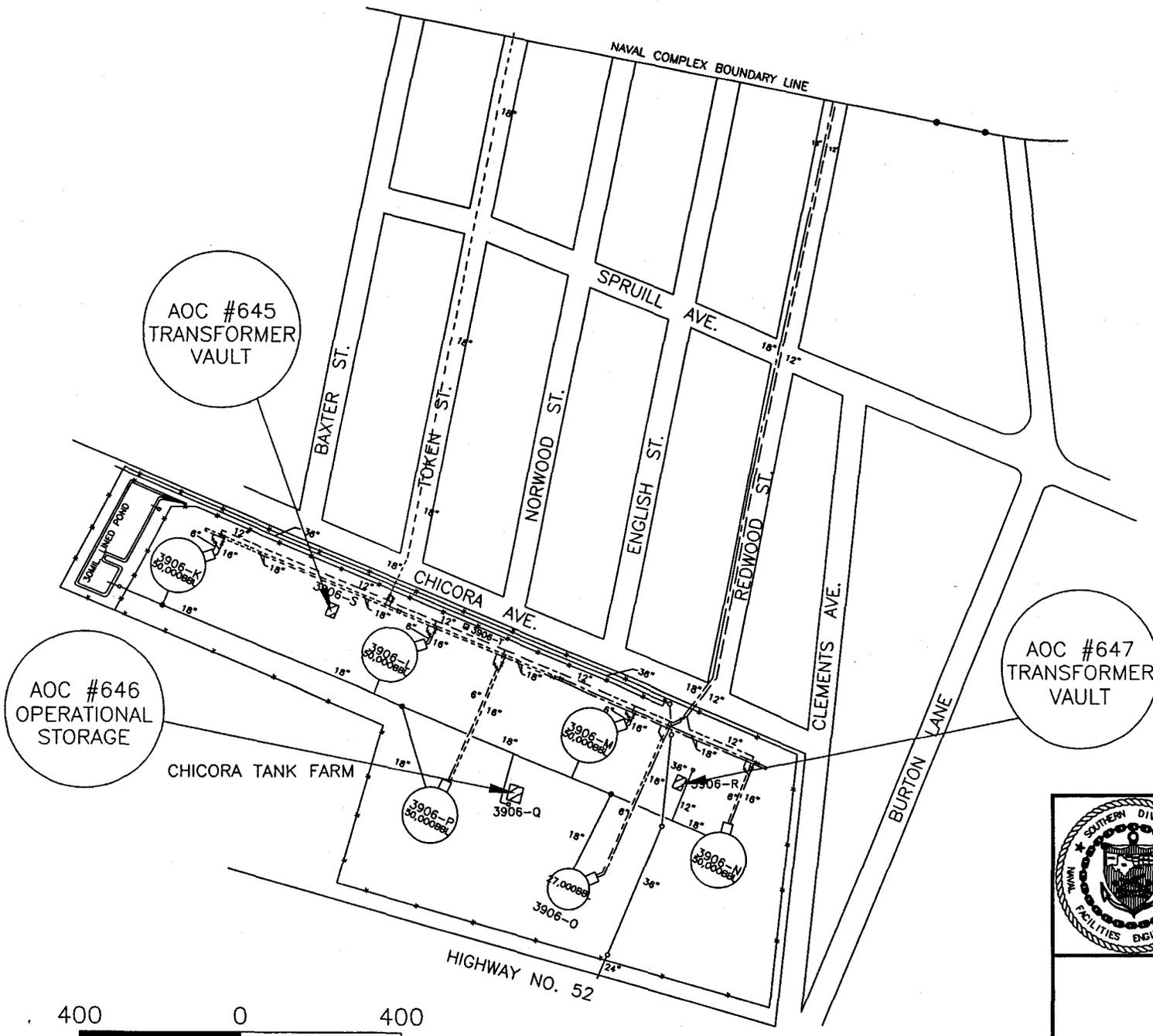
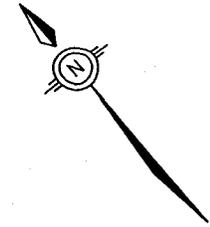
DRAWN BY HJP DATE 7/15/01
 CHECKED BY DATE
 COST/SCHED-AREA
 SCALE AS NOTED



GROUNDWATER NAPHTHALENE MAP
 CHICORA TANK FARM - SITE 42
 CHARLESTON NAVAL SHIPYARD
 CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 4015
 APPROVED BY DATE
 APPROVED BY DATE
 DRAWING NO. FIGURE 7
 REV. 0





- LEGEND
- FUEL OIL
 - - - SLUDGE LINES
 - DRAIN LINES
 - - - DIESEL LINES
 - CATCH BASIN
 - ⊕ VALVE
 - MANHOLE

AOC #646
OPERATIONAL
STORAGE

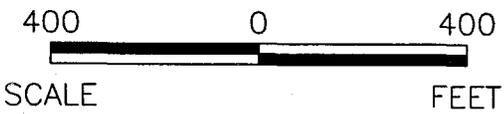
AOC #645
TRANSFORMER
VAULT

AOC #647
TRANSFORMER
VAULT



ENVIRONMENTAL
BASELINE SURVEY
NAVAL BASE CHARLESTON
CHARLESTON, S.C.

FIGURE 5-1
AREAS OF CONCERN
CHICORA TANK FARM
CHARLESTON NAVAL COMPLEX





TETRA TECH NUS, INC.

5421 Beaumont Center Blvd., Suite 660, Tampa, FL 33634-5200
(813) 806-0202 • FAX (813) 806-0405 • www.tetrattech.com

TtNUS/TPA-02-008/4015-3.2

April 26, 2002

Project Number 4015

Mr. Michael Bishop
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0174

Subject: Chicora Tank Farm
SCDHEC Site Identification #13350
Charleston Naval Complex
North Charleston, South Carolina

Dear Mr. Bishop:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, Tetra Tech, NUS, Inc. (TtNUS) is pleased to submit the results of free product recovery activities conducted at the referenced site.

Background

The Chicora Tank Farm was formerly used to store Bunker "C" Fuel, Navy Special Fuel, and Diesel Marine Fuel. All of the tanks at this location were removed in 1999 and the facility is no longer in use. During closure assessment activities, petroleum contamination was discovered along a fuel transfer pipeline while exposing a valve pit to clean the fuel transfer line. A Tank Closure Assessment Report and Rapid Assessment Report (RAR) were submitted and accepted by SCDHEC. The RAR recommended an intrinsic Corrective Action Plan (CAP) for monitored natural attenuation of groundwater.

In May 2001 TtNUS personnel performed a baseline groundwater sampling event to provide baseline analytical data for preparation of the CAP. During the sampling event, free product was detected in two of the monitoring wells located at the site. As a result, the Navy tasked TtNUS to perform free product recovery from the two monitoring wells on a bi-weekly basis for eight weeks.

On Site Activities

TtNUS mobilized to Chicora Tank Farm on August 21, 2001 to conduct the first of four free-product recovery events using a vacuum extraction truck. The remaining three recovery events occurred on August 31, 2001, September 18, 2001, and October 12, 2001.

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APR 29 2002

**Water Monitoring, Assessment &
Protection Division**

Mr. Michael Bishop
SCDHEC
April 26, 2002 - Page 2 of 2

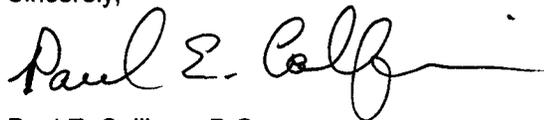
Prior to the initial recovery event, air toxic emissions calculations were prepared for each identified chemical of concern. Air dispersion modeling results suggested that the air toxins emitted would meet the SCDHEC Bureau of Air Quality Control (BAQC) Air Toxic Standards. The air toxic emissions calculations were submitted to the SCDHEC in a letter dated August 10, 2001. An air permit waiver was subsequently issued by the BAQC on August 16, 2001. To provide verification, during the first recovery event, vacuum truck stack emissions were monitored approximately ½-hour after the recovery activities were started and continued every half-hour until the recovery process concluded. A Sensidyne® sampling pump equipped with a General Hydrocarbon detection tube (No. 187S) was used to perform the monitoring. The emission data is presented in Table 1.

Prior to the start of each vacuum extraction event, water level measurements were collected from all monitoring wells at Chicora Tank Farm. Water level measurements were also collected after each event. During the second recovery event conducted on August 31, 2001, free product was discovered in a third monitoring well (CNC42MW-01). Recovery activities were expanded to include the additional well during the remaining extraction events. The pre and post event water levels are presented in Table 2.

During the initial recovery event on August 21, 2001, approximately 500 gallons of water/petroleum mixture was extracted from CNC42MW-07 and CNC42MW-13 (combined total for both wells). During each of the three subsequent recovery events conducted on August 31, 2001, September 18, 2001, and October 12, 2001, approximately 500 gallons of water/petroleum mixture was extracted from CNC42MW-01, CNC42MW-07 and CNC42MW-13 (combined total for all three wells). The water/petroleum mixture was disposed of by the vacuum extraction truck subcontractor at Water Recovery Systems, LLC in Charleston, South Carolina. The disposal manifests for each event are included as Attachment A.

If you have any questions regarding this submittal, please contact me by phone at (813) 806-0202 or via e-mail at calliganp@ttnus.com.

Sincerely,



Paul E. Calligan, P.G.
Task Order Manager

Enclosures

C: Mr. Gabriel Magwood, SOUTH DIV
Debbie Wroblewski (Cover Letter Only)
Mark Perry (Unbound)

TABLES

**TABLE 1
EMISSIONS DATA
CHICORA TANK FARM
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA**

Location	Date	Reading No.	PPM	Start Time	End Time	Total time (Min:Sec)
MW-07	8/21/2001	1	20	9:25	9:29:30	4:30
	8/21/2001	2	0	9:55	9:59:10	4:10
	8/21/2001	3	0	10:25	10:30:55	5:55
MW-13	8/21/2001	1	0	13:35	13:40:10	5:10
	8/21/2001	2	20	14:06	14:13:20	6:20
	8/21/2001	3	20	14:38	14:45:15	7:15
	8/21/2001	4	20	15:05	15:11:10	6:10

TABLE 2
FREE PRODUCT RECOVERY DATA
CHICORA TANK FARM
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA
PAGE 1 OF 3

Monitoring Well Number	Date	Depth to Water before Free Product Recovery	Depth to Water after Free Product Recovery	Difference between before and after Free Product Removal	Amount of Free Product (inches)
CNC42-MW01	08/20/01-08/21/01	nm	nm	na	Unknown
	08/30/01-08/31/01	5.90	6.41	-0.51	6.00
	09/17/01-09/18/01	5.04	6.14	-1.10	0.13
	10/11/01-10/12/01	5.98	7.46	-1.48	0.13
CNC42-MW02	08/20/01-08/21/01	nm	nm	na	na
	08/30/01-08/31/01	6.91	7.44	-0.53	na
	09/17/01-09/18/01	6.49	6.69	-0.20	na
	10/11/01-10/12/01	6.98	7.15	-0.17	na
CNC42-MW03	08/20/01-08/21/01	nm	nm	na	na
	08/30/01-08/31/01	6.26	6.51	-0.25	na
	09/17/01-09/18/01	5.80	5.99	-0.19	na
	10/11/01-10/12/01	6.03	6.24	-0.21	na
CNC42-MW04	08/20/01-08/21/01	nm	nm	na	na
	08/30/01-08/31/01	4.99	5.14	-0.15	na
	09/17/01-09/18/01	4.49	4.64	-0.15	na
	10/11/01-10/12/01	5.07	5.23	-0.16	na
CNC42-MW05	08/20/01-08/21/01	nm	nm	na	na
	08/30/01-08/31/01	7.28	7.33	-0.05	na
	09/17/01-09/18/01	6.77	6.98	-0.21	na
	10/11/01-10/12/01	7.36	7.39	-0.03	na
CNC42-MW06D	08/20/01-08/21/01	nm	nm	nm	na
	08/30/01-08/31/01	6.54	6.81	-0.27	na
	09/17/01-09/18/01	6.29	6.21	0.08	na
	10/11/01-10/12/01	8.11	8.15	-0.04	na
CNC42-MW07	08/20/01-08/21/01	5.33	6.62	-1.29	unknown
	08/30/01-08/31/01	5.72	6.39	-0.67	4.00
	09/17/01-09/18/01	4.90	6.34	-1.44	0.13
	10/11/01-10/12/01	5.69	7.85	-2.16	0.13

nm - not measured
na - not applicable

TABLE 2
FREE PRODUCT RECOVERY DATA
CHICORA TANK FARM
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA
PAGE 2 OF 3

Monitoring Well Number	Date	Depth to Water before Free Product Recovery	Depth to Water after Free Product Recovery	Difference between before and after Free Product Removal	Amount of Free Product (inches)
CNC42-MW08	08/20/01-08/21/01	4.00	4.29	-0.29	na
	08/30/01-08/31/01	4.43	4.61	-0.18	na
	09/17/01-09/18/01	3.61	3.51	0.10	na
	10/11/01-10/12/01	4.37	4.68	-0.31	na
CNC42-MW09	08/20/01-08/21/01	8.19	8.43	-0.24	na
	08/30/01-08/31/01	8.41	8.67	-0.26	na
	09/17/01-09/18/01	7.83	8.15	-0.32	na
	10/11/01-10/12/01	8.36	8.54	-0.18	na
CNC42-MW10	08/20/01-08/21/01	6.23	6.22	0.01	na
	08/30/01-08/31/01	6.39	6.48	-0.09	na
	09/17/01-09/18/01	6.03	6.08	-0.05	na
	10/11/01-10/12/01	6.25	6.39	-0.14	na
CNC42-MW11	08/20/01-08/21/01	4.49	5.41	-0.92	na
	08/30/01-08/31/01	4.93	5.79	-0.86	na
	09/17/01-09/18/01	4.13	5.15	-1.02	na
	10/11/01-10/12/01	4.91	5.69	-0.78	na
CNC42-MW12D	08/20/01-08/21/01	5.37	5.27	0.10	na
	08/30/01-08/31/01	5.59	5.85	-0.26	na
	09/17/01-09/18/01	5.08	5.03	0.05	na
	10/11/01-10/12/01	5.53	5.59	-0.06	na
CNC42-MW13	08/20/01-08/21/01	4.66	9.20	-4.54	unknown
	08/30/01-08/31/01	4.78	5.91	-1.13	0.13
	09/17/01-09/18/01	4.07	4.95	-0.88	0.13
	10/11/01-10/12/01	4.71	6.64	-1.93	0.13
CNC42-MW14	08/20/01-08/21/01	4.89	4.95	-0.06	na
	08/30/01-08/31/01	5.00	5.03	-0.03	na
	09/17/01-09/18/01	4.65	4.70	-0.05	na
	10/11/01-10/12/01	4.97	5.11	-0.14	na

nm - not measured
na - not applicable

TABLE 2
FREE PRODUCT RECOVERY DATA
CHICORA TANK FARM
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA
PAGE 3 OF 3

Monitoring Well Number	Date	Depth to Water before Free Product Recovery	Depth to Water after Free Product Recovery	Difference between before and after Free Product Removal	Amount of Free Product (inches)
CNC42-MW15	08/20/01-08/21/01	7.98	8.01	-0.03	na
	08/30/01-08/31/01	8.20	8.19	0.01	na
	09/17/01-09/18/01	7.75	7.81	-0.06	na
	10/11/01-10/12/01	8.11	8.19	-0.08	na
CNC42-MW16	08/20/01-08/21/01	4.31	4.37	-0.06	na
	08/30/01-08/31/01	4.43	4.52	-0.09	na
	09/17/01-09/18/01	3.99	4.09	-0.10	na
	10/11/01-10/12/01	4.33	4.46	-0.13	na
CNC42-MW17	08/20/01-08/21/01	4.28	4.37	-0.09	na
	08/30/01-08/31/01	4.36	4.39	-0.03	na
	09/17/01-09/18/01	4.09	4.08	0.01	na
	10/11/01-10/12/01	4.20	4.32	-0.12	na
CNC42-MW18D	08/20/01-08/21/01	4.28	4.16	0.12	na
	08/30/01-08/31/01	4.48	4.48	0.00	na
	09/17/01-09/18/01	4.07	4.02	0.05	na
	10/11/01-10/12/01	4.39	4.44	-0.05	na

nm - not measured
na - not applicable

ATTACHMENT A



No. W/20973

MANIFEST - NON-HAZARDOUS WASTEWATER

1. Generator's EPA ID# (if applicable) <u>SC0170022560</u>		Waste ID Number <u>13806</u>			
2. Generator's Name and Mailing Address: <u>SOUTH NAVAL FACILITY</u> Phone (<u>843</u>) <u>743-9985</u> <u>CHARLESTON NAVAL COMPLEX (CSD)</u> <u>P.O. Box 190010</u> <u>CHARLESTON SC 29419-0010</u>					
3. Agent of Generator and Mailing Address: <u>Tetra Tech NUS</u> <u>1401 Owen Park Dr. Ste 1024</u> <u>Tallahassee, FL 32301</u>		Phone (<u>850</u>) <u>385-9899</u>			
4. Transporter Company Name: <u>EPG Inc</u> <u>Wando Ln</u> <u>MT. Pleasant</u>		Phone (<u>843</u>) <u>881-0467</u>			
5. Transporter U.S. EPA ID#: <u>SCD 980837504</u>					
6. Designated Facility Name and Site Address: <u>Water Recovery Systems, LLC, PO Box 70971, Charleston, SC 29415</u> Site address: <u>1500 Greenleaf Street, Charleston, SC 29405</u> <u>(843) 566-7067</u> <u>(843) 566-7068 - FAX</u>					
7. Designated Facility U.S. EPA ID#:					
8. U.S. DOT Description (including proper shipping name, hazard class, generator name, address & contact)	9. Container		10. Total Quantity	11. Unit	
	No.	Type			
	a. <u>Non-Regulated</u> <u>Non-Hazardous Wastewater</u>	<u>1</u>	<u>TK</u>	<u>VACTOR</u>	<u>555 Gallons</u>
	b.				
	c.				
d.					
12. Generator's Certification: I hereby declare that the contents of this consignment are not hazardous by definition or listing and are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. I further certify that the contents of this consignment are as represented by the description contained on the Waste Profile Form previously submitted to and approved by the Designated Facility.					
Printed/Typed Name <u>RICHARD G. NIELSON</u>		Signature <u>[Signature]</u>		Month Day Year <u>8/21/01</u>	
13. Transporter Acknowledgement of Receipt of Materials					
Printed/Typed Name <u>AL MAURCY</u>		Signature <u>[Signature]</u>		Month Day Year <u>8-21-01</u>	
14. Discrepancy Indication Space					
Facility Owner or Operator: Certification of Receipt of Materials					
Printed/Typed Name <u>David Wood</u>		Signature <u>[Signature]</u>		Month Day Year <u>8-21-01</u>	



No. W20973-4

MANIFEST - NON-HAZARDOUS WASTEWATER

1. Generator's EPA ID# (if applicable) **SC 0170022560** Waste ID Number **1380**

2. Generator's Name and Mailing Address: **SOUTH NAV PAC ENGR COM** Phone (853) 743 9985
CHARLESTON NAVAL COMPLEX
PO BOX 190010 CHARLESTON SC 29419-7010

3. Agent of Generator and Mailing Address: Phone (850) 385 9899
TETRA TECH NAS
1401 OVER PARK DRIVE SUITE 102
TALLAHASSEE, FLA. 32301

4. Transporter Company Name: Phone (843) 881 0467
EPG Inc
527 WANDO LN
MT. PLEASANT SC 29465

5. Transporter U.S. EPA ID#:

6. Designated Facility Name and Site Address:
 Water Recovery Systems, LLC, PO Box 70971, Charleston, SC 29415
 Site address: 1500 Greenleaf Street, Charleston, SC 29405
 (843) 566-7067
 (843) 566-7068 - FAX

7. Designated Facility U.S. EPA ID#:

8. U.S. DOT Description (including proper shipping name, hazard class, generator name, address & contact)	9. Container		10. Total Quantity	11. Unit
	No.	Type		
a. Non-Regulated Non-Hazardous Wastewater	1	TK	500	Gallons
b.				
c.				
d.				

12. Generator's Certification: I hereby declare that the contents of this consignment are not hazardous by definition or listing and are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. I further certify that the contents of this consignment are as represented by the description contained on the Waste Profile Form previously submitted to and approved by the Designated Facility.

Printed/Typed Name **Amy Danell** Signature **Amy Danell** Month Day Year **3/31/01**

13. Transporter Acknowledgement of Receipt of Materials
 Printed/Typed Name **A. Marney** Signature **A. Marney** Month Day Year **3-31-01**

14. Discrepancy Indication Space

Facility Owner or Operator: Certification of Receipt of Materials
 Printed/Typed Name **David Ward** Signature **David Ward** Month Day Year **3-31-01**



No. W91034-2

MANIFEST - NON-HAZARDOUS WASTEWATER

1. Generator's EPA ID# (if applicable) <u>SC0170022560</u>		Waste ID Number <u>13811</u>	
2. Generator's Name and Mailing Address: <u>SOUTH NAV FAC</u> <u>Charleston NAVAL complex (C50)</u> <u>PO Box 190010, Charleston SC 29419-9010</u>		Phone (<u>843</u>) <u>743-9985</u>	
3. Agent of Generator and Mailing Address: <u>Tetra Tech NUS</u> <u>1401 OPEN PARK DRIVE SUITE 102</u> <u>TALLAHASSEE, FL 32301</u>		Phone (<u>850</u>) <u>385-9899</u>	
4. Transporter Company Name: <u>ENVIRONMENTAL PROJECTS GROUP</u> <u>527 WANDO LANE</u> <u>MT PLEASANT, SC 29465</u>		Phone (<u>843</u>) <u>881-0467</u>	
5. Transporter U.S. EPA ID#:			
6. Designated Facility Name and Site Address: Water Recovery Systems, LLC, PO Box 70971, Charleston, SC 29415 Site address: 1500 Greenleaf Street, Charleston, SC 29405 (843) 566-7067 (843) 566-7068 - FAX			
7. Designated Facility U.S. EPA ID#:			
8. U.S. DOT Description (including proper shipping name, hazard class, generator name, address & contact)	9. Container No.	9. Container Type	10. Total Quantity
a. Non-Regulated Non-Hazardous Wastewater	<u>061</u>	<u>TK</u>	<u>500</u>
b.			
c.			
d.			
11. Unit <u>Gallons</u>			
12. Generator's Certification: I hereby declare that the contents of this consignment are not hazardous by definition or listing and are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. I further certify that the contents of this consignment are as represented by the description contained on the Waste Profile Form previously submitted to and approved by the Designated Facility.			
Printed/Typed Name <u>RICHARD G. NIELSON</u>		Signature <u>[Signature]</u>	Month Day Year <u>9/18/01</u>
13. Transporter Acknowledgement of Receipt of Materials			
Printed/Typed Name <u>JOHN CURLEY</u>		Signature <u>[Signature]</u>	Month Day Year <u>9-18-01</u>
14. Discrepancy Indication Space			
Facility Owner or Operator: Certification of Receipt of Materials			
Printed/Typed Name <u>Kevin Livens</u>		Signature <u>[Signature]</u>	Month Day Year <u>9/18/01</u>



11/14/2001

2600 Bull Street
Columbia, SC 29201-1708

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Commander
NAVFACENCOM Southern Division
Attn: Code ES24 (Gabriel Magwood)
P.O. Box 190010
North Charleston, SC 29419-9010

Re: CNB - Chicora Tank Farm
Site Identification # 13350
Free Product Removal Proposal received 13 August 2001
Charleston County

Dear Mr. Magwood:

The Department has reviewed your request to conduct free product recover at this location. The Department of the Navy is authorized to commence recovery activities as defined in the referenced proposal immediately. The Bureau of Air Quality has reviewed the proposal and determined that an air permit is not required for the proposed activities as outlined in the request.

Upon completion of site activities, please provide the Department with a report detailing the recovery efforts and results.

Should you have any questions please contact me at (803) 898-3553 (office phone), (803) 898-3795 (fax) or by e-mail bishopma@columb32.dhec.state.sc.us. Please reference Site ID # 13350 on all future correspondence.

Sincerely,

Michael A. Bishop, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC (w/enc)
Technical File (w/enc)
Paul Bergstrand, SCDHEC-BLWM (n/enc)
Paul Calligan, P.G., TTNUS, 1401 Oven Park Dr., Suite 102, Tallahassee, FL 32312



TETRA TECH NUS, INC.

1401 Oven Park Drive • Suite 102 • Tallahassee, FL 32312
(850) 385-9899 • FAX (850) 385-9860 • www.tetrattech.com

March 30, 2001

Project Number 0174

Mr. Michael Bishop
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

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APR 4 2001

Water Monitoring, Assessment &
Protection Division

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0174

Subject: Chicora Tank Farm
SCDHEC Site Identification # 13350
Charleston Naval Complex
Charleston, South Carolina

Dear Mr. Bishop:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, Tetra Tech, NUS, Inc. (TtNUS) is requesting approval to perform a groundwater sampling event at the referenced site. The sampling event is being conducted to provide baseline analytical data for preparation of an Intrinsic Corrective Action Plan (ICAP). This groundwater sampling event was deemed necessary due to the time that has elapsed since the last sampling event was conducted in September, 1999.

Groundwater samples will be collected to determine the concentrations of chemicals of concern (COCs) in all of the 18 groundwater monitoring wells at the site. Groundwater samples from 11 monitoring wells (CNC42-M01, M02, M03, M05, M07, M09, M10, M11, M13, M15, and M17) will be analyzed for dissolved oxygen, carbon dioxide, alkalinity, ferrous iron, nitrate, sulfate, sulfide, and methane. These parameters will be used to evaluate whether intrinsic remediation is reducing the concentrations of COCs.

TtNUS will perform the groundwater monitoring activities at Chicora Tank Farm in accordance with the sampling procedures and methods described in Section 4.0 of the TtNUS Site Assessment Plan for CNC Zone I, previously submitted to the SCDHEC in May 1999.

If you have any questions regarding this initiative or require additional information, please contact me at (850) 385-9899.

Sincerely,


Paul E. Calligan, P.G.
Task Order Manager

c: Mr. Gabriel Magwood, SOUTHDIV
Debbie Wroblewski (Cover Letter Only)
Mark Perry (Unbound)



2600 Bull Street
Columbia, SC 29201-1708

6 April 2001

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Larry R. Chewning, Jr., DMD

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION NAVAL FEC
GABRIEL MAGWOOD
2155 EAGLE DRIVE
N. CHARLESTON SC 29406

RE: Chicora Tank Farm
Site ID # 13350
Groundwater Sampling request received 4 April 2001
Charleston County

Dear Mr. Magwood:

The Department has completed technical review of the referenced request. As submitted, the request provides for additional investigative activities to determine the extent and severity of contamination, if any, associated with a suspected release from the referenced UST. Based on the information provided, the proposal to perform groundwater sampling is approved for implementation. Upon completion of investigative activities, the Department shall be provided with a report of findings.

Should you have any questions please contact me at 803-898-3553 (office phone), 803-898-3795 (fax) or by e-mail bishopma@columb32.dhec.state.sc.us.

Sincerely,

Michael A. Bishop, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC
Mihir Mehta, SCDHEC-BLWM
Paul Calligan, Tetra Tech NUS, 1401 Oven Park Dr., Suite 102, Tallahassee, FL 32312
Technical File



2600 Bull Street
Columbia, SC 29201-1708

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Larry R. Chewning, Jr., DMD

To: Keith Collinsworth
Federal Facility Liaison
Environmental Quality Control Administration

From: Paul L. Bristol *Paul Bristol*
Groundwater Quality Section
Bureau Of Water

Re: Finding of Suitability to Transfer dated 15 September 2000
Draft Environmental Baseline Survey for Transfer received 18 September 2000
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

The author has completed technical review of the referenced documents. As submitted, the documents provide a description of the physical and environmental condition of the subject property. Based on the information provided and data associated with previous environmental assessments conducted on the site, it appears that a reasonable and appropriate determination concerning site environmental conditions and associated risk (health and/or environment) has been developed for the subject property. Based on the above and with consideration to our meeting with Mr. Tony Hunt on 31 October 2000, provided the identified land and/or groundwater use restrictions are applied the subject property appears suitable for transfer as requested. Should you have any questions please contact me at 8.3559 or e-mail @bristolpl.

D H E C



PROMOTE PROTECT PROSPER

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Columbia, SC 29201-1708

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Larry R. Chewning, Jr., DMD

MEMORANDUM

DATE: November 13, 2001

TO: Michael Bishop
Groundwater Quality Section
Bureau of Water

FROM: Mary Peyton Davis *M.P.D.*
Air Modeling Section
Bureau of Air Quality

SUBJECT: Charleston Naval Base – Chicora Tank Farm, GWPD #13350
Charleston Naval Complex
Charleston, South Carolina

The Bureau of Air Quality has reviewed the air emission information for the vacuum extraction event to be located at CNB – Chicora Tank Farm in Charleston. Air dispersion modeling results indicate that the air toxic emitted (Naphthalene) will result in an off-site concentration of this toxic that will meet the air toxic standard (Standard No. 8). Since the total volatile organic compound (VOC) emissions are less than 1000 lbs./month, an air permit will not be required for the vacuum extraction event. If the 1000 lb. VOC limit is reached during the vacuum extraction event, the system will be shut down, and an air permit will be obtained from the Bureau of Air Quality before operation may continue. This is in accordance with Section II, Part F, Paragraph G of the SC Dept. of Health and Environmental Control Air Pollution Control Regulation No. 62.1.

cc: Bruce Hennessee, Trident EQC District
Angie Eastman, BAQ Permitting
Engineering File

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NOV 13 2001

Water Monitoring, Assessment &
Permitting Division

AIR DISPERSION MODELING SUMMARY SHEET

SITE NAME: CNB – Chicora Tank Farm

DATE: 11/13/01

LOCATION: Charleston Naval Complex

REVIEWED BY: MPD

GWPD NO.: 13350

MODEL: De minimis analysis

SOURCE DESCRIPTION: Vacuum extraction event

RESULTS:

POLLUTANT	CAS NO.	AVERAGING PERIOD	EMISSION RATE (lb/day)	DE MINIMIS LEVEL (lb/day)
Naphthalene	91-20-3	24 Hour	0.00226	15.000



**Water Monitoring, Assessment & Protection Division
Groundwater Quality Section**

Phone (803) 898-3553 Fax (803) 898-3795

Memo

To: Kevin Clark, Bureau of Air Quality
From: Michael Bishop, Hydrogeologist *MB*
Date: 11/1/2001
Re: CNB – Chicora Tank Farm DHEC ID # 13350, Free Product Recovery

Attached for your review and approval is the BAQ Modeling/ Air Toxic Questionnaire for the above referenced site submitted by Tetra Tech NUS on behalf of the Charleston Naval Base. Initial review by this Bureau indicates the Corrective Action activities are approvable.

Questions may be referred to my attention at (803) 898-3553.

Attach: Tetra Tech Air Data



TETRA TECH NUS, INC.

1401 Oven Park Drive • Suite 102 • Tallahassee, FL 32312
(850) 385-9899 • FAX (850) 385-9860 • www.tetrattech.com

August 10, 2001

Project Number 0174

Mr. Michael Bishop
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0174

Subject: Chicora Tank Farm
SCDHEC Site Identification # 13350
Charleston Naval Complex
Charleston, South Carolina

Dear Mr. Bishop:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, Tetra Tech, NUS, Inc. (TtNUS) is requesting approval to perform free product recovery activities at the referenced site. TtNUS will perform the free product recovery activities in accordance with applicable local, state and federal regulations.

Background

The Chicora Tank Farm was formerly used to store Bunker "C" Fuel, Navy Special Fuel, and Diesel Marine Fuel. All of the tanks at this location were removed in 1999 and the facility is no longer in use. During closure assessment activities, petroleum contamination was discovered along a fuel transfer pipeline while exposing a valve pit to clean the fuel transfer line. A Tank Closure Assessment Report and Rapid Assessment Report (RAR) were submitted and accepted by the South Carolina Department of Health and Environmental Controls (SCDHEC). The RAR recommended an Intrinsic Corrective Action Plan (CAP) for monitored natural attenuation of groundwater.

In May 2001 TtNUS personnel performed a baseline groundwater sampling event to provide baseline analytical data for preparation of the CAP. During the sampling event, free product was detected in monitoring wells CNCM-07 and CNCM-13.

Proposed Activities

The Navy has tasked TtNUS to perform free product recovery from two monitoring wells at the site on a bi-weekly basis. The free product recovery will continue until September 30, 2001, unless otherwise determined by the Government to be needed less frequently or for a shorter duration.

TtNUS will subcontract the services of a vacuum extraction truck and operator. Prior to each vacuum extraction event, TtNUS personnel will gauge the wells to monitor the thickness of free

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AUG 13 2001

**Water Monitoring, Assessment &
Protection Division**

Mr. Michael Bishop
SCDHEC
August 10, 2001 - Page 2

product and to evaluate the effectiveness of the recovery activities. At the conclusion of each event, TtNUS personnel will document the method of removal, the quantity removed, and method of disposal. Each event will be approximately two days in duration: one day to mobilize to the site and to gauge each well, and one day to oversee vacuum extraction activities and demobilize from the site. The first event is scheduled for the week of August 13, 2001. Three subsequent events will be conducted bi-weekly prior to September 30, 2001.

Due to the low yield of the monitoring wells at the Chicora Tank Farm, it is anticipated that the petroleum/water mixture will be extracted intermittently by periodically moving the vacuum extraction truck between the two wells. This will allow the groundwater in each well to recover while the other well is being vacuumed.

Air toxic emissions calculations have been prepared for each identified chemical of concern. Air dispersion modeling results suggest that the air toxics emitted will meet the SCDHEC Bureau of Air Quality Control (BAQC) Air Toxic Standards. A SCDHEC BAQC UST Modeling Information Sheet is attached along with the air toxic emissions calculations and a figure showing the monitoring well locations. No structures are located within a radius of five stack heights from the monitoring wells with free product. For verification, vacuum truck stack emissions will be monitored approximately ½ hour after the first event is started and approximately ½ hour prior to completion of the first event. A Sensidyne® sampling pump equipped with a General Hydrocarbon detection tube (No. 187S) will be used to perform the monitoring. This data will be used to verify that air toxic concentrations emitted meet the SCDHEC Air Toxic Standards. If air monitoring indicates that SCDHEC Air Toxic Standards may be exceeded, appropriate engineering controls will be implemented to reduce emissions.

At the conclusion of the final free product recovery event, a letter report will be prepared that includes the method of petroleum/water mixture removal, quantity of mixture removed, and method of disposal. One paper copy of the final report will be submitted to the SCDHEC, along with one paper copy and two CD copies to the Government.

If you have any questions regarding this initiative or require additional information, please contact me at (850) 385-9899.

Sincerely,



Paul E. Calligan, P.G.
Task Order Manager

Enclosures

c: Mr. Gabriel Magwood, SOUTH DIV
Debbie Wroblewski (Cover Letter Only)
Mark Perry (Unbound)

Attachments

Mobile Dual Phase Extraction System (MDES) Air Emission Calculations

- Assume the vacuum truck tank has a 800 gallon capacity.
- The operational time will continue until the tank truck is full (assumed 8 hours).
- The site contaminant is naphthalene (the only analyte to exceed regulatory criteria)
- The highest concentration of naphthalene detected at the site was 113 micrograms/liter (ug/l)

The US EPA guidance document "How to Evaluate Cleanup Technologies for Underground Storage Tank Sites" 1995, states:

Henry's law constant is the partition coefficient that relates the concentration of a constituent dissolved in water to its partial vapor pressure under equilibrium conditions. It describes the relative tendency for a dissolved constituent to exist in the vapor phase. Henry's law constant is a measure of the degree to which constituents will volatilize for physical removal by dual-phase extraction (DPE). Constituents with Henry's Law constants of greater than 100 atmospheres are considered sufficiently volatile to be physically removed with extracted vapor.

The Henry's Law constant for Naphthalene is 72 atmospheres. Therefore, it is assumed that naphthalene is not volatile enough to be physically removed with the extracted vapors and that emissions will result as free product and groundwater are extracted and deposited in the vacuum truck tank.

Past MDES events indicate that free product concentrations are removed in the initial 15 to 30 minutes of operation, and the subsequent 7.5 hours, only groundwater and vapor are extracted from the wells. Additionally, the concentration of dissolved phase hydrocarbons is expected to decrease as the operational time increases. To account for the free product and for a conservative estimate, the highest concentration of naphthalene detected at the site will be used in mass estimates for the entire duration of the MDES event. Additionally, it will be assumed that all naphthalene extracted from groundwater will be emitted into the air.

Therefore:

When full, the tanker truck will hold 800 gallons or 3028 liters.

The highest detected concentration of naphthalene at the site was 113 ug/l.

$113 \text{ ug/l} \times 3028 \text{ liters} = 324,164 \text{ ug of Naphthalene or } 0.342164 \text{ grams of Naphthalene}$

If all naphthalene volatilizes and is emitted to the air the total air emissions would be:

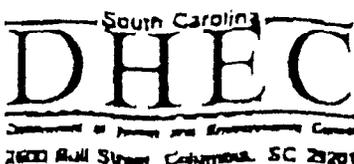
0.342164 grams

or

0.007545 pounds

Therefore:

$0.0007545 \text{ pounds} / 8 \text{ hours} = 0.0000943 \text{ pound/hour}$



Commissioner: Michael D. Jarnen
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 Richard E. Jansour, DDS, Secretary
 Planning Board, Planning for Environment

Tony Graham, Jr., MD
 Sandra J. Mosander
 John S. Pate, MD
 Robert J. Singing, Jr.

BAQC USE MODELING INFORMATION

PLEASE FILL OUT SEPARATELY

SITE/COMPANY NAME: Charleston Naval Complex, US Navy GWP ID#: _____
 CLEANUP LOCATION: Site 42, Chicora Tank Farm
North Charleston, South Carolina
 TYPE OF OPERATION (i.e. ADR STRIPPER): Mobile Dual Phase Extraction (MDES)
 CONTACT: Paul Callican PHONE: (813) 806-0202

SITE MAPS

Please include a scaled plot plan of the site location that clearly shows distances from the stack to the property boundaries. All buildings and/or structures within a radius of 5 stack heights (measured from the stack/vent) shall be incorporated on this plot plan and information on each building and/or structure's height, width, and length shall also be included.

STACK INFORMATION

HEIGHT ABOVE GROUND 9 FEET; DIAMETER 0.4 FEET
 TEMPERATURE 120 F; VELOCITY 8.3 FEET/SECOND

AIR TOXIC INFORMATION

AIR TOXIC EMITTED (i.e. BENZENE)	CHEMICAL ABSTRACT SERVICE (CAS) NUMBER	EMISSION RATE LB/HR
A) <u>Naphthalene</u>	<u>91-20-3</u>	<u>0.000943</u>
B) _____	_____	_____
C) _____	_____	_____
D) _____	_____	_____
E) _____	_____	_____

Please submit this completed sheet with scaled site maps to the appropriate SCDHEC project manager at the Ground-Water Protection Division, 2600 Bull Street, Columbia, SC 29201.



1 November 2001

2600 Bull Street
Columbia, SC 29201-1708

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Commander
NAVFACENGC COM Southern Division
Attn: Code ES24 (Gabriel Magwood)
P.O. Box 190010
North Charleston, SC 29419-9010

Re: CNB - Chicora Tank Farm
Site Identification # 13350
Monitoring Well Installation Request received 29 October 2001
Charleston County

Dear Mr. Magwood:

The Department has reviewed your request to install additional sampling points at this location. Installation and sampling activities are approved for immediate implementation; a monitoring well installation permit is enclosed. Please note that all monitoring wells must be installed and/or abandoned in accordance with South Carolina Well Standards and Regulations R. 61-71.

Upon completion of site activities, please provide the Department with a report detailing the installation activities and the results of the groundwater sampling event.

Should you have any questions please contact me at (803) 898-3553 (office phone), (803) 898-3795 (fax) or by e-mail bishopma@columb32.dhec.state.sc.us. Please reference Site ID # 13350 on all future correspondence.

Sincerely,

Michael A. Bishop, Hydrogeologist
Groundwater Quality Section
Bureau of Water

Enc: MWA

cc: Trident District EQC (w/enc)
Technical File (w/enc)
Paul Bergstrand, SCDHEC-BLWM (w/enc)
Paul Calligan, P.G., TTNUS, 1401 Oven Park Dr., Suite 102, Tallahassee, FL 32312 (w/enc)

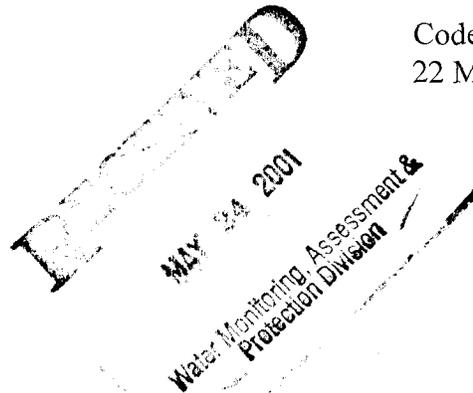


DEPARTMENT OF THE NAVY

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

Code 1849
22 May 2001

SCDHEC
Groundwater Quality Section
Bureau of Water
Attn: Mr. Paul Bristol
2600 Bull Street
Columbia, SC 29201



Subj: FREE PRODUCT DISCOVERY DURING SAMPLING AT CHICORA TANK FARM (Site ID # 13350)

Dear Mr. Bishop:

During groundwater sampling at the Chicora Tank Farm on May 7, 2001, free product was discovered in wells MW-7 and MW-13. The sampling event was done to demonstrate the groundwater environment's capacity to provide for intrinsic remediation as the rehabilitation strategy.

MW-7 is located along the supply header piping adjacent to former Tank 3906-M. This area was over-excavated and free product removed from the pit during the cleaning and closure of Tank M. The excavated soil and free product was disposed of off-site. MW-7 is considered to be the source well for the contaminated area around Tank M. Due to the viscosity of the free product, the Navy was unable to measure the product's thickness at that time. MW-12D, the adjacent deep well has no free product.

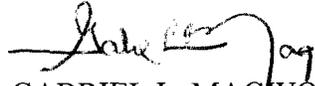
MW-13 is located along the sludge oil pipeline that connects Tank 3906-O to the sludge line header piping. This area was over-excavated and free product removed from the pit during the cleaning and closure of Tank O. The excavated soil and free product was disposed of off-site. MW-13 is considered to be the source well for the contaminated area around Tank O. Due to the viscosity of the free product, the Navy was unable to measure the product's thickness at that time. The adjacent deep well, MW-18D, has no product.

After the analytical results have been received and evaluated, an active CAP will be developed to remediate the contamination. The Navy is currently seeking FY 01 funds to address the free product, and will seek FY 02 funding to address the findings of the CAP.

The Navy's initial plan is to use a vacuum truck to periodically extract free product and vapors from wells MW-7 and MW-13.

If you have any questions or concerns, please contact me at (843) 820-7307 or by Email at magwoodgl@efdsouth.navy.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "Gabriel L. Magwood". The signature is fluid and cursive, with a large loop at the end.

GABRIEL L. MAGWOOD
Environmental Engineer
Petroleum Branch



2600 Bull Street
Columbia, SC 29201-1708

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Rodney L. Grandy

Larry R. Chewning, Jr., DMD

To: Keith Collinworth
Federal Facility Liaison
Environmental Quality Control Administration

From: Paul L. Bristol *Paul Bristol*
Groundwater Quality Section
Bureau Of Water

Re: Finding of Suitability to Transfer dated 15 September 2000
Draft Environmental Baseline Survey for Transfer received 18 September 2000
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

The author has completed technical review of the referenced documents. As submitted, the documents provide a description of the physical and environmental condition of the subject property. Based on the information provided and data associated with previous environmental assessments conducted on the site, it appears that a reasonable and appropriate determination concerning site environmental conditions and associated risk (health and/or environment) has been developed for the subject property. Based on the above and with consideration to our meeting with Mr. Tony Hunt on 31 October 2000, provided the identified land and/or groundwater use restrictions are applied the subject property appears suitable for transfer as requested. Should you have any questions please contact me at 8.3559 or e-mail @bristolpl.

1272



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TTNUS/TPA-01-001/4015-4.1

October 26, 2001

Project Number 4015

Mr. Michael Bishop
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0174

Subject: Chicora Tank Farm
SCDHEC Site Identification # 13350
Charleston Naval Complex
Charleston, South Carolina

Dear Mr. Bishop:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, Tetra Tech, NUS, Inc. (TtNUS) is requesting approval to install and sample additional monitoring wells at the referenced site.

Background

The Chicora Tank Farm was formerly used to store Bunker "C" Fuel, Navy Special Fuel, and Diesel Marine Fuel. All of the tanks at this location were removed in 1999 and the facility is no longer in use. During closure assessment activities, petroleum contamination was discovered along a fuel transfer pipeline while exposing a valve pit to clean the fuel transfer line. A Tank Closure Assessment Report and Rapid Assessment Report (RAR) were submitted and accepted by the South Carolina Department of Health and Environmental Controls (SCDHEC). The RAR recommended an Intrinsic Corrective Action Plan (CAP) for monitored natural attenuation of groundwater.

In May 2001 TtNUS personnel performed a baseline groundwater sampling event to provide baseline analytical data for preparation of the CAP. The laboratory analytical results from the baseline sampling event indicated that the naphthalene concentration in samples collected from monitoring wells MW2 and MW-7 exceeded the RBSL (see Figure 1). This indicates that the downgradient and lateral extent of the dissolved hydrocarbon plume is no longer delineated in the areas of Tank L and Tank M. Based on this, TtNUS recommends the installation of three additional shallow monitoring wells.

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OCT 29 2001

Water Monitoring, Assessment &
Protection Division

Proposed Activities

The proposed activities will involve the installation and sampling of three additional monitoring wells. One well will be installed approximately 60 feet east of monitoring well MW-2. One well will be installed approximately 60 feet northeast of monitoring well MW-11. And one well will be installed approximately 60 feet southeast of monitoring well MW-10. The proposed well locations are depicted on the Figure 2. All three wells will be completed to a depth of approximately 15 feet below land surface with 10 feet of 0.010-inch machine slotted screen. Subsequent to installation and development of the monitoring wells, groundwater samples will be collected for laboratory analysis for BTEX, methyl tert butyl ether (MTBE), and naphthalene by EPA Method 8260B; and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270B. The monitoring well installation and sampling activities will be performed in accordance with the sampling procedures and methods described in Section 4.0 of the TtNUS Site Assessment Plan for CNC Zone I, previously submitted to the SCDHEC in May 1999.

If you have any questions regarding this initiative or require additional information, please contact me at (850) 385-9899.

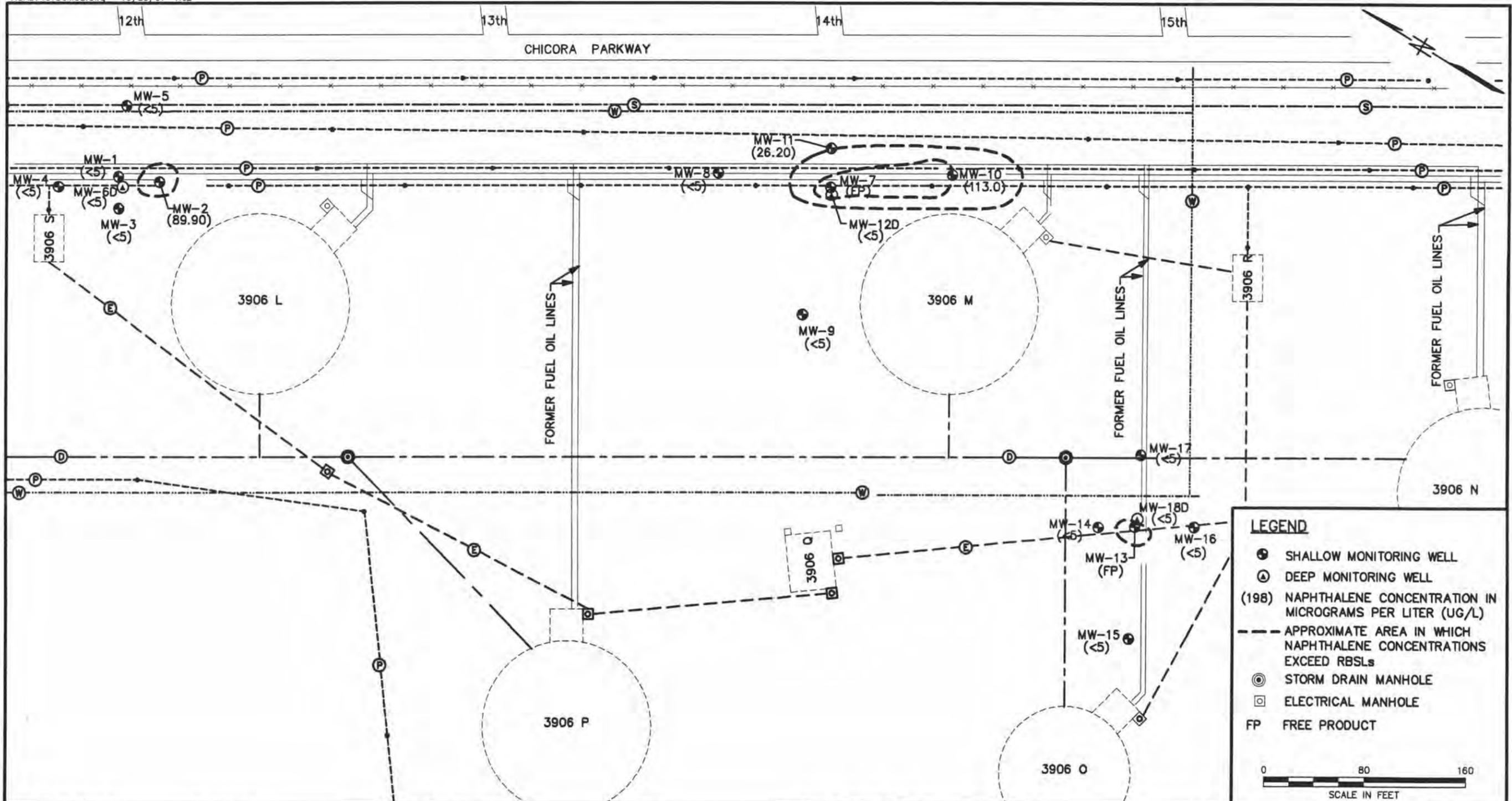
Sincerely,



Paul E. Calligan, P.G.
Task Order Manager

Enclosures

c: Mr. Gabriel Magwood, SOUTH DIV
Debbie Wroblewski (Cover Letter Only)
Mark Perry (Unbound)



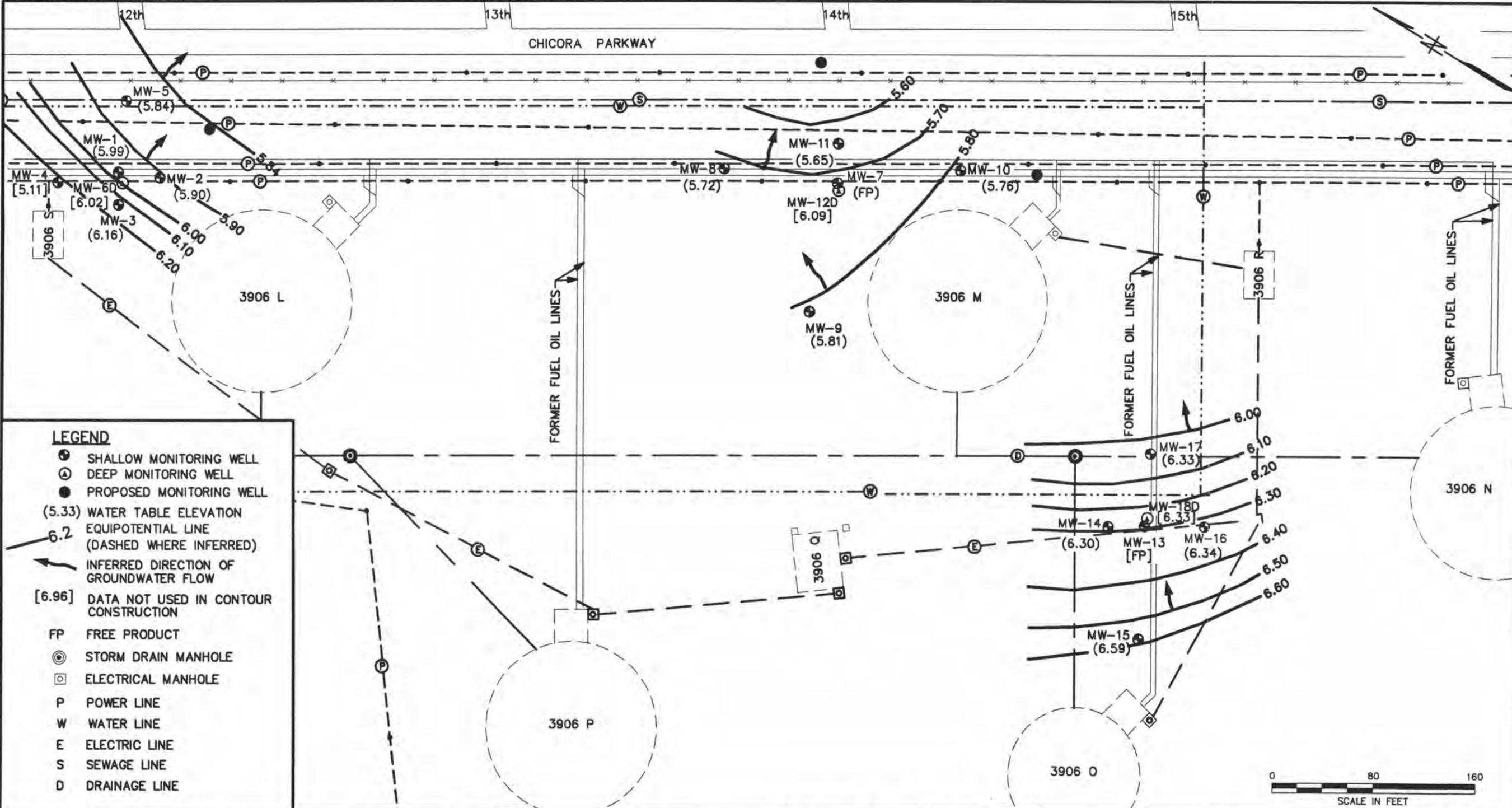
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY: HJP DATE: 7/15/01
 CHECKED BY: DATE:
 COST/SCHED-AREA:
 SCALE: AS NOTED



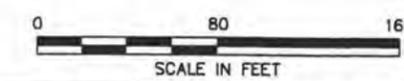
GROUNDWATER NAPHTHALENE MAP
 CHICORA TANK FARM - SITE 42
 CHARLESTON NAVAL SHIPYARD
 CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 4015	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV. 0



LEGEND

- SHALLOW MONITORING WELL
- ⊙ DEEP MONITORING WELL
- PROPOSED MONITORING WELL
- (5.33) WATER TABLE ELEVATION
- EQUIPOTENTIAL LINE (DASHED WHERE INFERRED)
- ← INFERRED DIRECTION OF GROUNDWATER FLOW
- [6.96] DATA NOT USED IN CONTOUR CONSTRUCTION
- FP FREE PRODUCT
- ⊙ STORM DRAIN MANHOLE
- ⊠ ELECTRICAL MANHOLE
- P POWER LINE
- W WATER LINE
- E ELECTRIC LINE
- S SEWAGE LINE
- D DRAINAGE LINE



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 7/13/01
 CHECKED BY DATE
 COST/SCHED-AREA
 SCALE AS NOTED



GROUNDWATER POTENTIOMETRIC MAP AND PROPOSED MONITORING WELL LOCATIONS
 SEPTEMBER 12, 1999
 CHICORA TANK FARM - SITE 42
 CHARLESTON NAVAL SHIPYARD
 CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 4015	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV. 0



28 January 2000

2600 Bull Street
Columbia, SC 29201-1708

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Secretary

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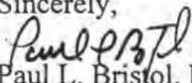
Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

Re: Completion Report-Demolition Tank "K, L, M, N, O" dated 23 December 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides a narrative describing demolition activities employed to deconstruct Fuel Storage Tank "K, L, M, N, O" at Chicora Tank Farm. Based on the information presented, it appears the employed activities were conducted in accordance with the approved Work Plan dated 6 July 1998. In this regard, the author has no further comments concerning Tank "K, L, M, N, O" at this time.

Should you have any questions please contact me at (803) 898-3559.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



28 January 2000

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

Department of the Navy
Southern Division NFEC

BOARD:
Bradford W. Wyche
Chairman

P.O. Box 190010
North Charleston, SC 29419-9010

William M. Hull, Jr., MD
Vice Chairman

Attention: Mr. Gabriel Magwood

Mark B. Kent
Secretary

Howard L. Brilliant, MD

Brian K. Smith

Rodney L. Grandy

Larry R. Chewning, Jr., DMD

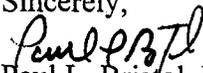
Re: Completion Report-Demolition Tank "K, L, M, N, O" dated 23 December 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

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Should you have any questions please contact me at (803) 898-3559.

Sincerely,


Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



7 December 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

Department of the Navy
Southern Division NFEC

BOARD:
John H. Burriss
Chairman

P.O. Box 190010
North Charleston, SC 29419-9010

William M. Hull, Jr., MD
Vice Chairman

Attention: Mr. Gabriel Magwood

Roger Leaks, Jr.
Secretary

Re: Final Assessment Report dated 28 October 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the CAP (corrective action plan) provides a narrative and summary of interim remedial actions (soils removal) and assessment activities conducted to investigate media (including soil and groundwater) contaminated with petroleum hydrocarbons at the subject site. The analytical results presented and applied interpretations appear to indicate that a reasonable delineation and characterization of the extent and severity of soil and groundwater contamination have been developed for the Chicora Tank Farm site. This information and data were then utilized in evidential discussion(s) for consideration of employing monitored intrinsic remediation (natural attenuation/biodegradation) as the rehabilitation strategy for the referenced site.

Although the author concurs with the proposed remedial strategy, proposals that incorporate monitored natural attenuation must provide sufficient data to demonstrate the groundwater environment's assimilative capacity to provide for intrinsic biodegradation/natural attenuation for the known contaminants through time. Appropriate and reasonable data must be available/developed to demonstrate contaminant plume stability, contaminant stoichiometry and provide site specific information/data on attenuation (retardation and degradation) rates to verify predictive modeling applied to the site. Associated routine monitoring (groundwater and soil, as necessary) should be sufficient to demonstrate the rate and effectiveness (if any) of predicted degradation processes in effect and able to distinguish the effects of nondestructive processes (advection, dispersion, sorption, etc.) and destructive attenuation processes.

Based on the above review and comments, the facility should develop an appropriate CAP

46.28.99
46.28.99



TETRA TECH NUS, INC.

1311 Executive Center Drive, Ellis Building. ■ Suite 220 ■ Tallahassee, FL 32031
(850) 656-5458 ■ FAX (850) 656-7403 ■ www.tetrattech.com

TTNUS/TAL-99-036/0105-3.2

23 June, 1999

Project Number 0105

Mr. Paul Bristol
South Carolina Department of Health and Environmental Control
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

RECEIVED

JUN 24 1999

Water Monitoring, Assessment &
Protection Division

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0105

Subject: Rapid Assessment Plan for
Chicora Tank Farm
Charleston Naval Complex
Charleston, South Carolina

Dear Mr. Bristol:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, Tetra Tech NUS, Inc. (TtNUS) is pleased to submit for your review and approval, the enclosed Rapid Assessment Plan for the Chicora Tank Farm at the Charleston Naval Complex.

As per our previous discussions, TtNUS will perform the site investigation activities at the Chicora Tank Farm in accordance with the procedures and methods described in the Site Assessment Plan - CNC Zone I, dated May 1999.

If you have any questions regarding this plan or require additional information, please contact me at (850) 385-9899.

Very truly yours,

Paul E. Calligan, P.G.
Task Order Manager

/pc

Enclosures (1)

c: Mr. Gabriel Magwood, SOUTHDIV
Ms. D. Wroblewski/DER (w/o enclosure)
Mr. M. Perry/File

**Rapid Assessment Plan
Chicora Tank Farm**



**Rapid Assessment Plan
Division of Underground Storage Tank Management**

Facility ID #: N/A County: CHARLESTON Facility Name: CNC, CHICORA TANK FARM

Facility Address: CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM

Responsible Party: U.S. NAVY Address: 2155 EAGLE DR., N. CHARLESTON, SC

No. USTs: 6 ASTs Removed? REMOVAL IN PROGRESS Replaced? N/A
(date) (date)

Current use of facility/property: CHARLESTON NAVAL COMPLEX

Current property owner name: U.S. NAVY

Current property owner address: 2155 EAGLE DRIVE, N. CHARLESTON, SC 29406

Field Screening Methodology

Specify the field screening methodology to be used. The use of field screening methods to optimize the number and location of permanent wells is required.

DIRECT PUSH TESTING WILL BE USED TO INSTALL MONITORING POINTS. SOIL AND GROUNDWATER
SAMPLES WILL COLLECTED FROM EACH POINT FOR SCREENING BY A MOBILE LABORATORY. THE MOBILE
LABORATORY WILL SCREEN THE SAMPLES FOR BTEX, NAPHTHALENE AND DIESEL RANGE ORGANICS (DRO).
SOIL SAMPLES WILL ALSO BE SCREENED WITH AN ORGANIC VAPOR ANALYZER TO ASSESS THE VADOSE
ZONE SOILS FOR PETROLEUM VAPORS

Permanent Monitoring Wells (estimate number and total completed depth)

of shallow wells: 10 Total depth: 20 FEET

of deep wells: 2 Total depth: 40 FEET (if necessary)

Comments, if warranted: _____

Analyses

List the analytical parameters (e.g., BTEX, MTBE) and estimated number.

GROUNDWATER: BTEX	12	SOIL: BTEX	14
NAPHTHALENE	12	NAPHTHALENE	14
MTBE	12	PAH	14
PAH	12	TPH	2
EDB	12	TOC/FOC	2
LEAD	12	GRAIN SIZE	2

Implementation Schedule

EDB 14
LEAD 14

Start up date: _____ Completion date: _____

Report submittal date: _____

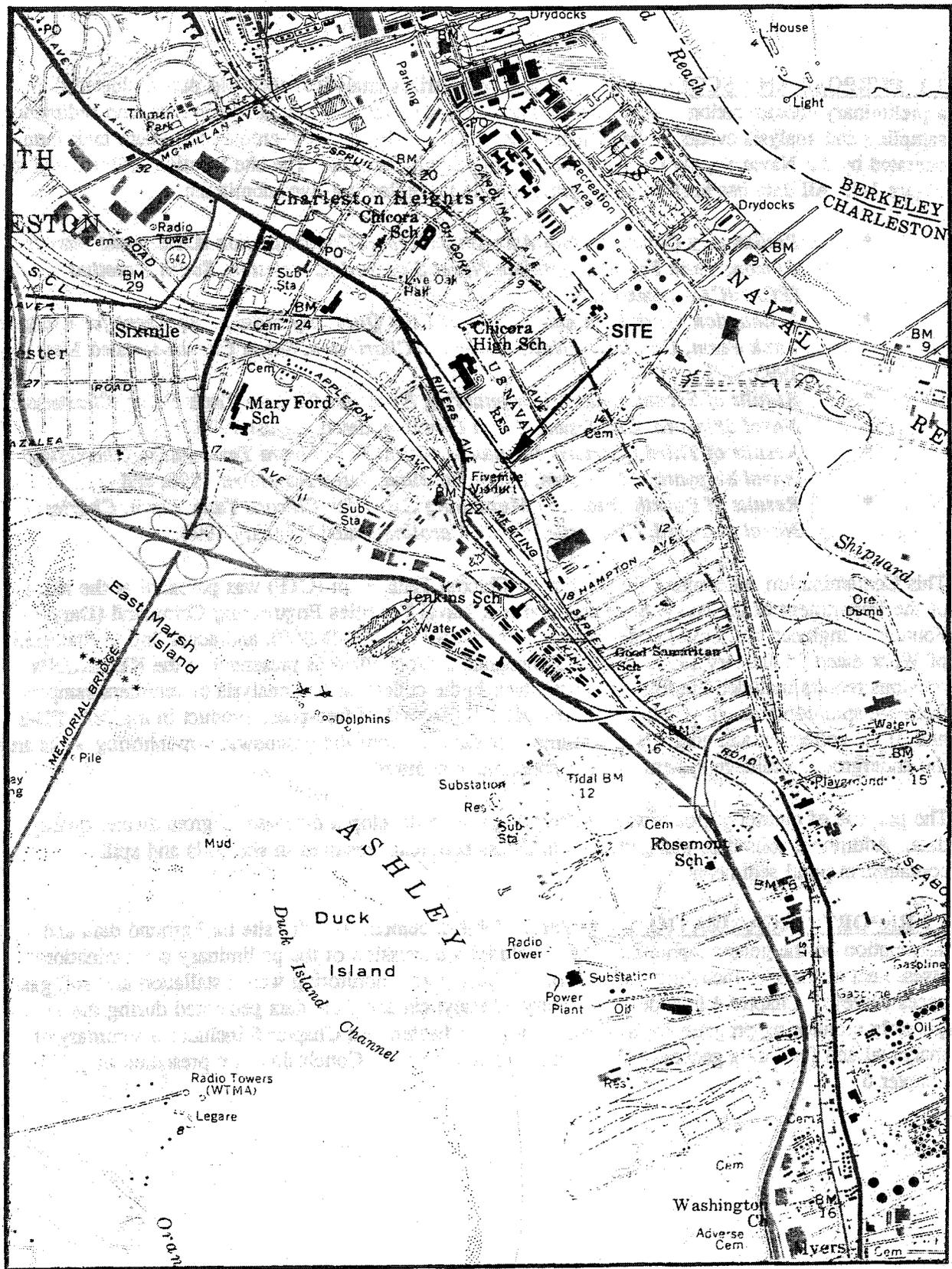
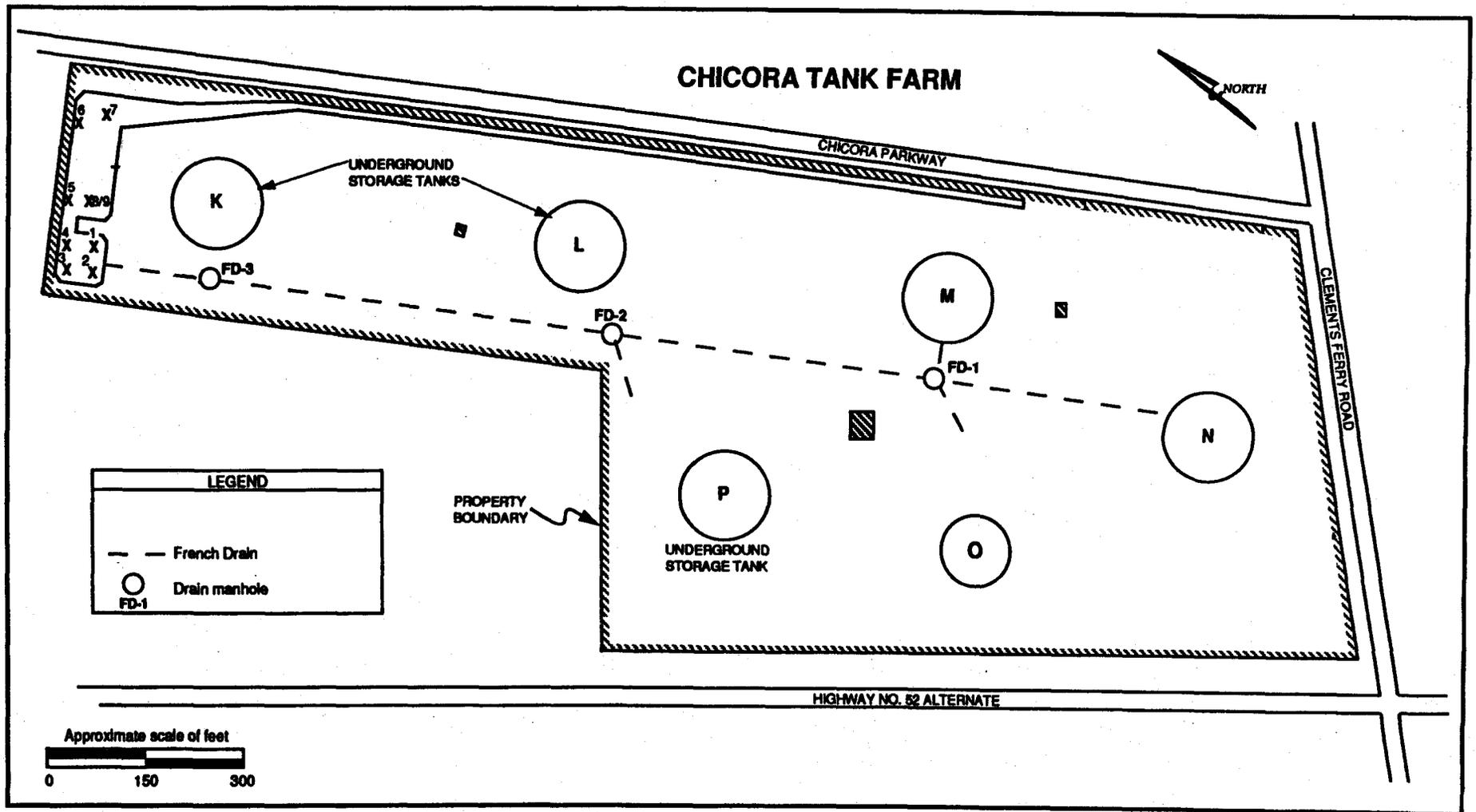


Figure 1-1. Vicinity Map Scale 1:24000
7.5 Minute USGS Charleston, SC Quadrangle.





2600 Bull Street
Columbia, SC 29201-1708

October 13, 2000

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OCT 16 2000

Mr. Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

**Water Monitoring, Assessment &
Protection Division**

RE: Finding of Suitability to Transfer (FOST) for the Chicora Tank Farm and
Environmental Baseline Survey for Transfer (EBST), dated September 15,
2000

Dear Mr. Allison,

The South Carolina Department of Health and Environmental Control (DHEC) has completed its review of the above referenced document according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated from the RCRA Permitting program based on this review. Additional comments may be forthcoming from the Underground Storage Tank (UST) program under separate cover. The attached comments must be addressed before final approval/concurrence can be given for the above referenced document. DHEC will gladly participate in any meetings necessary to facilitate the approval of the referenced document. If you should have any questions, please contact Mihir Mehta at (803) 896-4088 or myself at (803) 898-3973.

Sincerely,

Keith Collinsworth, P.G.
Federal Facility Liaison
Environmental Quality Control

Cc: Mihir Mehta, BLWM
Paul Bergstrand, BLWM
Rick Richter, Trident EQC
Paul Bristol, BOW
Tony Hunt, Navy Southern Division
Dann Spariosu, EPA Region IV
Robert Ryan, South Carolina Redevelopment Authority (RDA)
Dean Williamson, CH2M Hill

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 10 October 2000

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Draft Finding of Suitability to Transfer (FOST)
Draft Environmental Baseline Survey for Transfer (EBST) Report
Chicora Tank Farm
Dated September 2000, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996, the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994, CERFA 120(h) as amended, DoD Guidance and EPA BRAC Guidance.

The document as submitted does not support the request for "Finding of Suitability to Transfer". Comments on the Draft EBSL Report and Draft FOST are provided. The Department is willing to discuss these comments to move the review and approval process forward.

Draft FOST Comments

Paul M. Bergstrand

10 October 2000

1. **Section 1.0 Purpose**

This section states that the property is “environmentally suitable for transfer...” The document should be revised to state that the property is “environmentally suitable for transfer with the conditions of groundwater use restrictions to be incorporated into the deed(s) ...”

2. **Section 2.0 Description of Property**

This section should include and identify the AOCs and the status of the AOCs as stated in the CNC RCRA Permit on the property intended for transfer.

3. **Section 2.0 Past Use and Proposed Reuse**

This section does not include a description of land use prior to the Navy acquiring the land or during the time the Navy utilized the land. The document should be revised to include the appropriate historical information.

4. **3.0.B Storage Tanks and Petroleum Contamination**

This subsection, within the section titled “Environmental Findings”, does not include a description of petroleum contamination present on the subject property. The document should be revised to reference the appropriate information.

5. **5.0 Requirements Applicable to Property Transfer**

The Charleston Naval Complex holds a RCRA Hazardous Waste Permit. This section does not include the RCRA requirements. The document should be revised to include the appropriate information.

6. **5.0 E. Land and/or Groundwater Restrictions**

This section states that “use restrictions will be incorporated into the deed(s) and/or transfer agreement, which shall effect the transfer of the subject property.” The document does not describe how such restrictions will be enforced, monitored or rescinded. The document should be revised to include the appropriate information.

7. **5.0 E. Land and/or Groundwater Restrictions**

The last sentence of the first bullet in this section is not complete. Please revise.

Draft EBST Report Comments

Paul M. Bergstrand

10 October 2000

1 **Permit Issue**

The Department has noted that AOC 646 is listed in the Permit as "CSI Required". In order for the Navy to transfer the property without permit restrictions the permit must be modified to change the status of AOC 646 to the appropriate current status.

2. **Page 1-2; Figure 1**

This figure should include the adjacent properties that are described in Section 6.0.

3. **Page 1-4; Table 1**

This table should include or identify the AOCs as described in Section 5.0.

4. **Page 2-2; Section 2.1.8**

This section states the document will "identify all hazardous substances/petroleum products stored for one year or more, released, or disposed on the subject property." This information should result in a list or table of hazardous substances stored for one year or more, released or disposed in this document. Please note, this is not the same topic as is addressed in Section 5.2. The revised document should provide this information.

5. **Page 2-3; Section 2.1.10**

This section states that the document will review and ascertain if there has been a release of any hazardous substance or petroleum product or its derivatives which may migrate to the subject property. There should be a list or table in this document of hazardous substances or petroleum products which have potential to migrate on the property. The revised document should provide this information

6. Page 2-3; **Section 2.1.11**

This section states that current and former employees will be interviewed. There is no evidence in this document that this interview has or has not occurred. A table or list of interviewed employees should be provided in the revised document.

7. Page 4-2; **Section 4.3**

This section is titled Hydrogology. The discussion however is directed to the Charleston Naval Complex and not specific to the Chicora Tank Farm. Chicora Tank Farm specific information, such as groundwater flow and discharge to surface water bodies, should be provided in the revised document.

8. Page 6-1; **Section 6.0, Finding for Adjacent Property**

This section is to provide a summary of the status of properties surrounding the Chicora Tank Farm. This section only provides a generalized written description of the properties location to the Chicora Tank Farm. A current map showing the surrounding properties should be provided in the revised document.

Furthermore, Section 2.1.10 of this document states that the document will review and ascertain if there has been a release of any hazardous substance or petroleum product, or its derivatives, which may migrate to the subject property. Section 6.0 would be the ideal location to provide a list or table of hazardous substances or petroleum products which may migrate on the property. Such a table or list should be provided in the revised document as is appropriate.

9. Page 7-1; **Section 7.0, Conclusions**

This section presents contradictory statements on the classification of property. Section 7.1 states the Chicora Tank Farm has been categorized as 2 – Blue, *Areas where on release or disposal of petroleum products has occurred*. Section 7.4 states the property is 3 – Light Green, *Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response*. Please note, the Department has not been involved with nor approved the Navy's classification

system.

Furthermore, based on this document both of the classifications 2 – Blue and 3 – Light Green appear to be incorrect. Section 7.2 (Recommended Use Restrictions) states that “Restrictions will be placed on the use of groundwater on the site until monitoring indicates that petroleum contamination (naphthalene) is below risk based corrective action levels as established by SCDHEC for residential use”. This restriction indicates the property should be classified as 5 – Yellow *Areas where release, disposal, and/or migration of hazardous substances has occurred, removal and/or remedial actions are underway, but all required remedial action have not yet been taken.* Properties in category 5 – Yellow may be considered for transfer upon concurrence with the SCDHEC and USEPA in accordance with CERCLA 120(h)(3)(C). The document should be revised to reflect the condition of property.

10. **Page 7-1; Section 7.2, Recommended Use Restrictions**

This section states that “Restrictions will be placed on the use of groundwater on the site until monitoring indicates that petroleum contamination (naphthalene) is below risk based corrective action levels as established by SCDHEC for residential use.” The document, however, does not provide any details of the Land Use Restrictions. The document should be revised to include these details.

11. **Appendix D, Waiver of Construction, Demolition and Debris Requirements**

This appendix included select correspondence from DHEC. In particular, no further action correspondence, dated May 17, 1994; tanks K, L, M, N, & O demolition completion reports correspondence dated 28 January 2000; tank P demolition completion report correspondence dated 11 May 1999, tanks K, L, M, N, & O demolition on site waiver form dated April 1, 1999; tanks K, L, M, N, & O cleaning work plan dated 20 August 1998, tank P cleaning work plan dated 30 July 1998 and, the tank P demolition on site waiver form dated April 1, 1999. This appendix should include all other significant documents such as the DHEC correspondence related to the *Completion Report for UST CTF-3, Removal and Assessment Report (EEG, November 1999)* and the *Rapid Assessment Report for Site 42, Chicora Tank Farm, October 1999 (Tetra Tech)*.



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

Li 6.21.99
LO 6.23.99

5090
Code 1849
14 Jun 99

South Carolina Department of Health
And Environmental Control
Attn: Mr. Paul Bristol
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia SC 29201

WELL ABANDONMENT AT CHICORA TANK FARM

Dear Mr. Bristol:

The following, Figure 1, displays the location of the wells that were abandoned at the Chicora Tank Farm, Charleston Naval Complex, Charleston, SC. The wells were abandoned in accordance with South Carolina Well Standards and Regulations R. 61-71.

If you have any questions please contact me at (843) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Remedial Project Manager

Encl:
(1) Well abandonment location.

RECEIVED

JUN 17 1999

**Water Monitoring, Assessment &
Protection Division**



DEPARTMENT OF THE NAVY
SUPERVISOR OF SHIPBUILDING, CONVERSION AND REPAIR, USN
PORTSMOUTH, VIRGINIA, ENVIRONMENTAL DETACHMENT CHARLESTON
1898 NORTH HOBSON AVENUE, BUILDING 30
NORTH CHARLESTON, SOUTH CAROLINA 29405-2106

IN REPLY REFER TO:

Ser. 319

APR 19 1999

MEMORANDUM

From: Director, Supervisor of Shipbuilding, Conversion and Repair, USN Portsmouth Va., Environmental Detachment, Charleston, SC (SPORTENVDETCNASN)

To: Southern Division Naval Facilities Engineering Command
(Code 1849 Gabe Magwood)

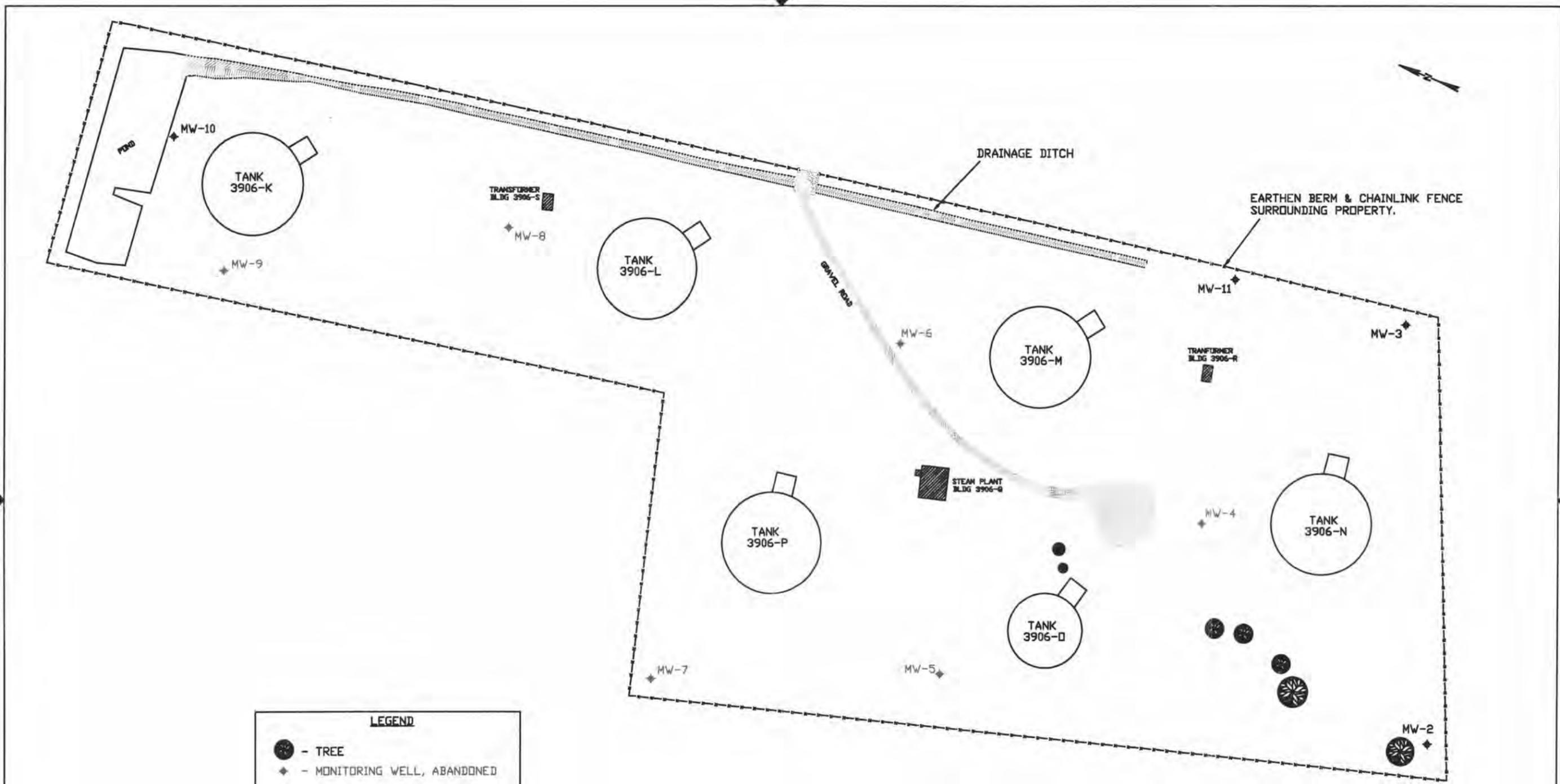
Subj: MONITORING WELLS AT CHICORA TANK FARM ARE ABANDONED

Ref: (a) South Carolina Department of Health and Environmental Control letter dated March 30, 1999 "Approval for abandonment of monitoring wells MW-4,5,6,7,8, and 9 at Chicora Tank Farm".

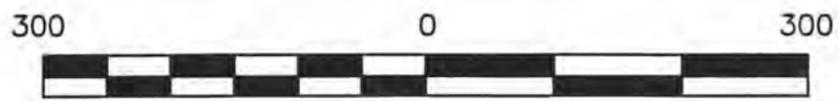
1. The purpose of this memo is to inform you that wells MW-4, 5, 6, 7, 8, and 9 per reference (a) were abandoned at Chicora Tank Farm (Site Identification # 13350) on April 8, 1999 in accordance with South Carolina Well Standards and Regulations R. 61-71. Figure 1 identifies the specific well locations and site layout. This was accomplished by removing the 2-inch PVC well casing and filling the hole from the bottom to the top with cement grout. A 2'x 2' concrete pad was formed at the top just below ground surface.
2. If you have any questions concerning this matter please contact Tommy Hardin at (843)743-6306 ext. 222.

Respectively,

E.R. Dearhart



LEGEND	
●	- TREE
◆	- MONITORING WELL, ABANDONED
◆	- MONITORING WELL, INTACT



GRAPHIC SCALE



ENVIRONMENTAL DETACHMENT CHARLESTON 1899 NORTH HOBSON AVENUE - BUILDING 30 NORTH CHARLESTON, SOUTH CAROLINA 29405-2106			
FIGURE 1: MONITORING WELL ABANDONMENT CHICORA TANK FARM N. CHARLESTON, SC			
SIZE B	DATE 4-15-99	PREPARED BY L. C. DIASIO	REV -
SCALE AS INDICATED	CHECKED BY T. HARDIN	DWG NO: CTF_WELL_ABAN1	



23 June 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
Vice Chairman

Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

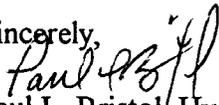
Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

Re: Monitoring Well Abandonment Report dated 14 June 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. The submitted report documents the proper abandonment of monitoring wells MW-4, MW-5, MW-6, MW-7, MW-8, MW-9 at the subject site. No additional information is requested at this time.

Should you have any questions please contact me at (803) 898-3559.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



28 June 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
John H. Burriss
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William M. Hull, Jr., MD
Vice Chairman

Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

Re: Site Assessment Plan dated 23 June 1999
Chicora Tank Farm (Site Identification # 13350)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the SAP (site assessment plan) provides for additional investigative endeavors to determine the extent and severity of soil and groundwater contamination, if any, at the subject site. It is recognized that the initial tasks (i.e., soil borings, piezometers, etc.) are generically designed to allow for field modifications/adjustments, as necessary. Based on the above review, the proposal to perform soil borings, piezometer installation (Phase I) and monitoring well installation (Phase II) and appropriate sampling is approved for implementation.

Permanent monitoring well installation (Phase II), with the exception(s) noted below, will be conducted after appropriate consultation with the Department concerning Phase I analytical results.

The facility may use best professional judgement to install additional temporary monitoring points to define the extent and severity of free phase petroleum product and/or significant dissolved phase contamination if identified during Phase I field activities. Temporary monitoring wells may be converted to permanent wells at the time of installation in the presence of free phase petroleum product, as appropriate.

Please find enclosed monitoring well approval # 0506 for the proposed piezometers, soil borings and monitoring wells. Abandonment of all intrusive sampling points will be in accordance with the technical specifications and descriptions provided and/or referenced in the SAP or as approved by the Department.

Please be reminded that the Department retains the authority to request additional assessments



Date of Issue: 28 June 1999
Approval No: 0506

2600 Bull Street
Columbia, SC 29201-1708

Monitoring Well Installation Approval

COMMISSIONER:
Douglas E. Bryant

Approval is hereby granted to: Charleston Naval Complex/Charleston Naval Base
(on behalf of): Chicora Tank Farm
Site ID#: 13350
County: Charleston

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
Vice Chairman

Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

This approval is for the construction of DPT (direct push technology) piezometers and monitoring wells (number to be field determined) in accordance with the construction plans and technical specifications submitted to the Department on 19 May 1999. The piezometers and monitoring wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well be submitted to within thirty (30) days of completion (of last well(s) installed).
(to be submitted with Assessment Report)
2. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
3. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Trident District EQC Office (843-740-1590).
4. Please provide groundwater quality analytical data (chemical analyses and/or water level(s)) and associated measurements (i.e., field measurements) to Paul L. Bristol within thirty (30) days of receipt from laboratory.
(to be submitted with Assessment Report)
5. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
6. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification number.
(for permanent wells, only)

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by:

Paul L. Bristol, P.G.
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



20 August 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
Vice Chairman

Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

Re: Preliminary Mobile Laboratory Results received 19 August 1999
Chicora Tank Farm (Site Identification # 13350)
Zone G/Site 42
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the preliminary results are presented as justification for locating permanent monitoring wells at the subject site. Based on the information presented the monitoring wells are approved for installation. Please find enclosed monitoring well approval # 0564 for the proposed monitoring wells.

Should you have any questions please contact me at (803) 898-3559.

Sincerely,


Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

enc.: Monitoring Well Approval # 0564
cc: Trident District EQC



Date of Issue: 20 August 1999
Approval No: 0564

2600 Bull Street
Columbia, SC 29201-1708

Monitoring Well Installation Approval

COMMISSIONER:
Douglas E. Bryant

Approval is hereby granted to: Charleston Naval Complex/Charleston Naval Base
(on behalf of): Chicora Tank Farm
Site ID#: 13350
County: Charleston

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
Vice Chairman

Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

This approval is for the construction of eighteen (18) monitoring wells designated (no designation) in accordance with the construction plans and technical specifications contained in the Final CSAP dated 30 August 1994. The monitoring wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well be submitted to within thirty (30) days of completion (of last well(s) installed).
(to be submitted with Assessment Report)
2. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
3. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Trident District EQC Office (843-740-1590).
4. Please provide groundwater quality analytical data (chemical analyses and/or water level(s)) and associated measurements (i.e., field measurements) to Paul L. Bristol within thirty (30) days of receipt from laboratory.
(to be submitted with Assessment Report)
5. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
6. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification number.
(for permanent wells, only)

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by:



Paul L. Bristol, P.G.
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC



DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. BOX 180010
2155 EAGLE DRIVE
NORTH CHARLESTON, S.C. 29419-9010

Li 12-31-99
L01-28-00

5090
Code 1849
23 Dec 99

South Carolina Department of Health and Environmental Control
Attn: Mr. Paul Bristol
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, SC 29201

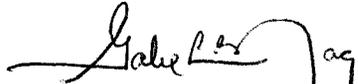
**COMPLETION REPORT FOR THE DEMOLITION AND CLEANING OF
CHICORA TANK FARM TANKS K, L, M, N, AND O**

Dear Mr. Bristol:

Enclosed are two (2) copies of both the Demolition and Cleaning Completion Reports for the Chicora Tank Farm Tanks K, L, M, N and O, Charleston Naval Base, Charleston, SC.

If you have any questions please contact me at (843) 820-7307.

Sincerely,


GABRIEL L. MAGWOOD
Remedial Project Manager

Encl:

- (1) Completion Report for the Demolition of Tanks K, L, M, N and O (2 copies)
- (2) Completion Report for the Cleaning of Tanks K, L, M, N and O (2 copies)

RECEIVED

DEC 28 1999

Water Monitoring, Assessment &
Protection Division

June 14, 1995

VIA FAX AND CERTIFIED MAIL

Commander's Office
Fleet and Industrial Supply Center
1545 Second Street West
Suite C
Code 700
Charleston, South Carolina 29408-1968

Re: Chicora Tank Farm

Dear Sir:

Lieutenant Paul Faneuf has discussed the Chicora Fuel Storage Tanks with the Divisions of Solid Waste Management and Groundwater Protection to determine the regulatory requirements for closure of the tanks. According to Lt. Faneuf, the tanks will be cleaned and the piping sealed with a concrete slurry. The tanks will then be imploded on-site and covered. In talking with Lt. Faneuf, it is my understanding that groundwater monitoring wells have not detected any contamination at the site and leak-detection tests have indicated that the tanks have not leaked. Also, soil borings have not shown contamination. Mr. Tim Mettlen has informed me that the Groundwater Protection has issued a letter stating that no further action is necessary.

Lt. Faneuf stated that core samples of the concrete would be analyzed for petroleum contamination. Please submit results of the sample analysis to the Department for review. To be approved for on-site disposal, the samples must indicate less than one (1) ppm for BTEX and less than ten (10) ppm for petroleum hydrocarbons. Should sampling results fall within acceptable limits, the tanks may be imploded, then covered with at least two feet (2') of soil, and the soil seeded.

March 6, 1995

Department of the Navy
Fleet and Industrial Supply center
Attention: Lt. Wayne Snodgrass
Charleston, South Carolina 29408-6300

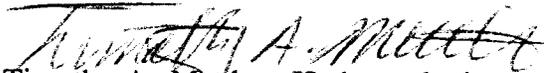
RE: Chicora Tank Farm. GWPD #A-10-AA-13350
Tank Closure Proposal received December 29, 1994
Charleston County

Dear Lt. Snodgrass:

The Ground Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced proposal. The GWPD does not have the authority to approve or disprove the closure of non-regulated, field constructed tanks. However, review of the proposal indicates that the procedures appear acceptable. Please note, this does not preclude the State from being notified if environmental impact is noted during the closure activities as any impact would be a violation of the Pollution Control Act. In addition, disposal of any contaminated wastewater generated during dewatering, flushing, etc. may require prior approval from the Bureau Water Pollution Control (BWPC).

The GWPD would appreciate remaining involved in the tank closure activities at the Chicora Tank Farm. Please notify the GWPD when closure activities are initiated so that a site visit may be arranged. Any questions, please call me at (803) 734-5328.

Sincerely,


Timothy A. Mettlen, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division
Bureau Drinking Water Protection

tam/cnbchic.clo

cc: Joe Bowers, BSHWM
Doyle Brittain, USEPA, Region IV, 345 Courtland Street N.E., Atlanta, GA 30365
Christine Sanford-Coker, Trident District EQC



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

4WD-FFB

February 15, 1995

HAND DELIVERY

Captain K. C. Brasher
Commanding Officer
Department of the Navy
Fleet and Industrial Supply Center
Charleston, South Carolina 29408-6300

RECEIVED
FEB 22 1995
Groundwater Protection
Division

SUBJ: Chicora Tank Facility Closure Plan

In reference to your December 21, 1994, request, the U.S. Environmental Protection Agency (EPA) has reviewed and concurs with the proposed Chicora Tank Facility Closure Plan. Please note that this is an environmental program which EPA has delegated to the South Carolina Department of Health and Environmental Control (SCDHEC) and therefore should be coordinated closely with them. Also, the Base Closure Office at Naval Base Charleston is coordinating all Base closure activities and therefore should also be included in this effort.

If you have any questions or if I can be of assistance, please call me at (803) 743-9985 or (404) 347-3555, EXT. 2061. Thank you for your cooperation in this matter.

Sincerely,

Doyle T. Brittain
Senior Remedial Project Manager

cc: Lieutenant Wayne Snodgrass, FISC
Tim Metten, SCDHEC
Ann Ragan, SCDHEC
Pat Franklin, COMNAVBASE
Bobby Dearhart, COMNAVBASE



DEPARTMENT OF THE NAVY
FLEET AND INDUSTRIAL SUPPLY CENTER
CHARLESTON, SOUTH CAROLINA 29405-1300

RECEIVED

DEC 29 1994

Groundwater Protection
Division

IN REPLY REFER TO:

Ser 700/
21 DEC 1994

South Carolina Department of Health and Environmental Control
Attn: Mr. Timothy A. Mettlen, GWPD
2600 Bull Street
Columbia, SC 29201

Gentlemen:

This letter concerns the status of the United States Navy's fuel facility located in the Chicora neighborhood of North Charleston. The facility was deactivated as a result of our decision to construct new storage tanks at Charleston Naval Station, rather than bring the older Chicora facility into compliance with new Underground Storage Tank regulations. For information, the Chicora facility has the following designation in your files: GWPD site# A-10-AA-13350.

In order to coordinate closure actions of the Chicora facility with the community redevelopment plan for the closing Naval Base complex and to determine funding sources, we delayed determining and proposing specific closure actions. We now have determined our desired course of action and are requesting your review and comments concerning our proposal. Enclosure (1) is a preliminary document which provides an overview of the Chicora facility in layman's terms with a brief outline of our intended closure actions. Simultaneously with your review of the enclosure, the Navy Petroleum Office at Cameron Station in Alexandria, Virginia will be submitting a proposed project for approval to the Defense Fuel Supply Center. Once approved by the Defense Fuel Supply Center, the project will be initially funded for a detailed engineering and design study. The finished product of the engineering and design study will be submitted to you and the United States Environmental Protection Agency, Region IV, for formal approval prior to solicitation of bids on the contract.

It is imperative we receive your comments concerning our proposal as soon as possible. My point of contact is Lieutenant Wayne Snodgrass. He may be reached at (803) 743-6086 and FAX (803) 743-1129.

Sincerely,

K C BRASHER
CAPT SC, USN
COMMANDING OFFICER

Encl:

(1) Chicora Facility closure proposal

RECEIVED

DEC 29 1994

Groundwater Protection
Division

CHICORA TANK FACILITY

CLOSURE PLAN

LOCATION/DESCRIPTION OF FACILITY

The Chicora Tank Facility (CTF) is located approximately one mile from the Viaduct Avenue gate of the Charleston Naval Station, and is bounded by Chicora Parkway, Clements Avenue, and Carner Avenue (U.S. 52 Alt). The area is residential in nature, with a few small businesses and the Norman C. Toole Middle School adjacent to the property. The property consists of approximately 24 acres, including easements, and was acquired in the early 1940's for construction of a fuel storage facility. CTF was designed and constructed to augment fuel storage capability at the Charleston Naval Shipyard during World War II. The basic facility consists of six "cut and cover" storage tanks, three buildings, a french drain system with retention pond, and associated underground piping systems.

DESCRIPTION OF STRUCTURES

The six "cut and cover" storage tanks were constructed using a standard design prevalent in Navy fuel storage tanks during the 1930's and 1940's. The material is concrete and was poured in three sections; the floor, the walls, and the roof. Construction methodology varied from site to site, and no records have been located for this particular site. However, a "standard" method will be described for information purposes. The name "cut and cover" is descriptive of the construction method. The area is cut to a depth which would place 1/3 of the storage tank above grade and 2/3 below grade. The actual depth may be dependent on the water table and other concerns at the site. Once the area is cut and leveled, pilings may be placed for support. The floor of the tank is poured, followed by the walls, roof supports, and roof. A bed of tiles is placed surrounding the tank bottom, the tiles are graded to a sump location in the adjacent pump room, and pea gravel is placed over the tiles. This particular method of construction allows for any material which may surround the tank (either leaked from within the tank or flowing from external sources, i.e. ground water) to be channeled by gravity into a sump location. The tank is then covered with earth removed from the excavation, rising to several feet above grade. Five of the six "cut and cover" tanks at the CTF are of the same size, 50 thousand barrels (approximately 2 million gallons). The sixth tank was constructed to process what is commonly called "tank bottoms" (primarily bottom sediment and water or BS&W) and is 27 thousand barrels (approximately 1 million gallons). The storage tanks are connected by two pipelines, an 18-inch main transfer

pipeline and a 4-inch sludge transfer pipeline. Each tank has a transfer station located in an adjacent below grade pump room.

CTF is connected via two 18-inch pipelines to the Main Tank Facility located at the corner of Hobson and Viaduct Avenues on the Charleston Naval Station. Within CTF, the pipeline is referred to as the "loop" due to the circular layout connecting all of the tanks. Once departing the "loop", the pipelines are referred to as the south and north CTF pipelines. The south pipeline was abandoned in the mid-1980's and proceeds from CTF alongside Reynolds Avenue, entering the Naval Station at the fields adjacent to the Picnic grounds. The north pipeline was recently active and proceeds from CTF alongside Redwood Avenue, entering the Naval Station near the Baseball field at the Picnic grounds. Pipeline depth varies considerably from as much as 40 feet below grade to only three feet below grade. The four inch sludge transfer pipeline follows the same route as the south pipeline.

The three buildings are concrete block buildings with adjacent blast walls. The main building is two stories tall and approximately 1000 square feet. It contains storage areas and a small workshop area for working on pumps, valves, etc. The other two buildings are approximately 250 square feet and contain electrical transformers.

HISTORY OF THE FACILITY

The fuel which was originally stored at the Chicora Tank Facility was a viscous burner fuel commonly referred to as "Bunker C" or "black oil". Black oil was replaced by a fuel which was less viscous and more closely resembled today's diesel fuel except for color, allowable sediment levels, etc. This fuel was referred to as Navy Special Fuel Oil or "NSFO". The changeover from black oil to NSFO was fairly quick and occurred in the mid 1950's. However, improvements in burner technology and associated performance levels coupled with increased emphasis on conservation caused the Navy to begin transitioning to a "cleaner" fuel. The newer fuel, called Diesel Fuel Marine (DFM) or by it's NATO designation of F76, required new ships or extensive modifications to older ships. The changeover began in the 1970's and was completed in Charleston in the late 1980's. In summary, CTF originally was built to store black oil in the 1940's, transitioned to NSFO in the 1950's, began transitioning to DFM in the 1970's and completed the change in the late 1980's.

In the late 1980's, Underground Storage Tank regulations caused the Navy to evaluate the feasibility of modifying the six tanks at CTF to meet the newer requirements for leak detection, etc. The expense of the regulatory modifications to CTF made the construction of larger storage tanks at the Main Tank Farm (MTF) more cost effective and a project to construct these tanks was submitted and approved. The removal of two tanks at the MTF and the construction of two larger tanks was completed in 1993. Upon completion of the new tanks, the last of the DFM was transferred from CTF. CTF was closed awaiting the results of excessing

procedures, development of a closure plan, and clarifications concerning funding for the closure actions. However, due to unforeseen operational circumstances, CTF was temporarily returned to use for a short period of time in late 1993 and early 1994. Three storage tanks were used for temporary storage of Fuel Oil Reclaimed (FOR) during a period when FOR production exceeded demand and storage capacity. For information, FOR (very similar in properties to NSFO) is produced from the processing of oily bilge water from naval ships and therefore is directly related to the quantity received from the ships in port. The acceptance of the oily bilge water cannot be limited without adverse effects on the safety of fleet units.

ENVIRONMENTAL ISSUES

Due to the age of the facility and construction materials, environmental concerns are reasonable and expected. Complete records from construction to the present time with regard to oil spills or leaks are unavailable, but records of more recent occurrences have been maintained. These records and preliminary sampling were utilized to develop a comprehensive groundwater monitoring program which began in 1992 and was completed in 1994.

The results of this study have been reviewed by South Carolina Department of Health and Environmental Control (DHEC). DHEC issues a determination of no significant contamination, but with a caveat not ruling out Navy responsibility for any future discovery.

Contamination of the soil and the surrounding area is always a possibility when dealing with large underground storage tanks of this age. However, the Navy is relatively confident that the construction methodology, quality of workmanship, quality of materials, and routine maintenance produced a facility that has resulted in a low probability of contamination problems. Nonetheless, if soil contamination or other environmental problems are discovered, the Navy will work with the Federal Environmental Protection Agency and South Carolina DHEC to determine a satisfactory remediation plan.

PROPOSED PLAN FOR ABANDONMENT OF PIPELINES

Modern pipelines are designed with low point connections for stripping the pipeline of petroleum products. Additionally, modern pipelines are also designed for mechanical cleaning through the use of devices referred to as "pigs". A Pig fits tightly in the pipeline and is forced through the pipeline using some form of pressure, such as water or a petroleum product. The Pig scrapes the interior of the pipeline as it travels along, pushing sediment and sludge ahead. However, the pipeline must be designed for the use of pigs, providing for more sweeping changes in direction and pig transfer stations for loading/unloading. Unfortunately, the pipelines which were installed during the 1940's in CTF were not designed for stripping of petroleum

products or cleaning by mechanical means. Consequently, the abandonment of CTF pipelines will be more difficult and expensive. A modified pipeline pig system will be required to accommodate the older petroleum lines.

Wherever physically possible, pipelines will be excavated at valve connections and sharp turns. Valves will be removed and processed for disposal. These alterations will allow the pipelines to be flushed with water and then pigged to remove sludge and sediment. Once pigged, the pipelines will be capped on one end and filled with an inert material such as cement grout (fly ash). The grout slurry consists of portland cement, fluidifier, sand, and water. The grout will harden to a compressive strength of 4000 PSI after about 28 days. The pipeline will then be capped on the remaining uncapped end and the excavation areas filled in. Eventually, the pipeline itself will corrode away, leaving a solid bar of cement-like material.

At the present time, it does not appear that excavation outside of Navy property will be necessary.

PROPOSED PLAN FOR DEMOLITION OF TANKS AND STRUCTURES

All above ground structures will be demolished and the rubble removed from the site. The concrete foundations will remain as the foundations will be well below grade when the facility is restored. Utilities will be terminated where they enter the site, with the exception of fire hydrant pipelines which will remain active. Underground electrical wiring will be terminated in accordance with code and abandoned in place.

All sludge and sediment will be removed from the six cut-and-cover storage tanks and the tanks thoroughly cleaned with a mild detergent. The tanks will be excavated to a depth of at least six feet below present grade. Charges will be placed and detonated to cripple the supporting roof columns, so that the roofs may be collapsed by a wrecking ball. Once the roofs are collapsed, the walls of the tanks will be collapsed inward onto the roof rubble. Inert sand and fill will be brought in to bury the rubble up to the present grade.

Adjacent pump rooms will be abandoned in much the same way. However, all pumps, motors, valves, and piping within the pumprooms will be removed and disposed of prior to demolition. The roofs will be collapsed and the walls collapsed inward onto the roof rubble.

The above procedures have been utilized to abandon similar cut-and-cover storage tanks at other Navy sites. The most recent use of this procedure has been at the Defense Fuel Support Point (DFSP) at Craney Island in Portsmouth, VA. The DFSP is operated by the Fleet and Industrial Supply Center, Norfolk, VA.

PROPOSED PLAN FOR RESTORATION OF FACILITY

Once the pipelines have been abandoned and the storage tanks and structures demolished, the area will be built up to the grade of the surrounding roads using good topsoil. The Engineering firm used to develop the abandonment and demolition detailed

plans will be requested to evaluate the site for proper drainage of runoff and to recommend various courses of action. The recommendations should take into account the existing "French Drain" system and holding pond. The Navy would implement the recommendations, subject to agency approval (Local, State, and Federal), to ensure the site remains in good condition.

It is our understanding that the current redevelopment plan for CTF shows the area to be a park-type environment. To this end, the Navy would conduct minimal landscaping, such as bermuda grass and small shrubs/trees, to ensure erosion does not occur or is kept to a bare minimum while awaiting conveyance to the community. Additionally, current fencing would remain in place pending community action after conveyance.

Commissioner: Douglas E. Bryant

Board: Richard E. Jabbour, DDS, Chairman
Robert J. Stripling, Jr., Vice Chairman
Sandra J. Molander, Secretary

William E. Applegate, III,
John H. Burriss
Tony Graham, Jr., MD
John B. Pate, MD

Promoting Health, Protecting the Environment

May 17, 1994

Commanding Officer
Attn: Mr. Daryl Fontenot (Code 1841)
Southern Division
Naval Facilities Engineering Command
2155 Eagle Dr., P.O. Box 190010
North Charleston, SC 29419-9101

RE: **CNS - Chicora Tank Farm, GWPD Site #A-10-AA-13350**
Fourth Quarter Monitoring Report received February 14, 1994
Assessment Report received April 26, 1994
Charleston County

Dear Mr. Fontenot:

The Ground-Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control has reviewed the referenced Monitoring Report and Assessment Report. The GWPD concurs with the request for "No Further Action" at the referenced Site. Therefore, this office will not require any further investigation at this site at this time. However, if any contamination is indicated in the future, additional assessment and/or remedial activities may be necessary.

The referenced assessment report indicates that the tanks are to be closed and that limited impact may be identified during the tanks closures. Upon completion of the tank closures, a closure report documenting the closure activities and containing sampling data, should be submitted to the GWPD.

On all future correspondence concerning the Chicora Tank Farm, please reference GWPD Site #A-10-AA-13350. If you have any questions, please contact me at (803) 734-5328.

Sincerely,


Timothy A. Mettlen, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division
Bureau of Drinking Water Protection

Commissioner: Douglas E. Bryant

Board: Richard E. Jabbour, DDS, Chairman
Robert J. Stripling, Jr., Vice Chairman
Sandra J. Molander, Secretary

Promoting Health, Protecting the Environment

William E. Applegate, III,
John H. Burriss
Tony Graham, Jr., MD
John B. Pate, MD

file

November 1, 1993

Commanding Officer
Attn: Mr. Daryl Fontenot (Code 1841)
Southern Division
Naval Facilities Engineering Command
2155 Eagle Dr., P.O. Box 190010
North Charleston, SC 29419-9101

RE: CNS - Chicora Tank Farm, GWPD Site #A-10-AA-13350
Second Quarter Monitoring Report received July 26, 1993
Charleston County

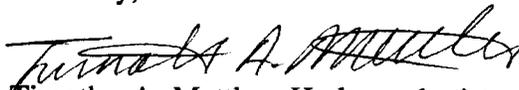
Dear Mr. Fontenot:

The Ground-Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control has reviewed the referenced Monitoring Report and has the following comments:

- 1) All monitoring well samples and french drain manhole samples were below detection for the constituents analyzed. However, the detection limits for sample FD-3 were elevated due to organic interference.
- 2) The sample from FD-3, as described in the report, exhibited the presence of organics causing chromatograph interference and increasing the detection limit. Most likely the organics are of a hydrocarbon nature. The GWPD recommends that an effort be made to identify the exact compounds present.

On all future correspondence concerning the Chicora Tank Farm, please reference GWPD Site #A-10-AA-13350. If you have any questions, please contact me at (803) 734-5328.

Sincerely,



Timothy A. Mettlen, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division
Bureau of Drinking Water Protection

July 29, 1993

Commanding Officer
Charleston Naval Shipyard
Attn: Mr. John Sneed
Building 12, Code 460
Charleston Naval Base
Charleston, SC 29408-6100

RE: CNS - Chicora Tank Farm, GWPD Site #A-10-AA-13350
First Quarter Monitoring Report received May 13, 1993
Charleston County

Dear Mr. Sneed:

The Ground-Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control has reviewed the referenced Monitoring report and has the following comments:

- 1) The ground-water elevation data indicates monitoring wells MW-2, MW-3, MW-8, and MW-11 do not bracket the water table and that a few other wells are constructed such that a small increase in the height of the water table will cause it to rise above the top of the screens. This potential problem should be considered during future monitoring events.
- 2) Analysis of sediment samples utilizing method 418.1 indicate total petroleum hydrocarbon contamination at 1200 milligrams per kilogram (mg/kg) and 610 mg/kg in two of nine samples. Analysis utilizing methods 8020 (BTEX) and 8100 (PAHs) did not detect any parameters at levels of concern. Since the type of methodology of 418.1 may cause false positive based on organic content of the samples and since no parameters were identified at levels of concern utilizing the other two methodologies, the GWPD recommends confirmation sampling of the sediments utilizing TPH methods 3550 (gasoline fraction) and 5030 (diesel and kerosene fractions).

Please address the above concerns on future monitoring reports as previously

KEMRON
ENVIRONMENTAL SERVICES

2987 Clairmont Road ■ Suite 150 ■ Atlanta, Georgia 30329 ■ Telephone (404) 636-0928 ■ FAX (404) 636-7162

Project 6544

Department of Health and Environmental Control
Groundwater Protection Division
Attn: Mr. Tim Mettlin
2600 Bull Street
Columbia, SC 29201

14 April 1993

14
20
MAY 17 1993
Groundwater Protection
Division

RE: Submittal of Final Installation Work Plan and Results of First Quarterly Monitoring Event for Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina
GWPD Site #A-10-AA-13350

Dear Mr. Mettlin:

Please find enclosed two copies of the referenced report. The report includes both a discussion of the Installation Work Plan, as previously presented in the Preliminary Contamination Assessment Report/Contamination Assessment Plan, July 1992, and the results of the first quarterly sampling and analysis event.

This first quarterly event included sampling and analysis of sediment samples from the retention pond, removal of free-phase product from the french drain system, and collection and analysis of groundwater samples from groundwater monitoring wells and the french drain system. Subsequent quarterly events, as discussed in the Work Plan, will include sampling and analysis of groundwater samples only.

If you have any questions or require additional information concerning the report, please contact me at 404-636-0928.

Sincerely,
KEMRON Environmental Services, Inc.



Andrew Clark
Project Manager

CC: Commanding Officer
Attn: Mr. Darryl Fontenot (Code 1841)
Southern Division
Naval Facilities Engineering Command
2155 Eagle Dr., P.O. Box 190010
North Charleston, SC 29419-9101



Printed on
Recycled Paper

Protecting Our Environmental Future

February 4, 1993

J. W. Sneed
Head, Environmental Protection Division
Charleston Naval Shipyard
Charleston Naval Base
Charleston, SC 29408-6100

RE: CNS - Chicora Tank Farm, GWPD Site #A-10-AA-13350
Preliminary Contamination Assessment Report/Contamination
Assessment Plan received July 23, 1992

Dear Mr. Sneed:

The Ground-Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control has reviewed the referenced submittal. The proposals to:

- * Collect sediment samples from the retention pond,
- * remove accumulated free product from the french drain system,
- * and to implement a quarterly ground-water monitoring scheme for the eleven (11) monitoring wells and to sample the three (3) french drain man holes quarterly.

are acceptable as outlined. The first quarter of monitoring (and sediment sampling) should commence by March, 1993, and submitted to the GWPD on or before May 22, 1993.

The SCDHEC apologizes for the delay in responding to the referenced submittal, your understanding is appreciated. On all future correspondence concerning the Chicora Tank Farm, please reference GWPD Site #A-10-AA-13350. If you have any questions, please contact me at (803) 734-5328.

Sincerely,



Timothy A. Mettlen, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division
Bureau of Drinking Water Protection

file

MEMORANDUM

To: Chuck Arnold, Manager
Waste Assessment Section
Bureau of Solid & Hazardous Waste

From: Scott McInnis, Hydrogeologist *SM*
Assessment & Development Section
Ground-Water Protection Division
Bureau of Drinking Water Protection

Re: Charleston Naval Base, GWPD Site # A-10-AA-13350
Request for Soil Disposal - Bldg. 12a & 5
(received August 26 and September 14, 1992)
Charleston County

Date: October 14, 1992

The referenced analytical results and proposed method of soil disposal are enclosed for your review. Please provide all comments to this office.

If you have any questions, please call me at 734-5465.

sm\bld12a&5.dis

ENC: Soil Analysis



120

TRIDENT LABS, INC. — Analytical Laboratory
SOIL, WATER, WASTEWATER & INDUSTRIAL CHEMICAL ANALYSIS

Certificate of Analysis

SUBJECT: ANALYTICAL REPORT

YEAR: 1992

CLIENT: THICKSTUN BROTHERS
2181 DUNLAP STREET
SUMMIT PLACE APT. 9-C
NORTH CHARLESTON SC 29418

ATTENTION: MR. LAWRENCE EVANS

SET NO.: 3701
LOCATION: SEE BELOW

COLLECTION					ANALYSIS				UNITS	CONC
DATE	TIME	LOC	PRES	OPER	DATE	TIME	ANAL	PAR		VALUE
M/D	MIL	CODE	CODE	INIL	M/D	MIL	INIL	ABB		
0819	1030	#1	NA	NL	0826	1555	DB	TPH-F	MG/KG	79.9
0819	1020	#2	NA	NL	0826	1706	DB	TPH-F	MG/KG	91.0
0819	1000	#3	NA	NL	0826	1800	DB	TPH-F	MG/KG	256
0819	1030	#1	NA	NL	0828	1640	DB	NAPHTHALENE	UG/KG	<30
0819	1020	#2	NA	NL	0826	1924	DB	NAPHTHALENE	UG/KG	44
0819	1000	#3	NA	NL	0828	1730	DB	NAPHTHALENE	UG/KG	578

#1-BLDG #89
#2-708 NWC
#3-93 PILE NWC

NA-NOT APPLIABLE
NL-NON LAB
DB-DAN BIGGERSTAFF

ANALYSES WERE PERFORMED ACCORDING TO SCDHEC PROTOCOL FOR TOTAL PETROLEUM HYDROCARBON ANALYSIS BY GC/FID

TPH-F ANALYZED AGAINST A #2 FUEL OIL STANDARD.
QC EXTRACTION RECOVERY 90%

NAPHTHALENE ANALYZED BY EPA METHOD 8310

LABORATORY I.D. NO. 10122
CERTIFICATE NO. 91077-E
REPORT APPROVED BY:

Information in this report is reliable to the best of our knowledge; this and all reports are the sole property of our clients.



SOUTHEASTERN SOIL RECOVERY, INC.

September 11, 1992

Mr. David Baize
Bureau of Ground Water Protection Division
SC DEPARTMENT OF HEALTH & ENVIRONMENTAL CONTROL
2600 Bull Street
Columbia, South Carolina 29201

Re: SSR Project #92256

GENERATOR

US NAVY PUBLIC WORKS
Bldg. 5, Naval Weapons Station
Charleston, S.C. 29408
Att: Ms. Natalie Finholm
(803) 764-7400
Contract #N62467-92-C-5776

ENVIRONMENTAL FIRM

THICKSTUN BROS. EQUIPMENT CO.
841 Alton Avenue
Columbus, Ohio 43219
Att: Mr. Ken Thickstun
(803) 863-8711 (Chas.)

Dear Mr. Baize:

SSR respectfully requests permission to incinerate ± 500 tons of soil contaminated with #2 heating oil from the referenced generator's site.

SSR intends to recycle 100% of this contaminated soil into hot-mix asphalt at the facilities of Banks Construction Company, Inc., as a raw material (resource recovery).

Your cooperation is appreciated.

Yours Very Truly,

SOUTHEASTERN SOIL RECOVERY, INC.

Robert K. Willms, Jr.
Partner

Enclosures
RKW/dc

RECEIVED
SEP 14 1992
SOUTHEASTERN SOIL RECOVERY, INC.

Specializing in Remediating Petroleum Contaminated Soil



GENERAL ENGINEERING LABORATORIES

Environmental Engineering and Analytical Services

Molly F. Greene
President

George C. Greene, P.E., Ph.D.
Vice President
SC Registration No. 9103

Laboratory Certifications:
FL E87156/87294
NC 233
SC 10120
VA 00151
TN 02934
WI 99988779

CERTIFICATE OF ANALYSIS

Client: Laidlaw Environmental Services
7630 A South Rail Street
North Charleston, South Carolina 29418
Contact: Mr. Steve Ennis

Date: 08/17/92

Released by: 

QA/QC Officer

cc: LAID00591

Project Manager: Pete Ballou

Page No.: 1

Sample ID	: Hole 2 Navy Gas Station
Lab ID	: 9208228-02
Matrix	: Soil
Date Collected	: 08/12/92
Date Received	: 08/13/92
Priority	: Urgent
Collector	: Client

Volatile Organics

BTEX

Benzene	38400 ppb
Ethylbenzene	470000 ppb
Toluene	176000 ppb
Xylenes (TOTAL)	648000 ppb
TPH - Volatile Fraction	2990000 ppb

Organic Prep

Evaporative Loss @ 105 C	15.0 wt%
--------------------------	----------

Comments:



GENERAL ENGINEERING LABORATORIES

Environmental Engineering and Analytical Services

Molly F. Greene
President

George C. Greene, P.E., Ph.D.
Vice President
SC Registration No. 9103

Laboratory Certifications:
FL ES7156/87294
NC 233
SC 10120
VA 00151
TN 02934
WI 99988779

CERTIFICATE OF ANALYSIS

Client: Laidlaw Environmental Services
7630 A South Rail Street
North Charleston, South Carolina 29418

Date: 08/17/92

Contact: Mr. Steve Ennis

Released by: *[Signature]*

QA/QC Officer

cc: LAID00591

Project Manager: Pete Ballou

Page No.: 1

Sample ID	:	Hole 1 Navy Gas Station
Lab ID	:	9208228-01
Matrix	:	Soil
Date Collected	:	08/13/92
Date Received	:	08/13/92
Priority	:	Urgent
Collector	:	Client

Volatile Organics

BTEX

Benzene	< 109 ppb
Ethylbenzene	371 ppb
Toluene	272 ppb
Xylenes (TOTAL)	1370 ppb
TPH - Volatile Fraction	191000 ppb

Organic Prep

Evaporative Loss @ 105 C	8.00 wt%
--------------------------	----------

Comments:

A dilution was required for the BTEX analysis due to high concentration of target and non-target compound(s). As a result, the detection limits are elevated.



SOUTHEASTERN SOIL RECOVERY, INC.

August 25, 1992

Mr. David Baize
Bureau of Ground Water Protection Division
SC DEPARTMENT OF HEALTH & ENVIRONMENTAL CONTROL
2600 Bull Street
Columbia, South Carolina 29201

Re: SSR Project #92275

GENERATOR

US NAVY PUBLIC WORKS
Bldg. 12-A Code 412
Charleston Navy Base
Charleston, S.C. 29408
Att: N62467-91-C-3593
(803) 743-1194

ENVIRONMENTAL FIRM

LAIDLAW ENVIRONMENTAL SERVICES
7630 Southrail Street
North Charleston, S.C. 29418
Att: Mr. Steve Ennis
(803) 569-3546

Dear Mr. Baize:

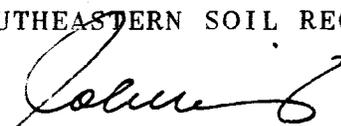
SSR respectfully requests permission to incinerate +225 cubic yards petroleum contaminated soil from a virgin UST closure project.

SSR intends to recycle 100% of this contaminated soil into hot-mix asphalt at the facilities of Banks Construction Company, Inc., as a raw material (resource recovery).

Your cooperation is appreciated.

Yours Very Truly,

SOUTHEASTERN SOIL RECOVERY, INC.


Robert K. Willms, Jr.
Partner

Enclosures
RKW/dc

cc: Steve Ennis

RECEIVED
AUG 26 1992
Groundwater Protection
Division

Specializing in Remediating Petroleum Contaminated Soil

P.O. Box 70253 • Charleston, SC 29415 • (803) 566-7065 FAX (803) 566-7066

LI ✓
LO ✓

Project 819-300

17 July 1992

Mr. Scott McInnis, Hydrogeologist
Assessment and Development Section
Groundwater Protection Division
Bureau of Drinking Water Pollution
Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

RECEIVED

JUL 23 1992

Groundwater Protection
Division

RE: Chicora Tank Farm
Charleston Naval Shipyard
GWPD Site #A-10-AA-13350

Dear Mr. McInnis:

Please find enclosed three copies of the revised Final version of the Preliminary Contamination Assessment Report/Contamination Assessment Plan for the Chicora Tank Farm at the Charleston Naval Shipyard, Charleston, South Carolina. Your comments of 22 May 1992 have been received and incorporated into this revised final version. Your comments were incorporated as follows:

1. Benzene was detected in monitoring well MW-2 at 6 µg/l. This was correctly noted in Section 2.3.4 but incorrectly in Section 2.3.7 where the detection was noted as in MW-3. This error has been corrected.

This benzene detection is attributed to an offsite source for three reasons:

- i) Benzene is unlikely to have been present in measurable amounts in any of the products stored at the Chicora Tank Farm;
- ii) Well MW-2 is upgradient of the tank farm; and
- iii) Well MW-2 is downgradient of a trucking operation located across the street. There was formerly a paint and body shop located there.

A parenthetic remark has been added to the first paragraph of Section 2.3.7 to note the presence of the trucking operation upgradient.

lb:819300.ltr
7/14/92



There is a transmission shop upgradient of MW-7 and Tank P. No analytes were detected in soils or groundwater in this area, only soil vapors. Since the composition of these vapors is unknown, it is hard to speculate regarding potential sources. A sentence has been added to the first paragraph of Section 2.3.7 to note the existence of the transmission shop.

2. Free-product removal (§3.1.2.2) is planned for french drain manhole FD-3 only. Free product has not been observed in FD-1; only a sheen was observed in FD-2. Oil only accumulates in FD-3; it does so because it functions, in some ways, like an oil/water separator. See attached figure. Consequently, no changes have been made to this section.
3. Development water was drummed and held until laboratory results were available. Since all wells tested clean, except MW-2 which contained 6 µg/l of benzene, development water was discharged to the french drain system. Development water from MW-2 was allowed to stand open overnight, allowing the benzene to volatilize, prior to disposal. We regret that no request was made for prior approval of this disposal method.
4. Petroleum residues in FD-3 are believed to have accumulated due to a spill that occurred circa 1986 when Tank P was overtopped. Some employees at the site thought illegal dumping may have occurred but their basis for this belief appears to be merely the fact that an accumulation is present in FD-3. The slight petroleum sheen in the french drain beneath Tank P and the absence of contamination elsewhere supports the belief that the 1986 spill incident is the sole cause. There has been no illegal dumping that we know of or see any evidence of, and no report of illegal dumping has been filed.

The cause of the release has been determined as well as possible with the evidence available. Implementation of the Contamination Assessment Plan will supply additional evidence. The spill itself was eliminated when it occurred. That contaminated soils remain after six years, still capable of producing a sheen is not unusual. Insofar as a secondary release or rerelease occurs when traces of petroleum reach the french drain system, such rerelease had not yet been eliminated when the system was last observed.

5. Sections 3.1.2.3, 3.1.3.4 and 4.6 have been modified to substitute BTEX and PAH assays for TPH assays on all groundwater samples. In addition, MW-5 will be assayed for the eight RCRA metals.
6. A slight petroleum sheen was observed in wells MW-3 and MW-9 during development but no TPH, BTEX or PAHs were found analytically at these locations in either soil or groundwater samples. Generally, when this occurs, it is thought that the sheen is due to dragdown during drilling. Often, in the case of older petroleum releases to shallow soils, small pockets or nuggets of contamination persist for long periods of time. These

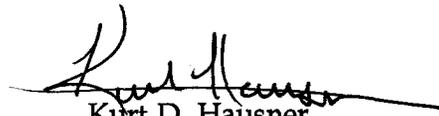
Mr. Scott McInnis
17 July 1992
Page 3

nuggets are hydrocarbon saturated and have outer layers composed of the more refractory, waxy constituents, small molecules having long since leached or evaporated. When these nuggets are mechanically disrupted during drilling, small droplets of petroleum, generally depleted in soluble constituents, can be dragged down into the area later screened. Since quantities of petroleum as low as 10 mg are readily observed as sheen, observation of a sheen does not imply that significant quantities of petroleum are present or contradict negative analytical results. Hence, we conclude that, in the vicinity of wells MW-3 and MW-9, small quantities of residues remain from historic releases, quantities of insufficient magnitude to be visually apparent and too weathered to product olfactory indications or soluble fractions detectable analytically.

7. See response to #5 above.

Kemron Environmental Services, on behalf of Southern Division Naval Facilities Engineering Command, is pleased to submit this Revised Final version (3 copies) of the PCAR/CAP for the Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina. If you have any further questions or comments on this matter, please do not hesitate to contact me at 404-636-0928 or Ms. Angela Jones, Engineer in Charge, at 803-743-0658.

Sincerely,



Kurt D. Hausner
Project Manager

KDH:ljb

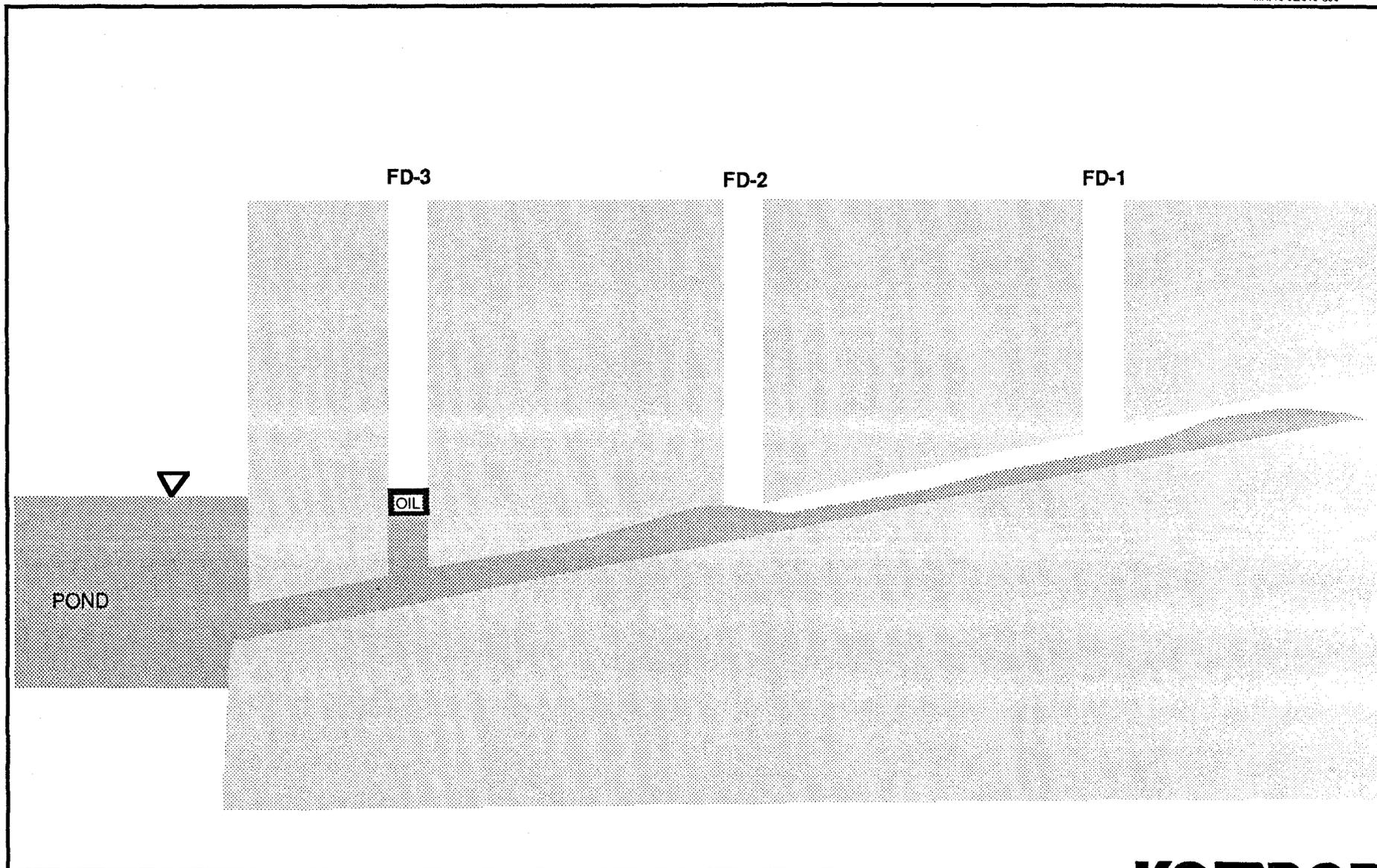


Figure 1. French drain manhole schematic with vertical exaggeration

Commissioner: Michael D. Jarrett

Board: William E. Applegate, III, Chairman
John H. Burris, Vice Chairman
Richard E. Jabbour, DDS, Secretary

Toney Graham, Jr., MD
Sandra J. Molander
John B. Pate, MD
Robert J. Stripling, Jr.

Promoting Health, Protecting the Environment

May 22, 1992

J.W. Sneed
Head, Environmental Protection Division
by Direction of the Commanding Officer
Charleston Naval Shipyard
Charleston Naval Base
Charleston, S.C. 29408-6100

Re: Charleston Naval Base
Chicora Tank Farm, GWPD Site # A-10-AA-13350
Preliminary Contamination Assessment Report/Contamination
Assessment Plan (received September 16, 1991)
Charleston County

Dear Mr. Sneed:

The Ground-Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the above referenced report, and the following comments are provided:

- 1) The report states that the presence of 6 ug/l benzene in upgradient monitoring well MW-3, and soil-gas concentrations detected west of and upgradient from tank P, suggests that low level petroleum contamination is migrating into the area from an off-site source. Please elaborate on the statement that the contamination is migrating into the area from an off-site source and what the source might be.
- 2) Free-product was observed in the three french drain access manholes; however, the report proposes only to remove the product from FD-3. Free-product should also be removed in FD-1 and FD-2. Continued sampling (PAHs and BETX) of the french drain system and retention pond is recommended to monitor the effectiveness of product removal.
- 3) The report states that development water was containerized in a 55-gallon drum and stored at a secure on-site location prior to proper disposal in accordance with existing federal and state regulations. All requests for wastewater and soils disposed should be submitted to this office. The request will be forwarded to the appropriate bureau within DHEC for review and

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division

2600 Bull Street

Columbia, S.C. 29201

(803) 734-5331

Water Well Record

1. LOCATION OF WELL

County: Charleston	System Name: Chicora Tank Farm MW 4
Latitude: <i>See forthcoming report</i> Longitude: <i>see forthcoming report</i>	
Distance And Direction from Road Intersections: 325 A. W of Clements Ferry Rd. 350 A. N of Hwy 52 Alt. See Attached Map	
Street address & City of Well Location	
Sketch Map: (See example on back) See Attached Map	

2. CUTTING SAMPLES Yes No

Geophysical Logs Yes (Please enclose) No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
See forthcoming report		
<div style="border: 2px solid black; padding: 5px; transform: rotate(-2deg); display: inline-block;"> <p style="font-size: 2em; margin: 0;">RECEIVED</p> <p style="font-size: 1.2em; margin: 0;">MAR 25 1991</p> <p style="font-size: 0.8em; margin: 0;">GROUND WATER PROTECTION DIVISION</p> </div>		
* Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

1448 Approval

4. OWNER OF WELL: Address: Charleston Naval Shipyard Charleston, SC UIC: M60169 Telephone No. (803) 743-6086	Engineer Address: Kemron Environmental Services 1815 Century Blvd., Suite 150 Atlanta, GA 30345 Telephone No. (404) 636-0928
5. WELL DEPTH (Completed) 12 ft. Date Started: 06/19/90 Date Completed: 06/21/90	
6. <input type="checkbox"/> Mud Rotary <input type="checkbox"/> Jetted <input checked="" type="checkbox"/> Bored <input type="checkbox"/> Dug <input type="checkbox"/> Air Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Cable tool <input type="checkbox"/> Other	
7. USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Public Supply-Permit No. _____ <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Test Well <input type="checkbox"/> _____	
8. CASING: <input checked="" type="checkbox"/> Threaded <input type="checkbox"/> Welded Diam. 2 inch Height: <u>Above</u> Below Type <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Galvanized Surface 1.34 ft. <input type="checkbox"/> Steel <input type="checkbox"/> Other Weight _____ lbs./ft. (+) 1.34 ft to 2 ft. depth Drive Shoe? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No _____ in. to _____ ft. depth	
9. SCREEN: Type: Sch. 40 PVC Diam. 2 inch Slot/Gauze 0.01 inch Length 10 ft. Set Between 2 ft. and 12 ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET _____ ft. and _____ ft. Sieve Analysis <input type="checkbox"/> Yes (Please enclose) <input checked="" type="checkbox"/> No	
10. STATIC WATER LEVEL 6.0 ft. below land surface after 24 hours	
11. PUMPING LEVEL Below Land Surface _____ ft. after _____ hrs. pumping _____ G.P.M. Pumping Test: <input type="checkbox"/> Yes (Please enclose) <input checked="" type="checkbox"/> No Yield _____	
12. WATER QUALITY Chemical Analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Bacterial Analysis <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Please Enclose Lab Results. see forthcoming report	
13. ARTIFICIAL FILTER (Gravel Pack) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Installed from 1 ft. to 16.5 ft. Effective size 20/30 uniformity coefficient _____	
14. WELL GROUTED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Neat Cement <input checked="" type="checkbox"/> Sand Cement <input type="checkbox"/> Concrete <input type="checkbox"/> Other <input type="checkbox"/> Depth From 0 ft. to 1 ft.	
15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: 50 Feet <u>W</u> Direction petroleum Type Well disinfected <input type="checkbox"/> Yes Type _____ upon completion <input checked="" type="checkbox"/> No Amount _____	
16. PUMP: Date Installed _____ not installed <input checked="" type="checkbox"/> Mfr. name _____ model no. _____ H.P. _____ volts _____ length of drop pipe _____ ft. capacity _____ gpm TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet (shallow) <input type="checkbox"/> Turbine <input type="checkbox"/> Jet (deep) <input type="checkbox"/> Reciprocating <input type="checkbox"/> Centrifugal	
17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief. REGISTERED BUSINESS NAME: Environmental Exploration Inc. ADDRESS: Red oak Rd Stockbridge GA 30081 Signed: Darryl E. Bray CERT. NO. 769 Date: 6/21/90 AUTHORIZED REPRESENTATIVE	

File

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

Commissioner: Michael D. Jarrett

Board: John B. Pate, MD, Chairman
William E. Applegate, III, Vice Chairman
John H. Burriss, Secretary

Toney Graham, Jr., MD
Richard E. Jabbour, DDS
Henry S. Jordan, MD
Robert J. Stripling, Jr.

Promoting Health, Protecting the Environment

June 7, 1991

Mr. Reese Batten
Code 11521
SOUTHNAVFACENGCOM
2155 Eagle Drive
P.O. Box 10068
Charleston, SC 29411-0068

Re: Chicora Tank Farm
Charleston Naval Shipyard - IRP Site
Preliminary Contamination Assessment Report
Received February 26, 1991
Charleston County

Dear Mr. Batten:

The Ground-Water Protection Division of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced report and proposed assessment plan, and the following comments are provided:

1. Please note that there appears to be an error on page 2-13. The direction of ground-water flow is stated to be to the west. However, it appears from the potentiometric surface map on page 2-15 that the ground water flows in an easterly direction under low water-table conditions.
2. The referenced report the suggests that the source of the sheen detected in sump FD-2, and the free product in sump FD-3 is upgradient and off-site. However, under both high and low water-table conditions, monitoring wells MW-1, MW-7 and MW-9 are upgradient of the french drain and the fuel tanks. Since ground-water analysis of the monitoring wells MW-1, MW-7 and MW-9 did not indicate any contaminants above detection limits, the conclusion that an off-site source is responsible for the observed contamination would not appear to be appropriate at this time.
3. Product from the french drain system is collected in the seepage pond: where does the seepage pond discharge?
4. According to the analytical data obtained on June 25, 1990 a ground-water sample was taken from a monitoring well MW-13. Where is the location of MW-13? There were no

KEMRON
ENVIRONMENTAL SERVICES

David
3

1815 Century Blvd. ■ Suite 150 ■ Atlanta, Georgia 30345 ■ Telephone (404) 636-0928 ■ FAX (404) 636-7162

Project 819-300

13 February 1991

Department of Health
and Environmental Control
1000 Air Park Road
Charleston Heights, SC 29418

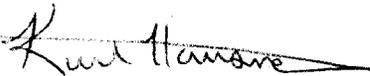
ATTN: Mr. Wayne Fanning

Please find enclosed three Draft Final copies of the Preliminary Contamination Assessment Report-Contamination Assessment Plan (PCAR-CAP) for the Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina. Please review these documents and send your comments to the contracting officer with Naval Facilities Engineering Command:

ATTN: Code 11521
SOUTHNAVFACENGCOM
2155 Eagle Drive
P.O. Box 10068
Charleston, SC 29411-0068

Southern Division would appreciate receipt of your comments within 60 days. Please notify Southern Division if you are unable to complete your review in this time-frame. Your attention to this matter is greatly appreciated.

Sincerely,



Kurt D. Hausner
Project Manager

Enclosures
cc: SouthDiv (Code 11521)

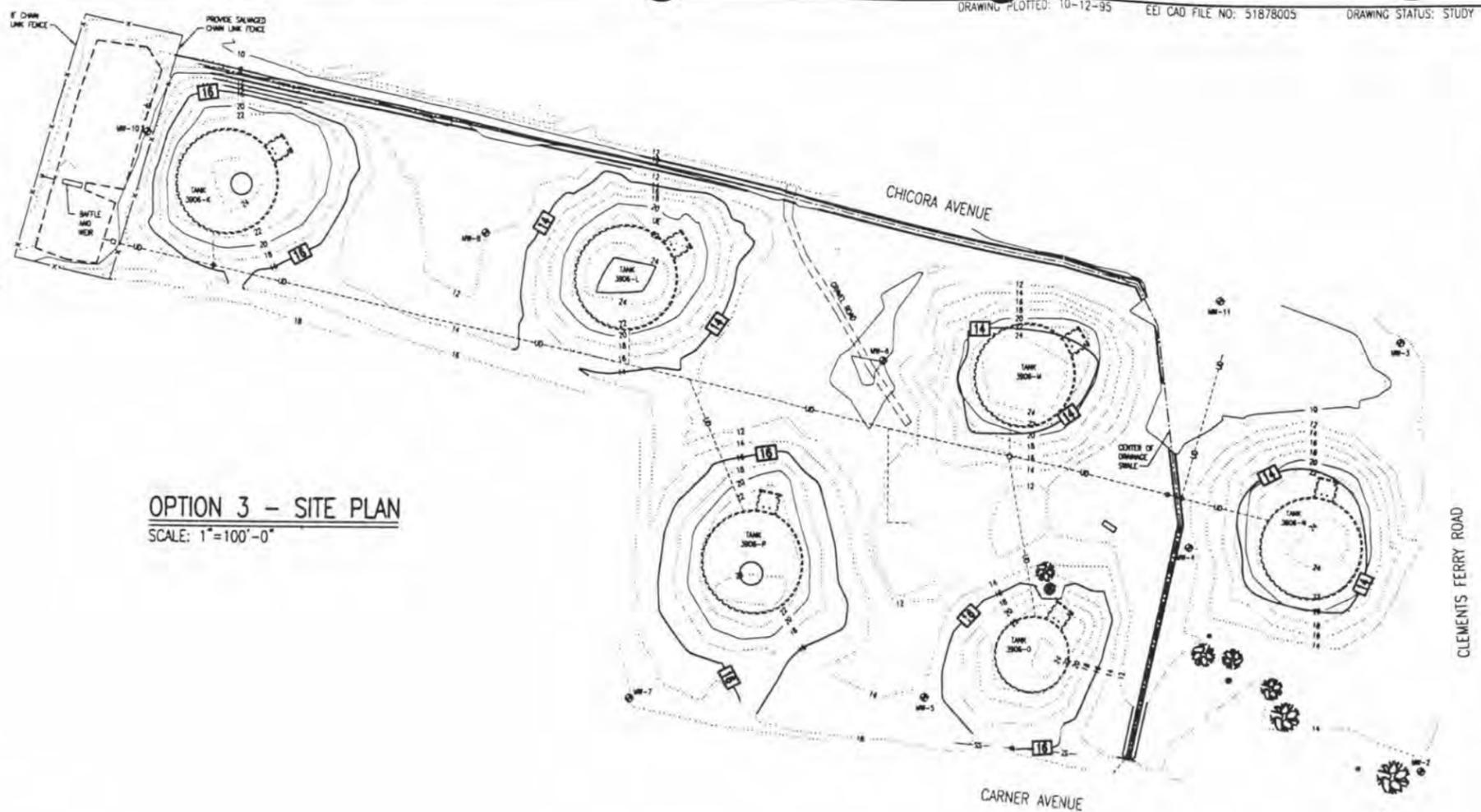
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FEB 26 1991
GROUND-WATER
PROTECTION DIVISION

CL: 819300b
2/13/91

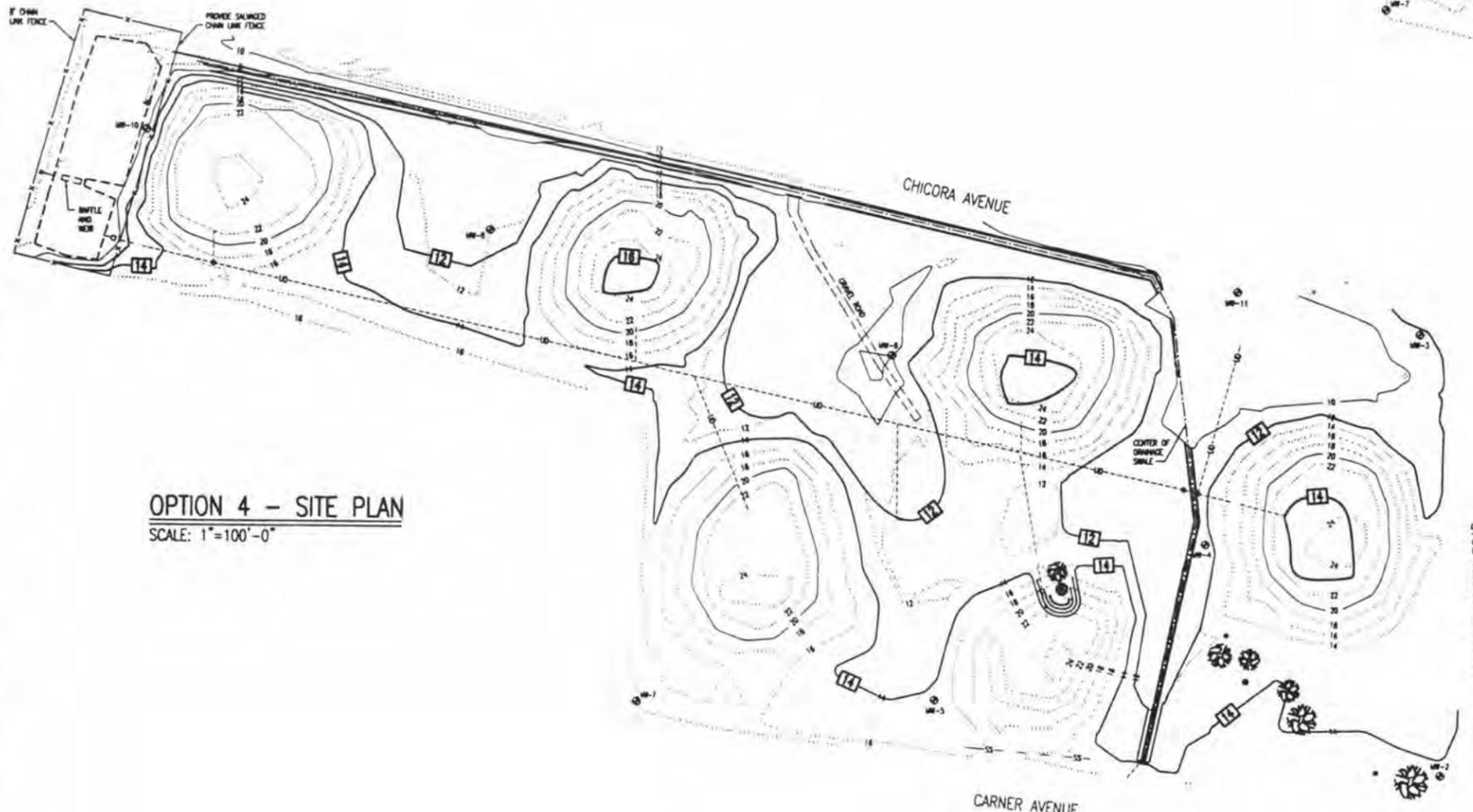


OPTION 3

DISCONNECT PIPE AND REMOVE ALL EQUIPMENT FROM THE PUMP PITS. REMOVE AND DISPOSE OF ALL VALVES ASSOCIATED WITH THE PIPING TO BE ABANDONED. PIG THE UNDERGROUND FUEL PIPING AND CLEAN ALL BELOW GRADE STRUCTURES. PROVIDE INERT MATERIAL TO FILL UNDERGROUND FUEL PIPING BETWEEN FUEL FARM AND BASE. EXCAVATE AND REMOVE ALL UNDERGROUND PIPING WITHIN THE FUEL FARM AND DISPOSE OF HAZARDOUS MATERIAL OFF-SITE. INCLUDES PARTIAL DEMOLITION OF FUEL STORAGE TANKS TO A LEVEL WHERE THE EARTH EXCAVATION WILL BE USED TO FILL THE REMAINING TANK VOLUME. THE EXCAVATION AND BACKFILL VOLUMES WILL BE BALANCED SO THAT THERE IS A MINIMUM AMOUNT OF FILL MATERIAL BROUGHT ON-SITE. REMOVE AND DISPOSE OF ABANDONED ELECTRICAL AND MECHANICAL SYSTEMS VISIBLE FROM ABOVE GRADE. REMOVE UTILITIES WITHIN STEAM AND TRANSFORMER BUILDINGS, DEMOLISH STEAM AND TRANSFORMER BUILDINGS, REMOVE STEAM AND CONDENSATE PIPING, REMOVE PERIMETER FENCE AND DISPOSE OF THE DEBRIS OFF-SITE.



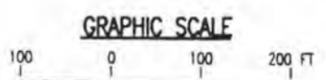
OPTION 3 - SITE PLAN
SCALE: 1"=100'-0"



OPTION 4 - SITE PLAN
SCALE: 1"=100'-0"

OPTION 4

INCLUDES ALL OF THE PROVISIONS STATED IN OPTION 3 EXCEPT THIS OPTION INVOLVES COMPLETE REMOVAL OF THE FUEL STORAGE TANKS AND DISPOSAL OF CONTAMINATED CONCRETE DEBRIS OFF-SITE.

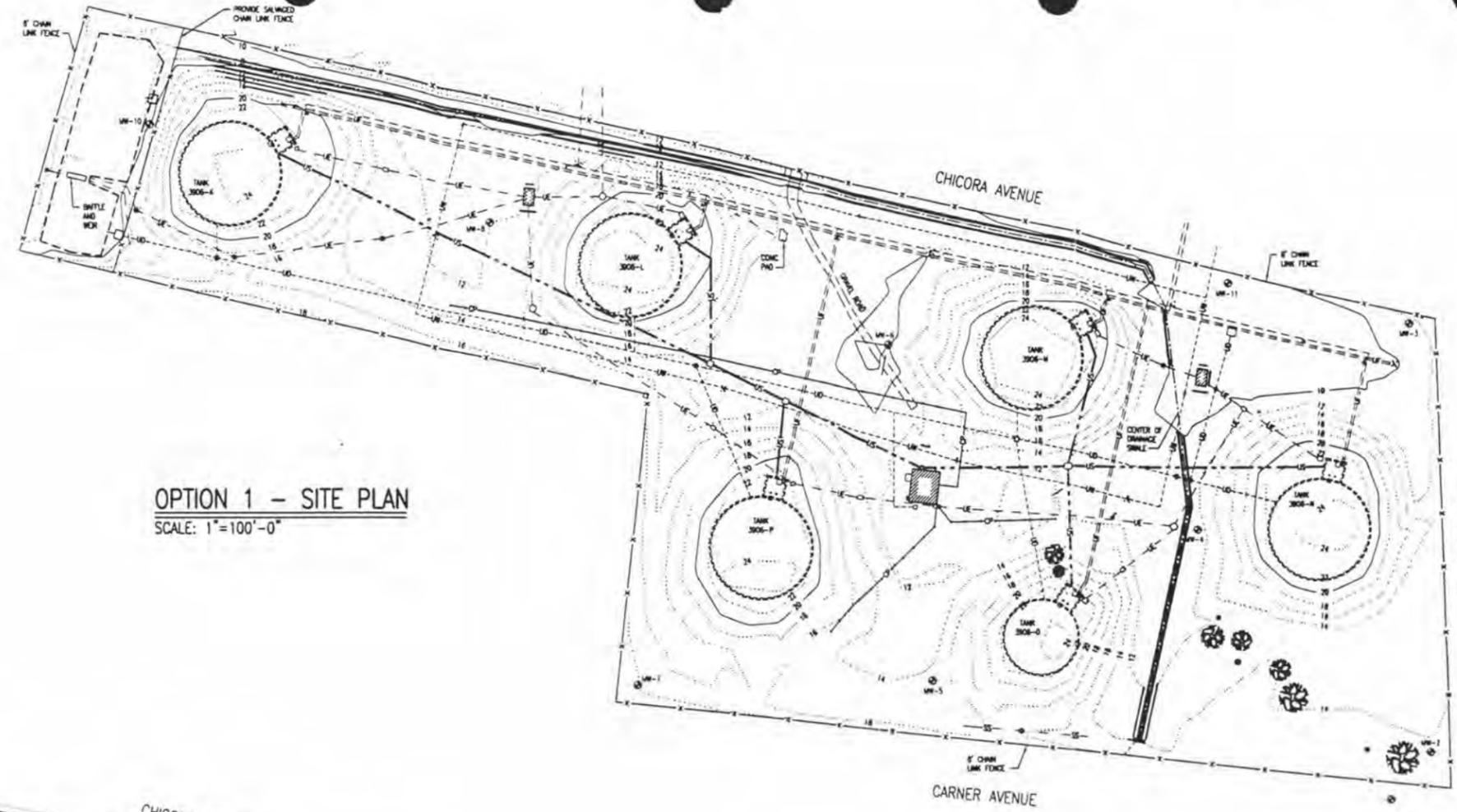


ENTERPRISE ENGINEERING, INC. ANCHORAGE, AK YARMOOUTH, ME USOR, YOUNG DR. BEANE, CRK. SUNN. CH ENGR. DATE: DR. NO. DNE	
APPROVED: _____ DATE: _____	OFFICER IN CHARGE: _____ DATE: _____
PREP BY: _____ DATE: _____	DESCRIPTION: _____
REV. _____ DESCRIPTION: _____	APPROVED: _____ DATE: _____
SOUTHERN DIVISION CHARLESTON, S.C. CHARLESTON SOUTH CHARLEM. DEMOLISH CHICORA TANK FARM OPTIONS 3 & 4 - SITE PLAN	ETD FOR COMMISSION: _____ APPROVED: _____
DEPARTMENT OF THE ARMY FLYING INDUSTRIAL SUPPLY CENTER	RECORD DRAWING DATE: _____ CODE D. NO. 80001 DRAWING SIZE: D CONSTRUCTION CONTROL NO.: _____

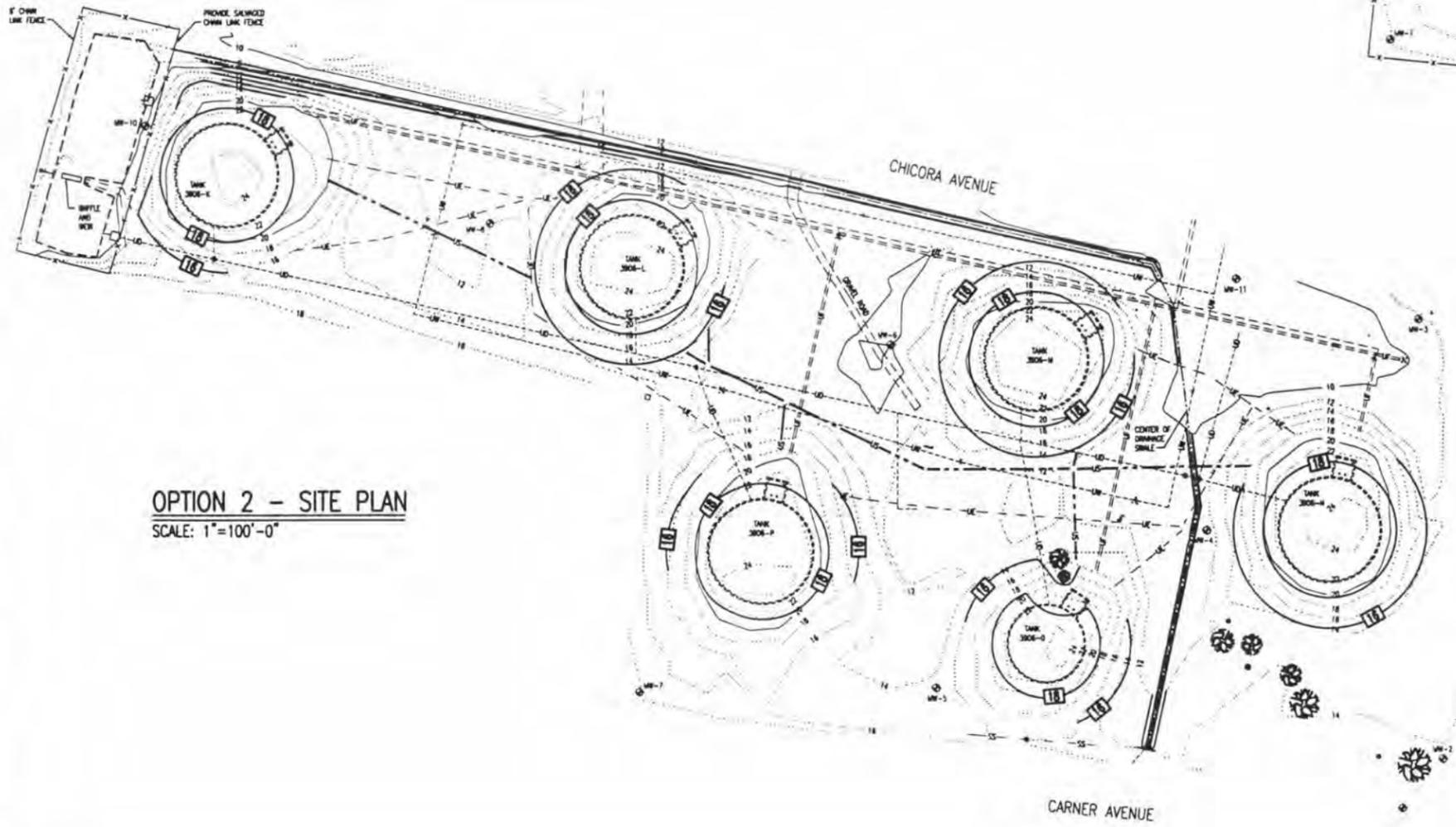


OPTION 1

REMOVE AND DISPOSE OF ALL VALVES ASSOCIATED WITH THE PIPE TO BE ABANDONED, PIG FUEL PIPELINES AND CLEAN UNDERGROUND STRUCTURES AND ABANDON IN PLACE. PROVIDE INERT MATERIAL TO FILL CONCRETE STRUCTURES BELOW GRADE AND ALL UNDERGROUND FUEL PIPING PRIOR TO ABANDONMENT. REMOVE ELECTRICAL AND MECHANICAL SYSTEMS VISIBLE FROM ABOVE GRADE. DISCONNECT ELECTRICAL SYSTEM IN STEAM AND TRANSFORMER BUILDINGS AND ABANDON THESE STRUCTURES. REMOVE THE LINED DITCH, REMOVE STORMDRAIN AND RETAIN THE PERIMETER FENCE IN ITS PRESENT CONDITION.



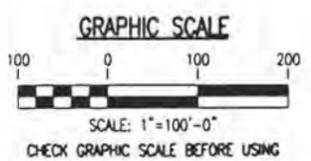
OPTION 1 - SITE PLAN
SCALE: 1"=100'-0"



OPTION 2 - SITE PLAN
SCALE: 1"=100'-0"

OPTION 2

INCLUDES ALL OF THE PROVISIONS STATED IN OPTION 1, BUT INCLUDES DEMOLITION OF THE FUEL STORAGE TANK AND PUMP PIT ROOFS, REMOVAL OF UTILITIES LOCATED WITHIN THE STEAM PITS, ELECTRICAL PITS AND TRANSFORMER BUILDINGS. IT ALSO INCLUDES DEMOLITION OF STEAM PLANT AND TRANSFORMER BUILDINGS, REMOVAL OF PERIMETER FENCING AND ON-SITE DISPOSAL OF NON-HAZARDOUS MATERIAL.

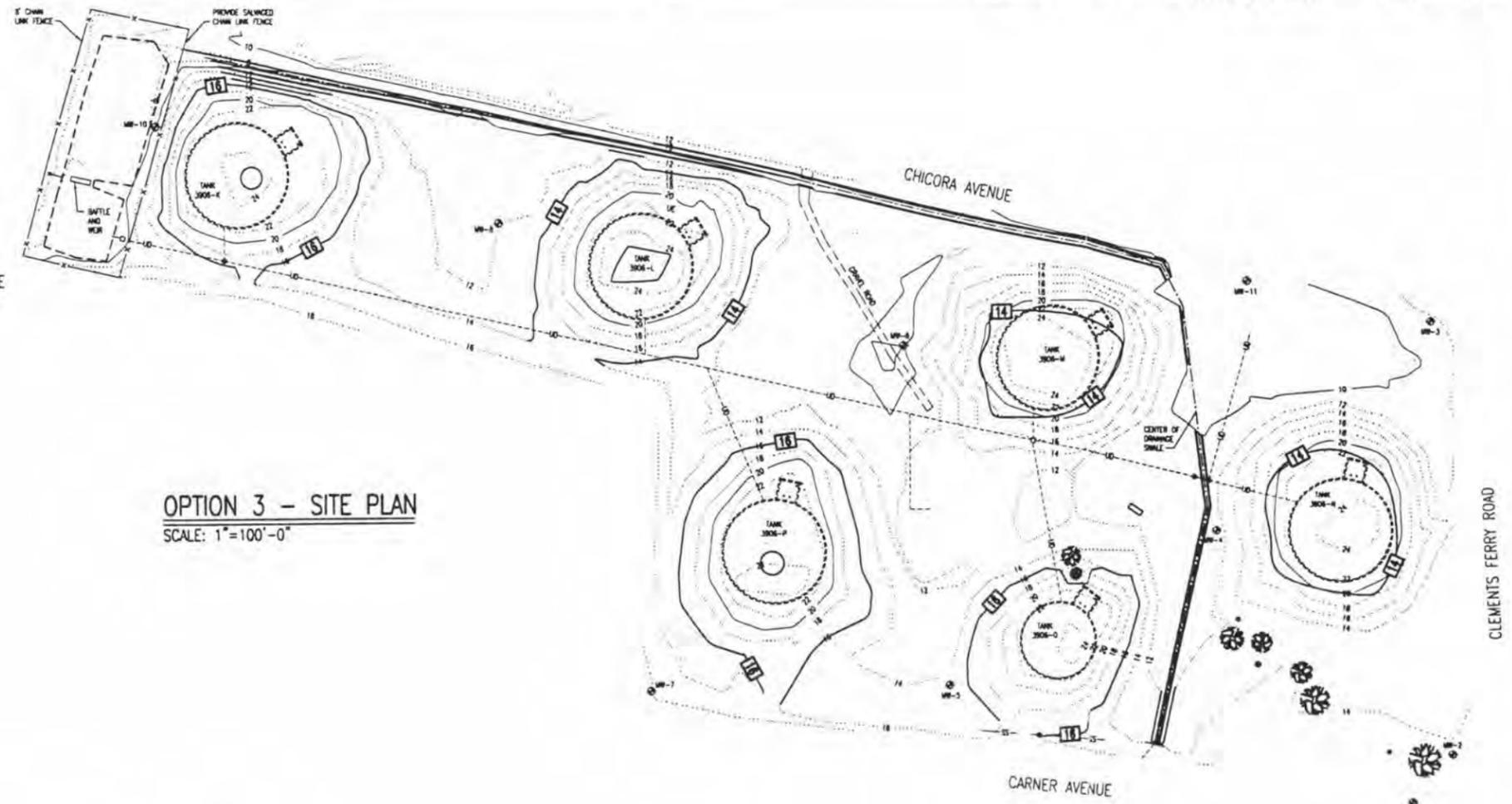


ENTERPRISE ENGINEERING, INC. ANCHORAGE, AK		YARMOUTH, ME DESER, YOUNG SUPP: SEC.	DR. BLAKE CH. DIXIE DATE:	DATE:
APPROV.	DATE	PREP. BY	DATE	OPTION IN CHARGE
REV.	DESCRIPTION	DATE	APPROVED	DATE
SOUTHERN DIVISION CHARLESTON, S.C.		MAIN FACILITIES ENGINEERING COMMAND CHARLESTON, SOUTH CAROLINA		
DEMOLISH CHICORA TANK FARM OPTIONS 1 & 2 - SITE PLAN		DTG FOR COMMAND, NMFFC		
RECORD DRAWING DATE	CODE ID, NO. ROOM	DRAWING SIZE: 0		
CONSTRUCTION CENTER NO.	NMFFC DRAWING NO.	SHEET 5 OF		
		5		

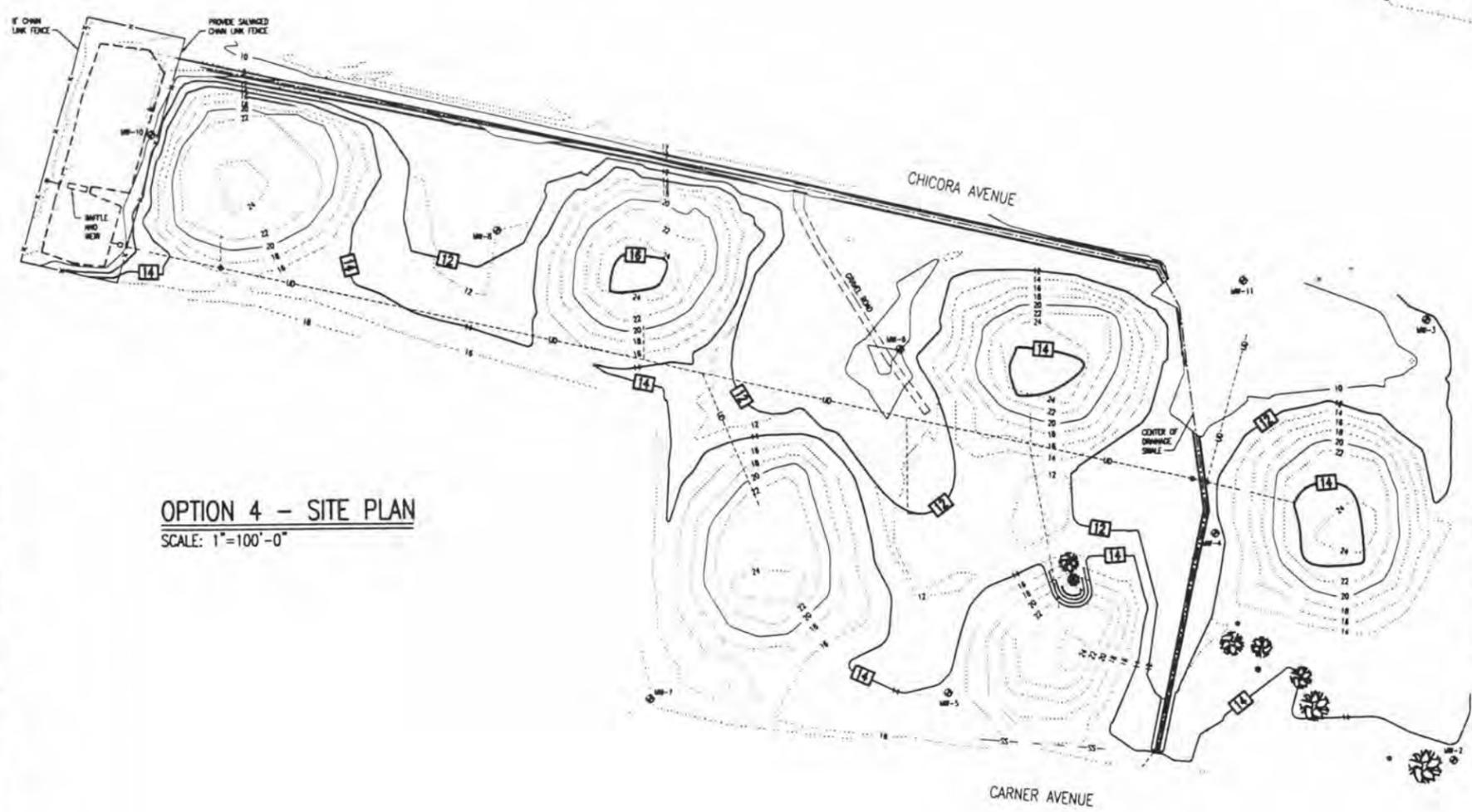


OPTION 3

DISCONNECT PIPE AND REMOVE ALL EQUIPMENT FROM THE PUMP PITS. REMOVE AND DISPOSE OF ALL VALVES ASSOCIATED WITH THE PIPING TO BE ABANDONED. PIG THE UNDERGROUND FUEL PIPING AND CLEAN ALL BELOW GRADE STRUCTURES. PROVIDE INERT MATERIAL TO FILL UNDERGROUND FUEL PIPING BETWEEN FUEL FARM AND BASE. EXCAVATE AND REMOVE ALL UNDERGROUND PIPING WITHIN THE FUEL FARM AND DISPOSE OF HAZARDOUS MATERIAL OFF-SITE. INCLUDES PARTIAL DEMOLITION OF FUEL STORAGE TANKS TO A LEVEL WHERE THE EARTH EXCAVATION WILL BE USED TO FILL THE REMAINING TANK VOLUME. THE EXCAVATION AND BACKFILL VOLUMES WILL BE BALANCED SO THAT THERE IS A MINIMUM AMOUNT OF FILL MATERIAL BROUGHT ON-SITE. REMOVE AND DISPOSE OF ABANDONED ELECTRICAL AND MECHANICAL SYSTEMS VISIBLE FROM ABOVE GRADE. REMOVE UTILITIES WITHIN STEAM AND TRANSFORMER BUILDINGS, DEMOLISH STEAM AND TRANSFORMER BUILDINGS, REMOVE STEAM AND CONDENSATE PIPING, REMOVE PERIMETER FENCE AND DISPOSE OF THE DEBRIS OFF-SITE.



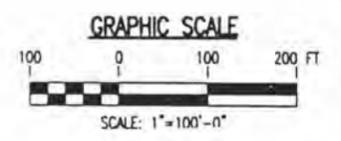
OPTION 3 - SITE PLAN
SCALE: 1"=100'-0"



OPTION 4 - SITE PLAN
SCALE: 1"=100'-0"

OPTION 4

INCLUDES ALL OF THE PROVISIONS STATED IN OPTION 3 EXCEPT THIS OPTION INVOLVES COMPLETE REMOVAL OF THE FUEL STORAGE TANKS AND DISPOSAL OF CONTAMINATED CONCRETE DEBRIS OFF-SITE.

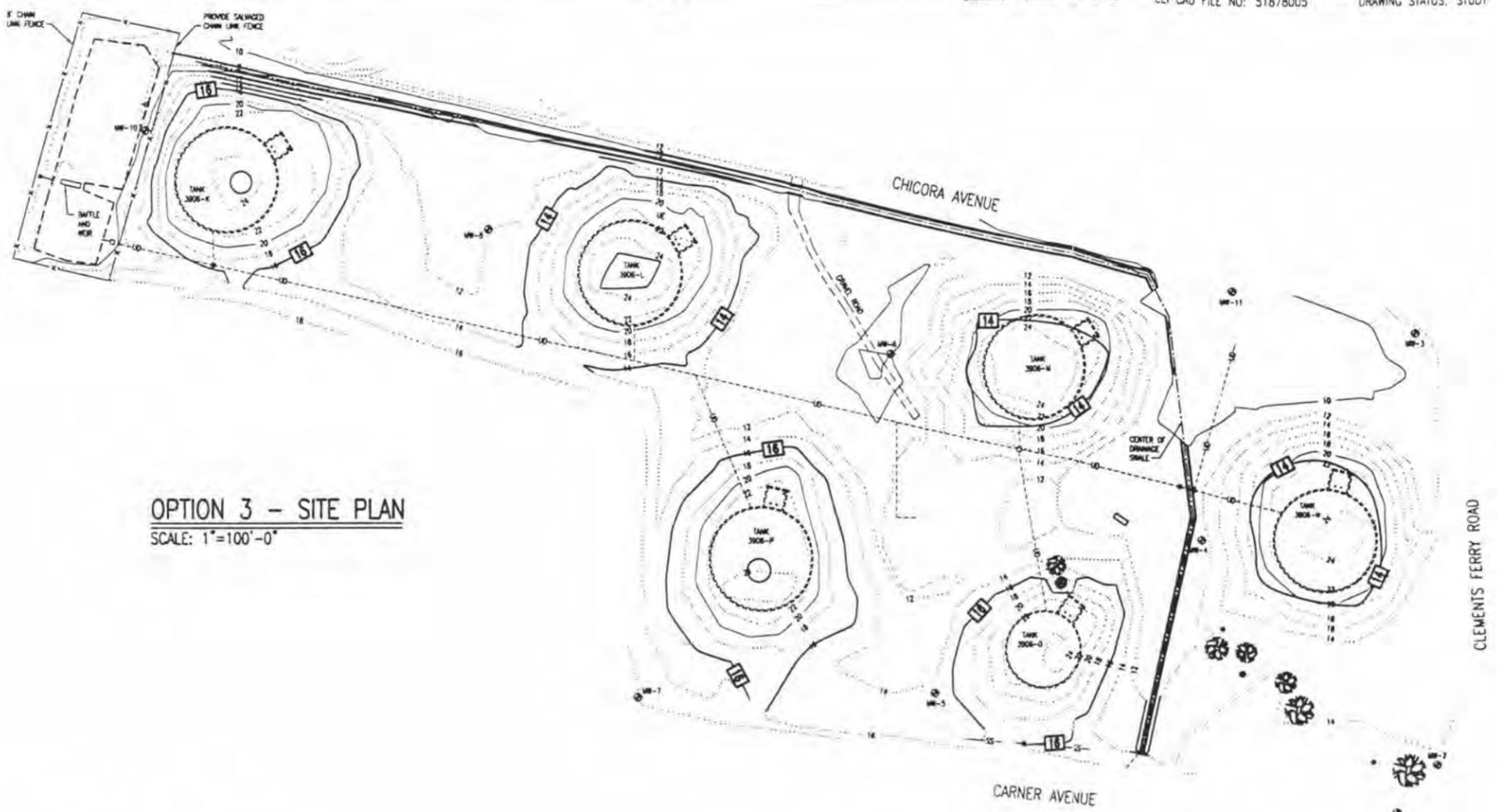


ENTERPRISE ENGINEERING, INC. ANCHORAGE, AK		APPROV DATE
HANGOUTH, ME DESOR YOUNG DR BEANE CHC	PREP BY DATE	OFFICE IN CHARGE DATE
SUPP SUBM BY:	DATE	DR NO:
DC:	DATE	DR NO:
APPROVED:	DATE:	APPROVED:
DEPARTMENT OF THE ARMY SOUTHERN DIVISION CHARLESTON, S.C.	CIVIL FACILITIES DESIGNING COMMAND CHARLESTON, SOUTH CAROLINA	ETD FOR COMMANDER, 38742
DEMOLISH CHICORA TANK FARM OPTIONS 3 & 4 - SITE PLAN		
RECORD DRAWING DATE	CODE ID: 80001	DRAWING SIZE: 0
CONSTRUCTION CONTROL NO.	NAVIAC DRAWING NO.	DATE:

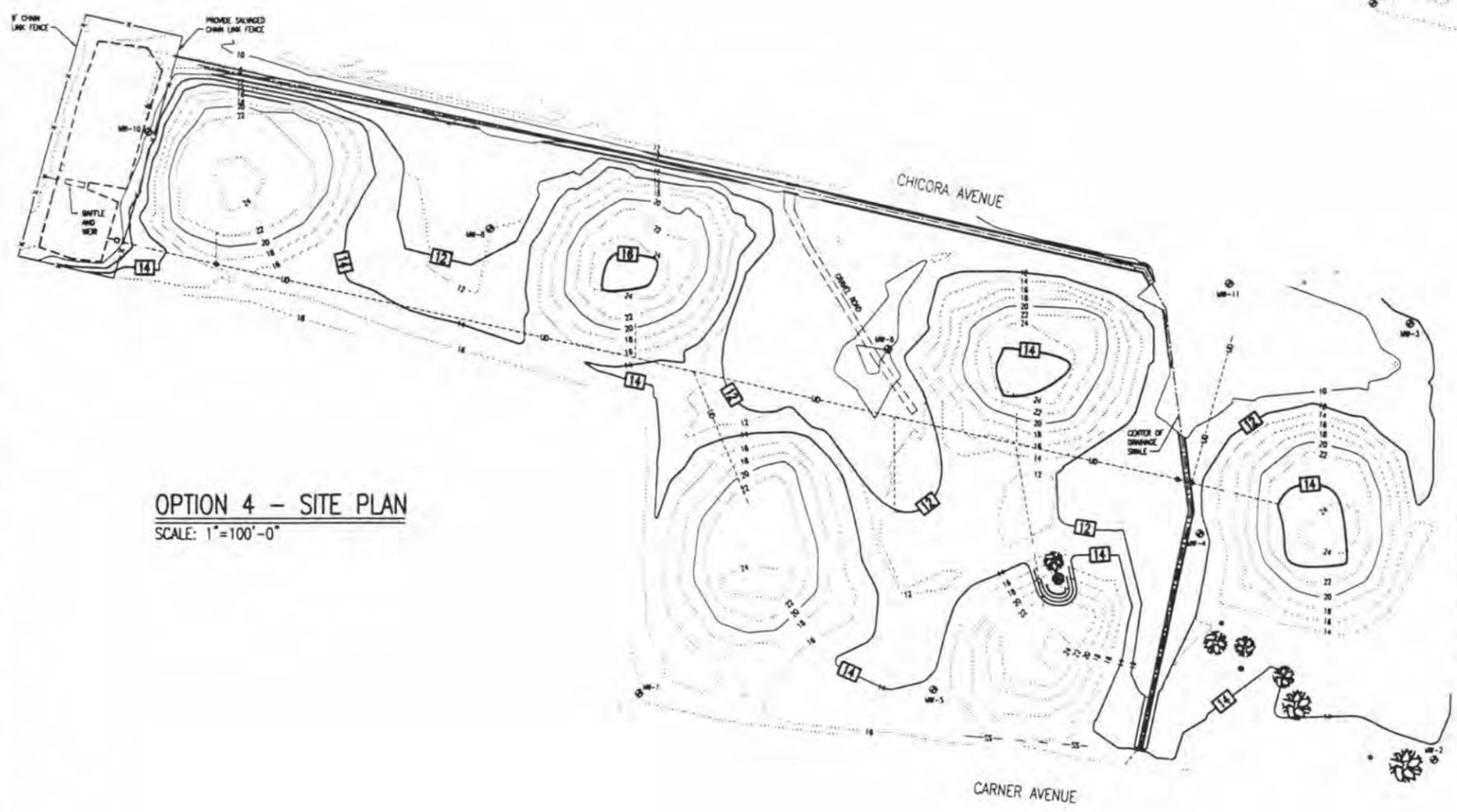


OPTION 3

DISCONNECT PIPE AND REMOVE ALL EQUIPMENT FROM THE PUMP PITS. REMOVE AND DISPOSE OF ALL VALVES ASSOCIATED WITH THE PIPING TO BE ABANDONED. PIG THE UNDERGROUND FUEL PIPING AND CLEAN ALL BELOW GRADE STRUCTURES. PROVIDE INERT MATERIAL TO FILL UNDERGROUND FUEL PIPING BETWEEN FUEL FARM AND BASE. EXCAVATE AND REMOVE ALL UNDERGROUND PIPING WITHIN THE FUEL FARM AND DISPOSE OF HAZARDOUS MATERIAL OFF-SITE. INCLUDES PARTIAL DEMOLITION OF FUEL STORAGE TANKS TO A LEVEL WHERE THE EARTH EXCAVATION WILL BE USED TO FILL THE REMAINING TANK VOLUME. THE EXCAVATION AND BACKFILL VOLUMES WILL BE BALANCED SO THAT THERE IS A MINIMUM AMOUNT OF FILL MATERIAL BROUGHT ON-SITE. REMOVE AND DISPOSE OF ABANDONED ELECTRICAL AND MECHANICAL SYSTEMS VISIBLE FROM ABOVE GRADE. REMOVE UTILITIES WITHIN STEAM AND TRANSFORMER BUILDINGS, DEMOLISH STEAM AND TRANSFORMER BUILDINGS, REMOVE STEAM AND CONDENSATE PIPING, REMOVE PERIMETER FENCE AND DISPOSE OF THE DEBRIS OFF-SITE.



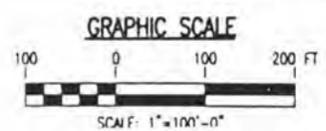
OPTION 3 - SITE PLAN
SCALE: 1"=100'-0"



OPTION 4 - SITE PLAN
SCALE: 1"=100'-0"

OPTION 4

INCLUDES ALL OF THE PROVISIONS STATED IN OPTION 3 EXCEPT THIS OPTION INVOLVES COMPLETE REMOVAL OF THE FUEL STORAGE TANKS AND DISPOSAL OF CONTAMINATED CONCRETE DEBRIS OFF-SITE.



ENTERPRISE ENGINEERING, INC. ANCHORAGE, AK		YANAGUCHI, ME USUR, YOUNG DR. BEANE, CHK. SUPP. CH. ENGR. DATE: SUBM. BY: EC. DR. NO. DE. DATE:
APPROVED:	OFFICE IN CHARGE:	DATE:
PREP BY:	DATE:	APPROVED:
DESCRIPTION:	REV.	APPROVED:
SOUTHERN DIVISION CHARLESTON, S.C.	MAIN FACILITIES ENGINEERING COMMAND CHARLESTON, SOUTH CAROLINA	DATE:
DEMOLISH CHICORA TANK FARM OPTIONS 3 & 4 - SITE PLAN		
RECORD DRAWING DATE:	CODE CL. NO. 80081	DRAWING SIZE: D
CONSTRUCTION CENTER NO.	WORKING DRAWING NO.	APPROVED:

KEMRON
ENVIRONMENTAL SERVICES

Chicora
TF

1815 Century Boulevard ■ Suite 150 ■ Atlanta, Georgia 30345 ■ (404) 636-0928 ■ FAX: (404) 636-7162

Project 819-300

8 May 1990

Mr. Robert C. Thames
Director of Buildings and Grounds
Charleston County School District
2100 Leeds Avenue
Charleston, South Carolina 29405

Dear Mr. Thames:

On behalf of the U.S. Navy, Southern Division, Naval Facilities Engineering Command, this letter requests permission to install a groundwater monitoring well on the playground of the Norman C. Toole Middle School, located on Carner Avenue (Highway 52) in North Charleston, South Carolina. We have recently conducted a soil-gas survey at the Chicora Tank Farm, located east and south of the middle school and have found organic vapors suggestive of fuel contamination near the middle school property line. As a result of a discussion with the South Carolina Department of Health and Environmental Control (DHEC), we feel that installation and sampling of a monitoring well on the grounds of the Norman C. Toole Middle School is required to determine potential suspected impacts from fuel leakage at the Chicora Tank Farm. (Ten other wells will be installed on Naval property throughout the tank farm area.) The proposed monitoring well will be constructed such that the locked protective cover of the well will be flush mounted with the surrounding ground surface to create no surface obstructions. A Monitoring Well Schematic showing proposed well construction details is attached to this document. We can arrange to install the well after school hours or on a weekend as may be required by the Charleston School System and will, of course, coordinate with your office regarding scheduling.

Attached is a scaled blue-print of the site showing our proposed monitoring well location on the playground. Also attached is a copy of the Charleston Quadrangle 7.5 minute topographic map showing locations of the Norman C. Toole Middle School and the Chicora Tank Farm.

RECEIVED

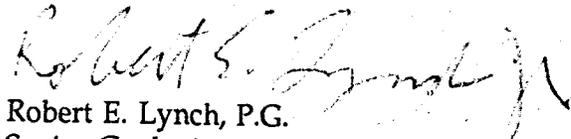
MAY 11 1990

GROUNDWATER
PROTECTION DIVISION

Mr. Robert C. Thames
8 May 1990
Page 2

We would be pleased to submit further data if required. Your expeditious review and channeling of this request will be greatly appreciated. Please do not hesitate to contact Mr. Kurt Hausner of my staff at (404) 636-0928 if you have any questions or comments concerning this matter.

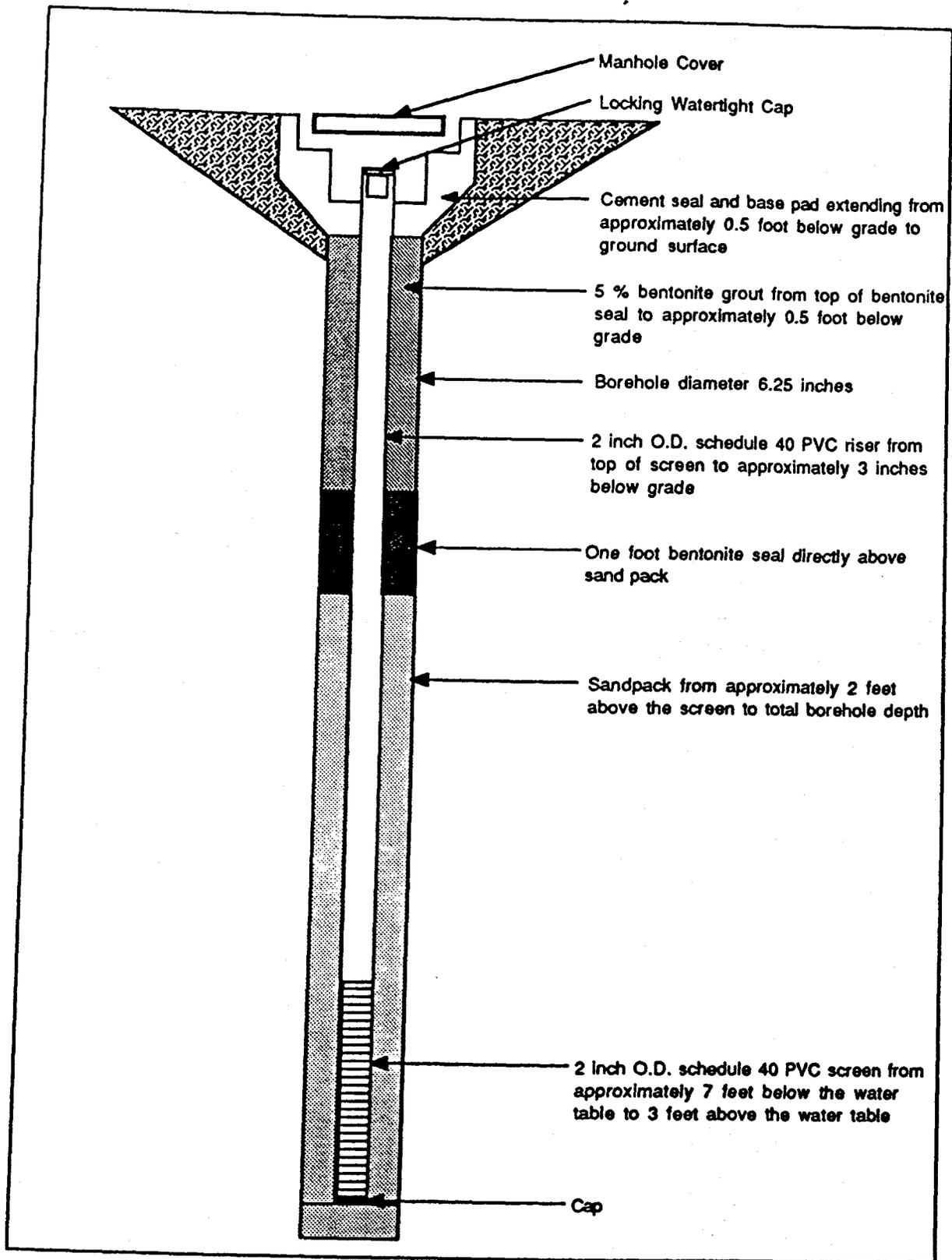
Sincerely,


Robert E. Lynch, P.G.
Senior Geologist

Enclosures

cc: E.R. Batten, NAVFAC ENGCOR w/o Enclosures
David Baize, DHEC w/o Enclosures

KH:ltr819.sch
5/8/90



Flush mounted monitoring well schematic

7/11



Monitoring Well Approval

Approval is hereby granted to: Kemron Environmental Services
1815 Century Blvd., Suite 150
Atlanta, GA 30345

RE: Chicora Tank Farm
Charleston County

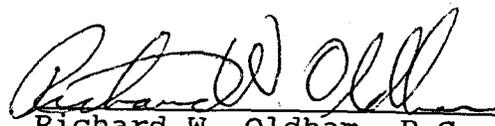
for the construction of monitoring wells designated MW-1 to MW-11
in accordance with the construction plans and specifications
submitted on April 16, 1990.

These wells will be constructed to the approximate depth of 15 feet
below the surface and screened in the surficial aquifer for the
purpose of monitoring ground-water quality.

Conditions: That the latitude and longitude and actual
construction details for each well be submitted within 30 days
after installation. That the analytical results be submitted
within 30 days of receipt of laboratory results.

This approval is pursuant to the provisions of Section 44-55-40 of
the 1976 South Carolina Code of Laws and the Department of Health
and Environmental Control Regulations R.61-71.

Date of Issue April 24, 1990.


Richard W. Oldham, P.G., Manager
Assessment and Development Section
Ground-Water Protection Division
Bureau of Drinking Water Protection

DB/sa

DB1448
0424901448/DB

cc: Trident EQC District, Christine Sanford

Kurt Hausner, Kemron Environmental

KEMRON

ENVIRONMENTAL SERVICES

1815 Century Boulevard ■ Suite 150 ■ Atlanta, Georgia 30345 ■ (404) 636-0928 ■ FAX: (404) 636-7162

11 April 1990

Mr. David Baize
Department of Health
and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

*5 submitted
April 16, 1990
at meeting*

Dear Mr. Baize:

Preliminary contamination assessment activities at the Chicora Tank Farm in Charleston, South Carolina were initiated on 27 March 1990. The soil-gas survey and Tracer survey have been completed. This document is to serve as notification of intent to install eleven soil borings and monitoring wells at the Chicora Tank Farm site, as described in the Preliminary Contamination Plan.

*SC
Certified
YES!*

The Chicora Tank Farm houses six subsurface fuel storage tanks (five 50,000 bbl and one 27,000 bbl) on a completely fenced site covering approximately 23 acres. The tanks are approximately 25 feet in height and are situated so that approximately one-half of each is below grade. The site was regraded following installation of the tanks so that each was covered with soil (3 - 5 feet thick at the Apex); each tank is now buried inside its own grassy hillock. Tank locations are shown on Figure 1.

A soil-gas survey was performed at the site from 27 February to 9 March 1990. Few detections above 10 ppm were noted. A map showing soil-gas sample locations and results is presented in Figure 2.

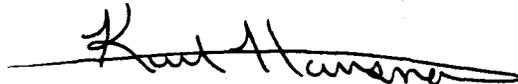
Eleven monitoring wells are to be installed throughout the site by a South Carolina certified drilling contractor. The monitoring wells will be advanced to a depth approximately seven feet below the existing water table. Borings will be advanced by a truck mounted drill rig using 6 1/4-inch O.D. hollow stem augers. Cuttings and soil samples retrieved from each borehole will be monitored in the field with a photo-ionization detector for organic vapors. Soil sampling will be performed in general accordance with ASTM D 1586. A standard 1.4-inch I.D., 2-inch O.D., split barrel stainless steel sampler will be used. The sampler will be first seated six inches into the ground to penetrate loose cuttings, and subsequently driven an additional foot with blows from a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the final foot will be recorded. Soils, when removed from the sampler will be inspected for soil characteristics, which will be recorded on borehole-specific logs. All equipment coming in contact with the soil will be decontaminated by steam cleaning between boreholes.

Monitoring wells will be installed in each of the soil borings described above. Initially, auger flights used to drill each borehole will remain in place to prevent the boring walls from collapsing. Two-inch diameter schedule 40 PVC screen and riser pipe will be installed into each borehole. Approximately 10 feet of screen with 0.01 inch slots will be placed into each borehole such that approximately three feet will extend above and seven feet will extend below the

groundwater table at the time of drilling (screen and riser lengths may be adjusted if an unexpectedly high or low water table is encountered). Riser pipe will be added to the screen section to set each well either approximately three feet above the ground surface or flush mounted with the ground surface. A tremie pipe will be used to backfill the annular space adjacent to the screen section with a sand pack. The augers will be pulled up as sand is tremied into the annular space. This sand pack will extend approximately two feet above the screened interval. The one foot annular space interval directly above the sand pack will be filled with bentonite pellets and water to form an expansive seal. A 5% bentonite grout will be sequentially tremied into the annular space extending from the top of the bentonite seal to one foot below the ground surface. Quantities and depths of sand and bentonite fill may be smaller if the water table is extremely high. Portland cement will be poured into the annular space and filled to approximately six inches below grade. A cement pad, extending to a depth of six inches below grade and six inches beyond the borehole diameter will be installed around each well. The cement pad will serve to prevent infiltration between the surface casing and the borehole. Stick-up or flush-mounted protective casings will be placed over each well as an added security measure. The wells will be completed with a locking plastic cap placed on the riser pipe. Cross-sectional diagrams, showing monitoring well construction details are presented in Figures 3 and 4. Proposed monitoring well locations are shown on Figure 5.

Expeditious review of proposed monitoring well locations would be appreciated. Installation activities will begin upon receipt of DHEC's comments. Please feel free contact either myself or Mr. Reece Batten of SouthDiv if you have any questions or comments concerning this submittal.

Sincerely,

A handwritten signature in black ink, appearing to read "Kurt Hausner", written over a horizontal line.

Kurt D. Hausner
Geologist

cc: Reece Batten

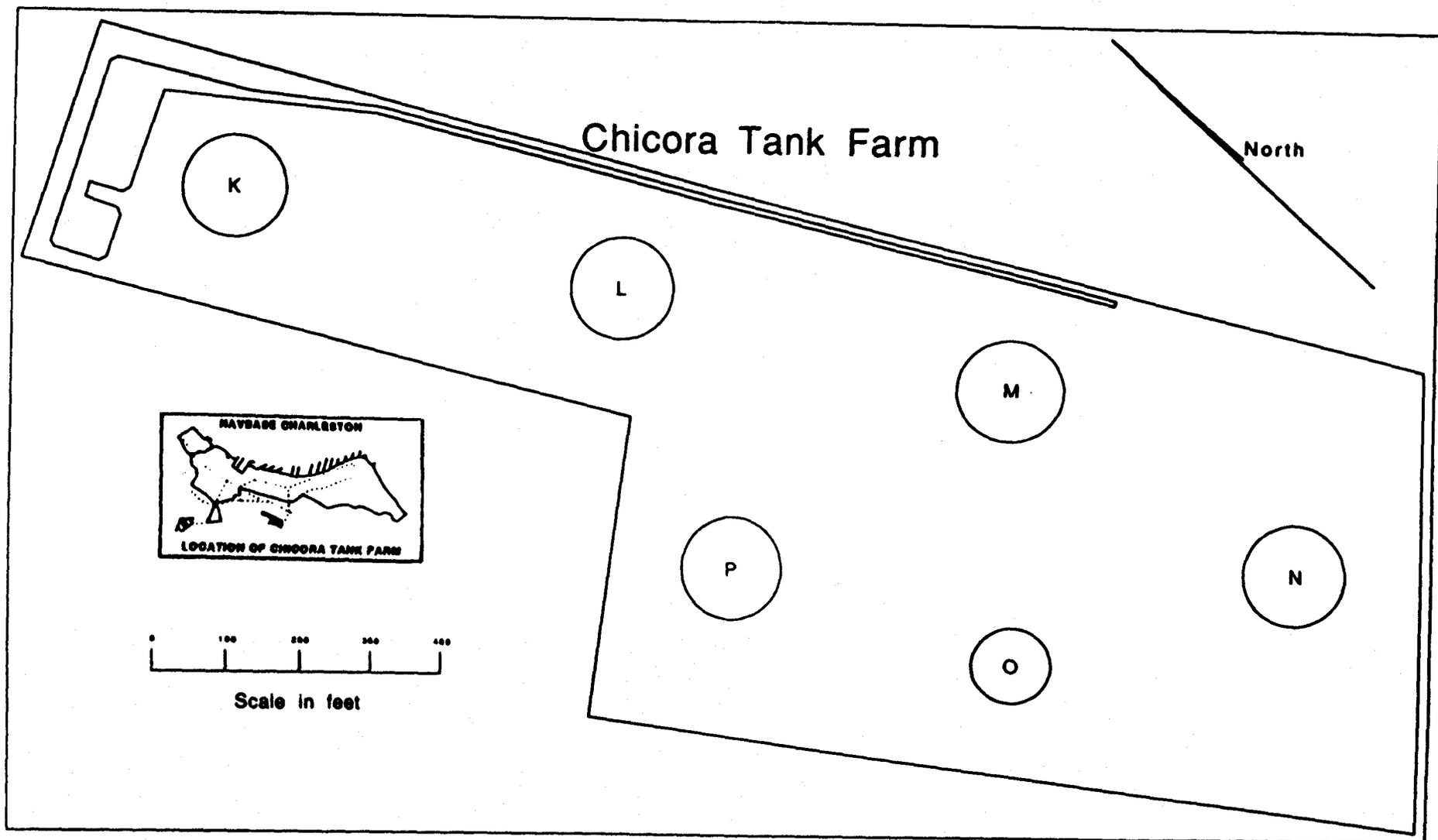


Figure 1. Site Map

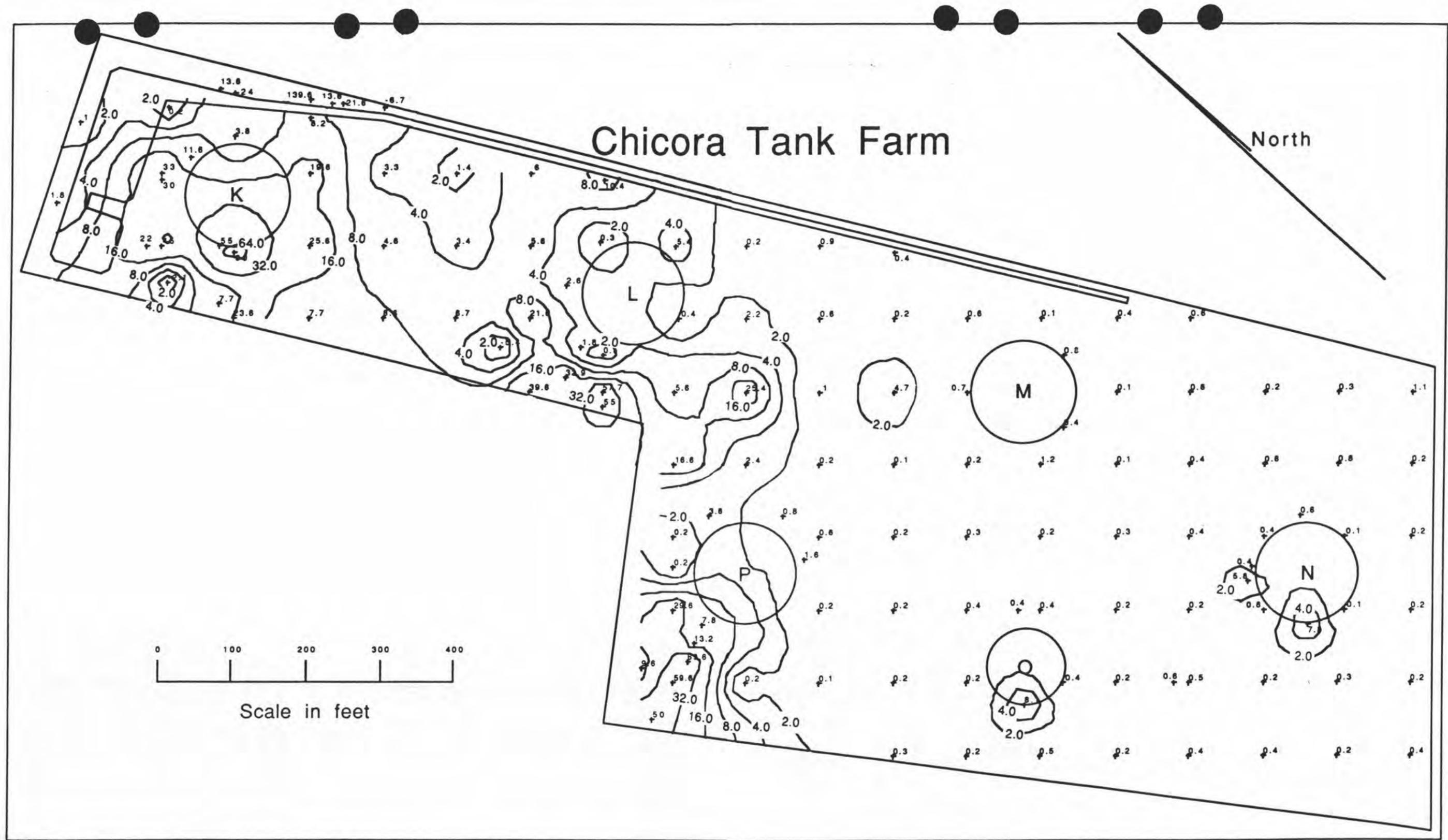


Figure 2. Organic Vapor Contour Map; Source: Soil-Gas Survey

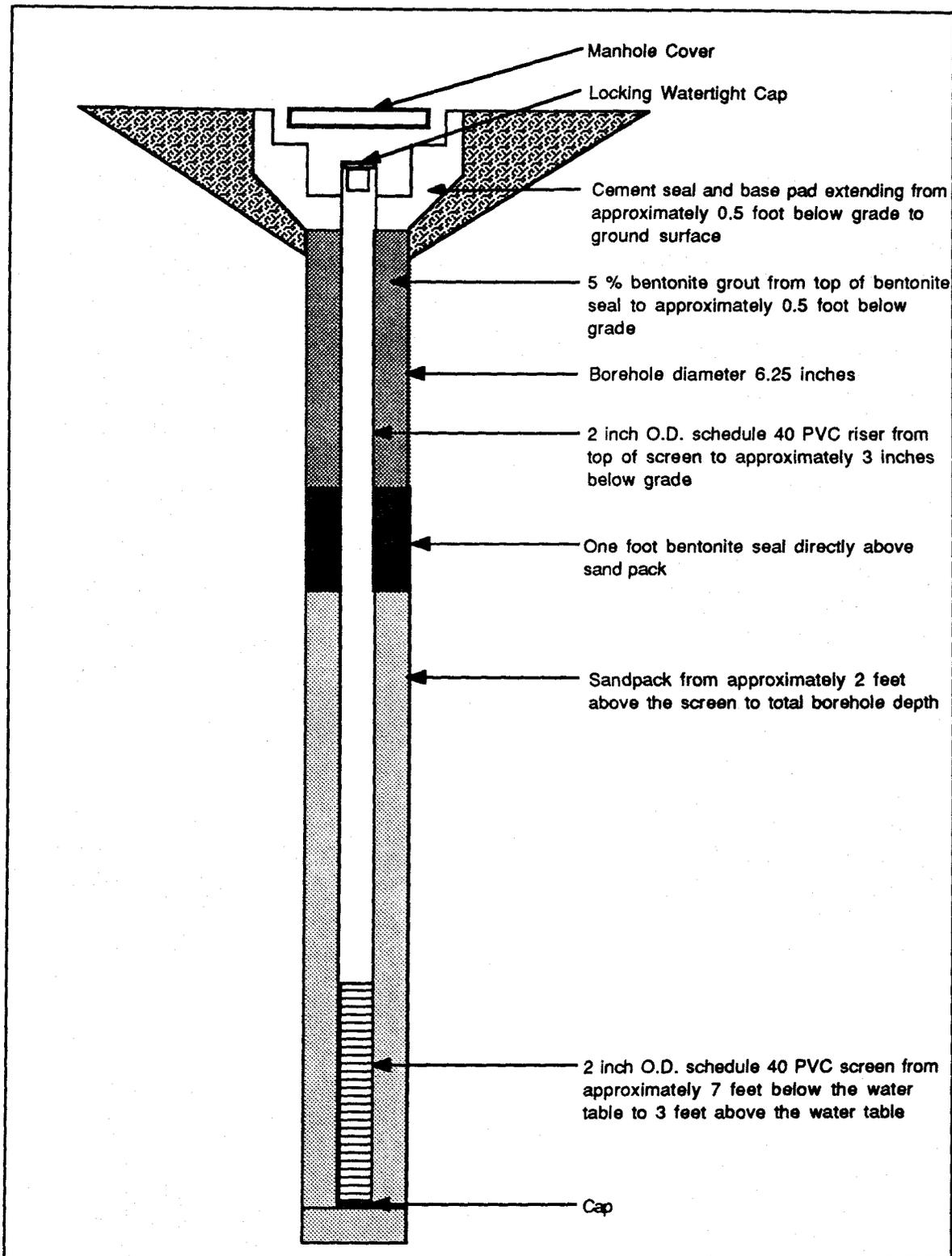


Figure 3. Flush mounted monitoring well schematic

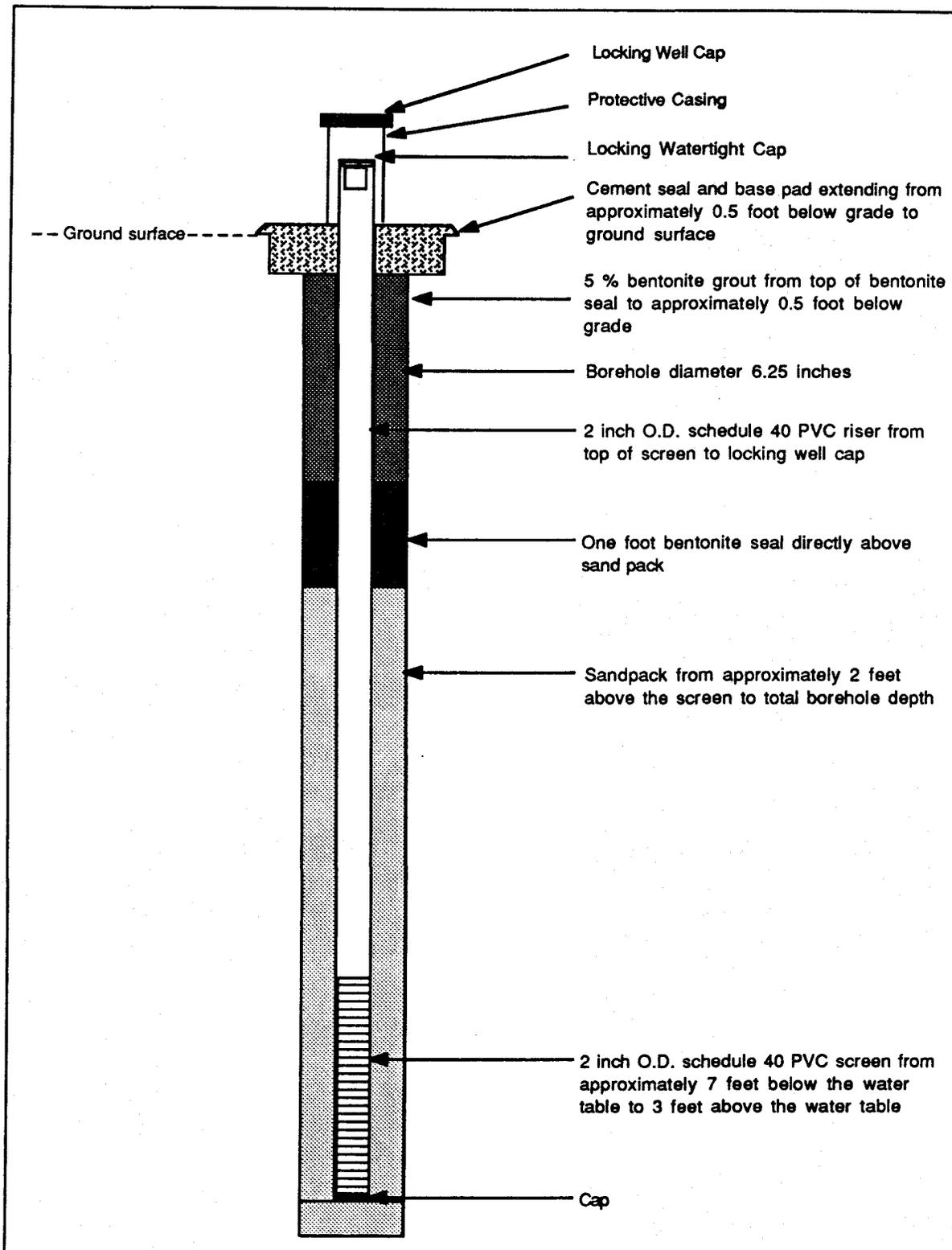


Figure 4. Stick-up monitoring well schematic

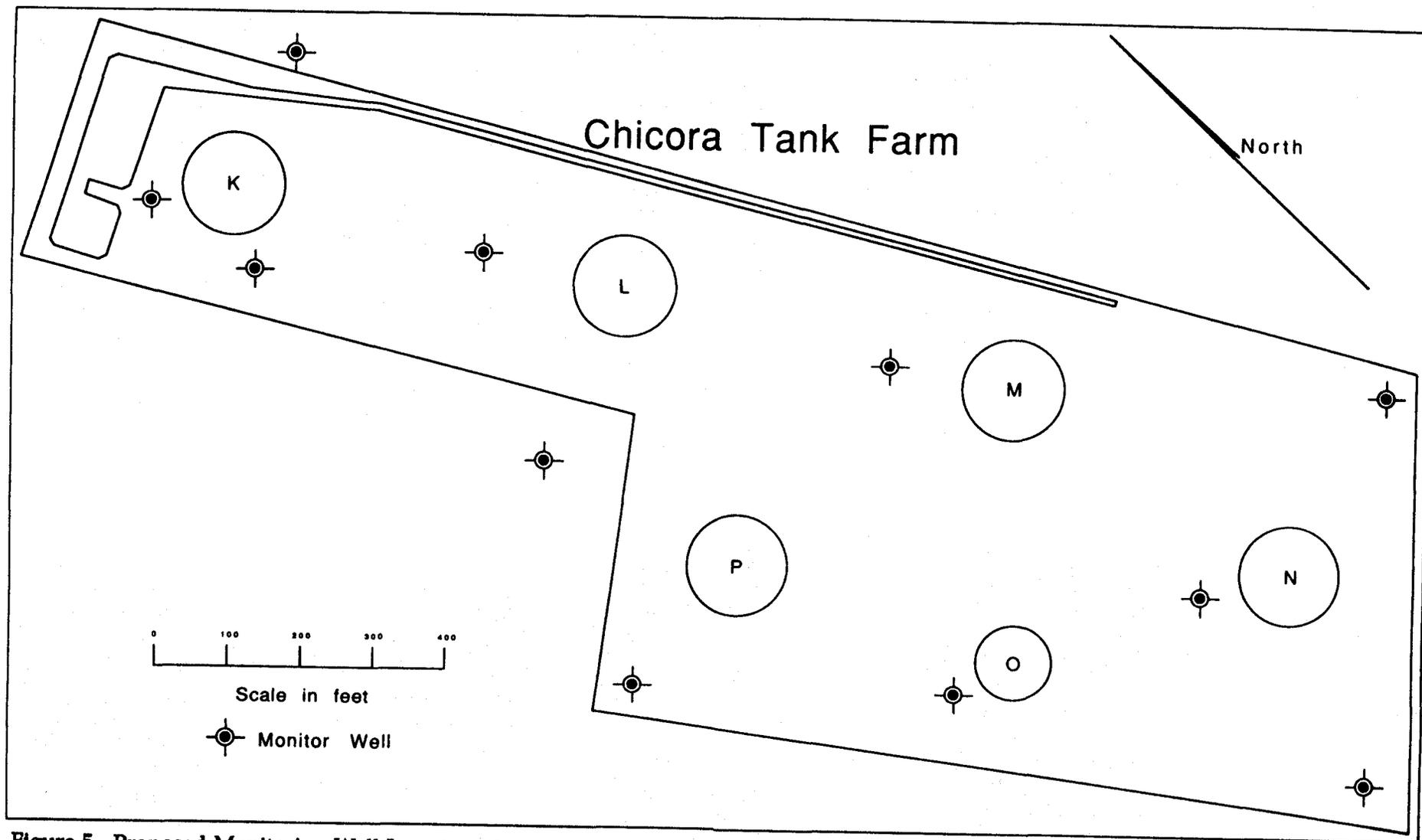


Figure 5. Proposed Monitoring Well Location Map



DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

2155 EAGLE DR., P. O. BOX 10068

CHARLESTON, S. C. 29411-0068

PLEASE ADDRESS REPLY TO THE
COMMANDING OFFICER, NOT TO
THE SIGNER OF THIS LETTER.
REFER TO:

5090

Code 11521/13

23 FEB 1990

Mr. David Baize
Department of Health and Environmental Control
Groundwater Protection Division
2600 Bull Street
Columbia, South Carolina 29201

PRELIMINARY CONTAMINATION ASSESSMENT PLAN FOR CHICORA TANK FARM, CHARLESTON,
SOUTH CAROLINA

Dear Mr. Baize:

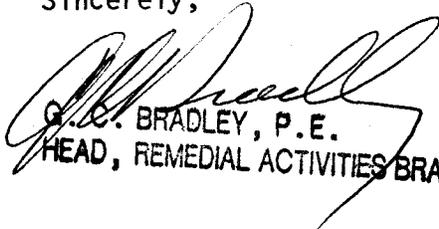
As requested in your 12 February 1990 letter, copies of the Preliminary Contamination Assessment Plan (PCAP) have been provided for your review and comment by the Kemron Environmental Services letter dated 5 February 1990. As discussed between you and our Mr. Reece Batten on 9 February 1990, and as stated in our letter to Mr. Wayne Fanning dated 3 July 1989, documents from our investigation will be provided as they become available.

In order to implement the contamination assessment for this project, we request your PCAP response by 5 March 1990.

The PCAP indicates that the location of the 11 wells will be based on field-gathered soil gas and TRACER Probes. The wells' location points will be provided to you for your review and comments as planned. When you receive the well location points, please provide your comments within ten days in order to continue with the contamination assessment.

Please contact Mr. Reece Batten at (803) 743-0578 if you have any questions.

Sincerely,


G.C. BRADLEY, P.E.
HEAD, REMEDIAL ACTIVITIES BRANCH

RECEIVED

FEB 26 1990

GROUNDWATER
PROTECTION DIVISION

South Carolina Department of Health and Environmental Control

File

2600 Bull Street
Columbia, S.C. 29201

Commissioner
Michael D. Jarrett



Board
Henry S. Jordan, M.D., Chairman
John B. Pate, M.D., Vice-Chairman
William E. Applegate, III, Secretary
Toney Graham, Jr., M.D.
John H. Burriss
Richard E. Jabbour, D.D.S.
Currie B. Spivey, Jr.

February 20, 1990

Mr. Reese Batten
Southern Division
2155 Eagle Drive
P.O. Box 10068
Charleston, SC 29411

Re: Chicora Tank Farm
Marine Corps Air Station - IRP Site
Preliminary Contamination Assessment Plan
(submitted February 13, 1990)
Charleston County

Dear Mr. Batten:

The referenced assessment plan has been reviewed, and the following comments are provided:

- 1) Apparently, the proposed tracer survey has been initiated. The concentration of the tracer (10 ppm) is stated, but the chemical constituents of the "signature compound" used is not given. The type of tracer used should be clarified, and it should be noted that injection of the tracer without prior approval may be a violation of S.C. Underground Injection Control (UIC) regulations (contact Mr. Stanley Swartzel, 734-4613 for additional details).
- 2) A soil-gas survey is proposed to be performed over the entire area of the site. Eleven soil borings/monitor wells are proposed for the areas determined to have the highest PID readings from the soil-gas survey. This approach is approvable.

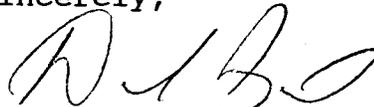
The monitor wells should be installed per the S.C. Well Standards and Regulations (R.61-71.11). A copy is enclosed for your information. The narrative description of the proposed well installation procedures appear to meet regulations (except for the cement surface pad), but a cross-sectional diagram showing the monitor well construction details must be submitted. It should also be noted that a S.C. certified well driller is required to install the monitor wells.

Mr. Batten
February 20, 1990
Page 2

- 3) Please submit the results of the soil gas survey (our fax number is 734-4661) when they are available, with a site map showing the PID readings and the proposed monitor well locations. The monitor well approval will be issued as expeditiously as possible after Departmental review and concurrence on the well locations have been reached (and the additional information from comment #2 has been submitted).
- 4) The cover of the referenced report states that the MCAS is the responsible party for this site, and not the Charleston Naval Shipyard. Please provide the name and address of the responsible party of the Chicora Tank Farm, along with the name of the person who is the military point of contact for this site.
- 5) Please submit an implementation schedule for the proposed activities (when the soil-gas survey is scheduled, and when the assessment report will be submitted).

In general, this proposal appears to outline an appropriate methodology for an initial assessment of this site, and will be approvable when the requested additional information is received. If you have any questions, please call me at (803) 734-5329.

Sincerely,



David G. Baize, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division
Bureau of Drinking Water Protection

DGB/CHIC

Enclosure

cc: Victor Weeks
U.S. EPA Region IV

Kurt Hausner
KEMRON Environmental

Trident District EQC

South Carolina Department of Health
and Environmental Control

File

2600 Bull Street
Columbia, S.C. 29201

Commissioner
Michael D. Jarrett



Board
Henry S. Jordan, M.D., Chairman
John B. Pate, M.D., Vice-Chairman
William E. Applegate, III, Secretary
Toney Graham, Jr., M.D.
John H. Burriss
Richard E. Jabbour, D.D.S.
Currie B. Spivey, Jr.

February 12, 1990

Mr. Herb Fraser
Southern Division - Code 1152
2155 Eagle Dr.
P.O. Box 10068
Charleston, SC 29411-0068

Re: Chicora Tank Farm
Naval Supply Center, Charleston Naval Shipyard
Charleston County

Dear Mr. Fraser:

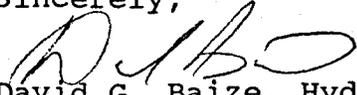
Per a phone conversation with Mr. Reese Batten of your office on February 9, 1990, a hydrogeologic assessment at the referenced facility has been initiated without Departmental approval.

In a letter to Mr. Wayne Fanning from Mr. J.B. Malone, dated July 3, 1989, it was stated that "SOUTHNAVFACENGCOM shall provide you copies of the pending Preliminary Assessment Contamination Plan and Report..." I also stated in a letter to Mr. Reese Batten dated July 24, 1989, (after my visit to the site) that a copy of the proposed work plan should be submitted. To date, the work plan has not been submitted for Departmental review and comment. In addition, any monitoring wells installed in South Carolina must receive approval prior to installation (R.61-71.11).

Please submit the work plan for the Chicora Tank Farm as soon as possible. If monitoring wells are proposed, a request for monitor well approvals should be included.

Thank you for your continued cooperation. I look forward to working with you and Mr. Batten in the future. If you have any questions, please call me at 734-5329.

Sincerely,


David G. Baize, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division

DGB/SOUTH

cc: Wayne Fanning, Trident District EQC

KEMRON
ENVIRONMENTAL SERVICES

1815 Century Boulevard ■ Suite 150 ■ Atlanta, Georgia 30345 ■ (404) 636-0928 ■ FAX: (404) 636-7162

Project 819-300

9 February 1990

Mr. David Baize
Groundwater Protection Division
DHEC
2600 Bull Street
Columbia, SC 29201

RECEIVED

FEB 15 1990

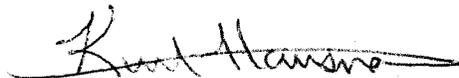
Dear Mr. Baize:

PROTECTION

Please find enclosed a copy of the Preliminary Contamination Assessment Report for the Chicora Tank Farm, in Charleston, South Carolina. Mr. Reese Batten of SouthDivNavFacEngCom has requested that we forward a copy of this report to you. This report outlines our plans to install monitoring wells at the Chicora Tank Farm. It is our understanding that you will deliver this report to the proper DHEC personnel and that monitoring well installation proceedings will then be initiated.

Please do not hesitate to contact the undersigned if you have any questions or comments concerning the PCAP or monitoring well installation notification procedures.

Sincerely,



Kurt D. Hausner
Geologist

Encl:

cc: Mr. Reece Batten

PCAPMW.NOT
KH: 2/9/90

File

South Carolina Department of Health and Environmental Control

2600 Bull Street
Columbia, S.C. 29201

Commissioner
Michael D. Jarrett



Board
Toney Graham, Jr., M.D., Chairman
Henry S. Jordan, M.D., Vice-Chairman
John B. Pate, M.D., Secretary
William E. Applegate
Oren L. Brady, Jr.
John Hay Burriss
Euta M. Colvin, M.D.

July 24, 1989

Mr. Reece Batten
Southern Division
2155 Eagle Drive
P.O. Box 10068
Charleston, SC 29411-0068

Re: Charleston Naval Shipyard (CNS)
NSC Tank Farm - Chicora Tank Farm
Charleston County

Dear Mr. Batten:

A site inspection at the referenced facilities was conducted on July 14, 1989. Per our phone conversation on July 17, 1989, and as a result of the site visit, the following comments are provided:

NSC Tank Farm

- 1) Three aboveground tanks (3P-J, 3900-G, 3900-H) have been removed at this site. Since these tanks were not designated as SWMU's during the RFA, the Ground-Water Protection Division (GWPD) will provide the technical review for any additional assessment/remediation.
- 2) The recommendation by Southern Division to remove the areas of contaminated soil is appropriate. The GWPD recommends that the contaminated soil be removed as expeditiously as possible to limit leaching of contaminants to the ground-water (in coordination with Harold Seabrook - BSHWM, and Trident District EQC).
- 3) Since the most current ground-water quality data is from analyses dated May, 1987, the resampling of all monitor wells for total petroleum hydrocarbons (TPH) and the previously detected polynuclear aromatic hydrocarbons (PAH's) is recommended.
- 4) Soil borings SB-2 and SB-8, located in the middle of the concrete pads for tanks 3900-G and H, are still open and should be properly abandoned (completely filled with cement grout). An oily product was observed on top of the water in the open soil borings.

Mr. Reece Batten
July 24, 1989
Page 2

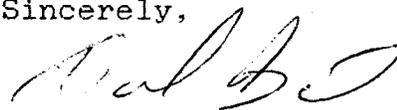
Chicora Tank Farm

- 1) Free product was observed in the sumps (used to lower the water table and drain water away from the tanks at this site), and the sides of the tanks inspected were covered with an oily product from seepage from the tanks.

Please submit a copy of the proposed work plan to assess the soil/ground-water impact at this site for technical review and comment.

Thank you for your cooperation in addressing these problems at the CNS. If you have any questions, please call me at 734-5329.

Sincerely,



David Baize, Hydrogeologist
Assessment and Development Section
Ground-Water Protection Division

DE/dwb
RB.TXT

cc: Alan Shoultz
CNS

Trident District EQC

Harold Seabrook
BSHWM

Joe Bowers
BSHWM

South Carolina Department of Health and Environmental Control

2600 Bull Street
Columbia, S.C. 29201



Commissioner
Michael D. Jarrett

Trident District
Environmental Quality Control
2470 Air Park Road
North Charleston, SC 29418
(803) 554-5533

Board
Harry M. Hallman, Jr., Chairman
Toney Graham, Jr. M.D., Vice-Chairman
John B. Pate, M.D., Secretary
Oren L. Brady, Jr.
Moses H. Clarkson, Jr.
Euta M. Colvin, M.D.
Henry S. Jordan, M.D.

July 12, 1989

Mr. Jack Armstrong
DODIG
Creststar Bldg 5, Rm 520
2501 Washington Ave.
Newport News, Virginia 23607

Re: USN Chicora Tank Farm
Charleston County

Dear Mr. Armstrong:

This is to document our conversation of today regarding potential contamination at the above referenced facility, and how the South Carolina Department of Health and Environmental Control regulates such occurrences.

Attached is a copy of the S.C. Pollution Control Act as requested. Please call me at (803) 554-5533 if I can be of further assistance.

Sincerely,

Wayne Fanning

Wayne Fanning
Assistant Director
Trident District EQC

Attachment
WF/wf

cc: David Baize, Groundwater Protection Division

RECEIVED
JUL 14 1989
GROUND-WATER
PROTECTION DIVISION



DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

2155 EAGLE DR., P. O. BOX 10068

CHARLESTON, S. C. 29411-0068

PLEASE ADDRESS REPLY TO THE
COMMANDING OFFICER, NOT TO
THE SIGNER OF THIS LETTER.
REFER TO:

5090

JUL 6 1152/13

03 JUL 1989

S. C. Dept. Health & Environmental Control
Office of Environmental Health
Toxicology

Mr. Wayne Fanning
Department of Health and Environmental Control
Trident Area
1000 Air Park Road
Charleston, SC 29418

Subj: CHICORA TANK FARM INVESTIGATION - NAVAL SUPPLY CENTER, CHARLESTON NAVAL SHIPYARD, CHARLESTON, SC

Dear Mr. Fanning:

As discussed during the phone conversation between you and our Mr. Reece Batten on June 23, 1989, SOUTHNAVFACENGCOM has been requested by the Naval Supply Center to conduct the subject investigation. SOUTHNAVFACENGCOM shall provide you with copies of the pending Preliminary Assessment Contamination Plan and Report, The Contamination Assessment Plan and Report, and the Remedial Assessment Plan as these documents become available.

Please accept the enclosed schedule as notification of suspected contamination occurring at the Chicora Tank Farm, Naval Supply Center, Charleston Naval Shipyard.

If you have any questions, please contact Mr. Reece Batten, Code 11521, at (803) 743-0578.

Sincerely


J. B. MALONE, JR., P.E.
Acting Head, Environmental Branch

Encl:

(1) SOUTHDIV Assessment Investigation of December 1988

Copy to:

DFSC Cameron Station

DLA Cameron Station

NSC Charleston Naval Shipyard (Code 44)

NAVSHIPYD Charleston (Code 460)



06/30/89

RECORD #13

Project Contract / Schedule Format

	EIC :>11521		PROGRAM :>02-AMEND			
	ACTIVITY :>NB CHARLESTON		SITE(S) ID:>CHICORA TANK FARM			
	Event	Planned	Actual	Contr#	Amend	Award Amt
1	S.O.W COMPLETED	07/13/89	00/00/00			\$0.00
2	GOV EST COMPLETED	07/14/89	00/00/00			\$0.00
3	AE FEE REQUEST TO 02	07/17/89	00/00/00			\$0.00
4	AE FEE PROP RECEIVED	08/07/89	00/00/00			\$0.00
5	..02 SET GOV POSIT'N	09/06/89	00/00/00			\$0.00
6	..02 NEGOTIATE	10/18/89	00/00/00			\$0.00
7	NEGOT(RPT3) APPROV'L	11/01/89	00/00/00			\$0.00
8	..02 NOTICE TO PROCD	11/15/89	00/00/00			\$0.00
9		00/00/00	00/00/00			\$0.00
10		00/00/00	00/00/00			\$0.00
11		00/00/00	00/00/00			\$0.00
12		00/00/00	00/00/00			\$0.00
13		00/00/00	00/00/00			\$0.00
14		00/00/00	00/00/00			\$0.00
15		00/00/00	00/00/00			\$0.00
16		00/00/00	00/00/00			\$0.00
17		00/00/00	00/00/00			\$0.00

COMMENT:>

06/30/89

RECORD #12

Project Contract / Schedule Format

	EIC :>11521		PROGRAM :>USTEVAL			
	ACTIVITY :>NB CHARLESTON		SITE(S) ID:>CHICORA TANK FARM			
	Event	Planned	Actual	Contr#	Amend	Award Amt
1	PCAP AWARD	11/15/89	00/00/00	870650	00.01	\$0.00
2	DFT PCAP/CAP SUBMIT	03/15/90	00/00/00			\$0.00
3	DFT PCAP/CAP CMT RTN	05/14/90	00/00/00			\$0.00
4	FINAL PCAP/CAP SUBMT	06/13/90	00/00/00			\$0.00
5	CAR AWARD	09/11/90	00/00/00			\$0.00
6	90% CAR SUBMITTED	02/08/91	00/00/00			\$0.00
7	DFT CAR (RECMDN) SUBMT	03/11/91	00/00/00			\$0.00
8	DFT CAR COMMENT RTN	05/10/91	00/00/00			\$0.00
9	FIN CAR (RECMDN) SUBMT	06/10/91	00/00/00			\$0.00
10	RAP AWARD	09/09/91	00/00/00			\$0.00
11	DRAFT RAP SUBMITTED	11/08/91	00/00/00			\$0.00
12	DRAFT RAP COMMENTS	12/09/91	00/00/00			\$0.00
13	FINAL RAP SUBMITTED	01/08/92	00/00/00			\$0.00
14		00/00/00	00/00/00			\$0.00
15		00/00/00	00/00/00			\$0.00
16		00/00/00	00/00/00			\$0.00
17		00/00/00	00/00/00			\$0.00

COMMENT:> (A/E-Wapora:J.Dwyer); DHEC PHONE Notified 6/23/89

