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COMPLETION REPORT FOR CHICORA TANK FARM DEMOLITION REPORT CNC
CHARLESTON SC
12/20/1999
SOUTH CAROLINA RESEARCH AUTHORITY

COMPLETION REPORT
Chicora Tank Farm Demolition Report
Chicora Tank Farm, North Charleston, SC

Program Manager:  Date: 12/20/99

Prepared By: C. Wannamaker, Jr. Date: 12/20/99
SOUTH CAROLINA RESEARCH AUTHORITY
Environmental Enterprise Group

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Environmental Enterprise Group
1899 NORTH HOBSON AVENUE
NORTH CHARLESTON, SC 29405-2106

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TANK CLOSURE

1.0 SITE DESCRIPTION

The Chicora Tank Farm is located in North Charleston approximately ½ mile west of the Charleston Naval Complex. Tanks K, L, M, N, & O were on this site of 23.6 acres. Tanks K, L, M, & N were 2.1 million gallon tanks and tank O was a 1.1 million gallon tank. Each tank had an attached pump room. Chicora Tank Farm is bounded by Carner Avenue on the west, Chicora Avenue on the east, Clements Ferry Road to the south, and a marshland area to the north. The Norman C. Toole Magnet School abuts the property to the northwest.

2.0 TANK AND PUMP ROOM DESCRIPTION

The tanks were constructed in the mid 1940's as cut-and-cover concrete underground storage tanks. Tanks K, L, M, & N were designed to contain Bunker C and were later switched to contain diesel fuel. These tanks were 138.5 feet in diameter and 20 foot inside height with 52 concrete roof supporting columns. Tank O was 102.5 feet in diameter, 20 foot inside height and had 38 concrete roof supporting columns. These tanks had four to five feet of soil covering over the top. The pump rooms were approximately 24 feet x 24 feet x 25 feet high and had seven feet of soil on top. The tanks and pump rooms were poured-in-place concrete structures reinforced with steel rebar and the tank walls were banded with prestressed steel rods tightened with turnbuckles. The tops of the tanks were at an elevation approximately 20 feet above mean sea level. The top of the pump rooms were about three feet lower than the tanks.

3.0 SUMMARY OF WORK

Work plan approval

The statement of work for the project required South Carolina Department of Health and Environmental Control (SCDHEC) approval of the comprehensive demolition work plan prior to any work on site. The SCDHEC approval for this Work Plan is provided in Appendix A.

Monitoring well abandonment

Six monitoring wells (MW- 4, 5, 6, 7, 8, and 9) were in the areas of excavations surrounding the tanks undergoing demolition. These wells were abandoned in accordance with South Carolina Well Standard and Regulations R. 61-71 and with SCDHEC approval. See Appendix B for the completion of work letter.

Erosion control plan approval

The tank demolition project was estimated to disturb approximately 10 acres of soil. Each tank and pump room was excavated seven feet below finished grade, demolished down to eight feet above mean sea level, then backfilled to grade, and stabilized by hydroseeding. Erosion control measures were implemented and maintained throughout the project at Chicora Tank Farm. The Erosion Control Plan was approved by the Office of Ocean and Coastal Resource Management (OCRM) of SCDHEC, based on the State Stormwater Management and Sediment Reduction Act per section 72-302 (B). See Appendix C for the completion of work correspondence to OCRM of SCDHEC and pictures.

Asbestos abatement permit

Mastic and tar like coatings on underground piping and concrete electrical duct bank containing transite was investigated as potential asbestos containing material. The coatings and the transite tested positive for asbestos and were removed as asbestos containing material. Asbestos abatement project license number M9904004 was issued on April 7,1999. The license covered permitting for the removal and disposal of steam piping, electrical conduit, and fuel piping at Chicora Tank Farm. The permit was issued by SCDHEC Bureau of Air Quality for disposal of the asbestos waste at Chambers-Oakridge Landfill, DWP-130. (See Appendix D for manifests)

Tank demolition and backfill

The tanks and pump rooms were emptied, cleaned and inspected. There was a health and safety officer on site during the demolition phase of each tank and pump room. Heavy demolition equipment was used to crush the concrete of the tanks and pump rooms. The lower portion of the walls of the tanks and pump rooms (approximately eight feet) and the bottom remained intact. The tank walls were crushed down to the top of the French drain system surrounding each tank. The top of the French drain system was about 12 feet from the top of each tank. The broken concrete was collected in the bottom section of the tanks and pump rooms.

Backfill was used to fill the voids created around the crushed concrete in the bottom of the tanks and pump rooms. The remaining lower portion of the tanks and pump rooms were backfilled up to the tank wall section and compacted with vibratory compactors. Each site was contoured and sloped to ensure drainage of rain water away from the remaining tank sections.

Clay cap

The backfilled tank sites were capped with 12 inches of clay to prevent infiltration of rainwater into the remaining tank sections. The clay was applied in two eight inch lifts. Each lift was compacted using a 10 ton smooth drum and sheepsfoot vibratory compactor. The clay was sampled in-place from each site. The samples were tested in the lab for hydraulic conductivity. The sample results were required to have permeability of at least 10^{-7} cm/sec (hydraulic conductivity test ASTM – D5084). See Appendix E for all tests results. Then each tank site was backfilled with the excavated soil and graded to allow for surface water run-off (less than 25 degree slope), compacted, and seeded using hydroseed techniques.

Petroleum contaminated soil disposal

Petroleum contaminated soil was discovered around the pipeline that exited the tank O pump room. Petroleum contaminated soil was discovered beneath the six and 16 inch lines where these were excavated to isolate the pump room. These pipelines were excavated approximately 35 feet east of the pump room. The 12 inch sludge oil header piping was connected to each pump room via 6 inch

underground pipelines. The 18 inch underground distribution header manifold piping had 16 inch underground pipelines connecting the underground distribution header manifold to each pump room. There were two penetrations into the tank O pump room from the underground distribution header manifold piping: one 6 inch and one 16 inch pipeline. This was further investigated by Tetra Tech, Inc. and resulted in Environmental Detachment Charleston removing for disposal 482 tons of contaminated soil from beneath the pipelines. A summary will be provided as a separate report by Tetra Tech. See Appendix F for disposal manifests.

4.0 TANK ELEVATIONS

The Tank Farm survey reference bench mark is the railroad spike in the power pole located at the extreme southwest corner of Chicora Tank Farm with an elevation of 16.31 feet above mean sea level (MSL). A survey point was taken from a location on top of each tank to establish the height of the tanks. The elevations compare the tank sites during phases of backfilling, clay installation and final grading.

Survey elevations from the tank sites (in feet above MSL)

| Location | Tank K | Tank L | Tank M | Tank N | Tank O |
|--|---------------|---------------|---------------|---------------|---------------|
| tank top prior to demolition | 20.1 | 20.0 | 20.0 | 20.0 | 20.0 |
| center of tank site under the clay cap after backfilled with native soil | 8.7 | 8.3 | 8.8 | 8.5 | 9.0 |
| center of tank site on top of the clay cap material | 10.0 | 10.0 | 10.0 | 9.8 | 10.2 |
| center of tank site finished grade | 15.6 | 16.6 | 15.4 | 16.7 | 17.4 |

5.0 CLAY CAP THICKNESS

The tank site elevations were measured at 15 survey points. The depth of the clay cap material was determined from the results of the elevations taken before and after installation. The clay cap was applied over the backfilled sites. These sites were contoured for drainage away from the center of the tanks. The clay extended five feet minimum beyond the walls of the remaining tanks and pump rooms sections. The clay was applied in two lifts each eight inches thick. The clay was required to be at least 12 inches minimum thickness covering the top of the remaining tank sections. The results of the surveyed thickness are shown below.

Clay cap thickness (inches)

| Survey point | Tank K | Tank L | Tank M | Tank N | Tank O |
|--------------|--------|--------|--------|--------|--------|
| <i>1</i> | 13 | 17 | 12 | 14 | 20 |
| <i>2</i> | 13 | 15 | 12 | 13 | 15 |
| <i>3</i> | 12 | 12 | 12 | 16 | 17 |
| <i>4</i> | 12 | 17 | 12 | 16 | 16 |
| <i>5</i> | 12 | 15 | 15 | 15 | 12 |
| <i>6</i> | 14 | 13 | 12 | 15 | 15 |
| <i>7</i> | 12 | 14 | 12 | 12 | 16 |
| <i>8</i> | 13 | 14 | 12 | 13 | 15 |
| <i>9</i> | 13 | 15 | 14 | 13 | 16 |
| <i>10</i> | 12 | 17 | 12 | 13 | 18 |
| <i>11</i> | 14 | 16 | 14 | 15 | 17 |
| <i>12</i> | 12 | 15 | 14 | 15 | 16 |
| <i>13</i> | 12 | 15 | 17 | 16 | 17 |
| <i>14</i> | 14 | 12 | 17 | 13 | 15 |
| <i>15</i> | 13 | 16 | 12 | 15 | 16 |

6.0 FINAL GRADE ELEVATIONS

Elevations from the tank sites were taken at 13 locations after backfilling and grading. The asteric (*) denotes survey locations at the center point of each the tank site. The final plan grade was between 14.5 and 16.5 feet above MSL. Tank M was slightly lower due to about 2,000 tons of petroleum contaminated soil removed near that site. Tank O was slightly higher because approximately 350 tons of clean, bioremediated soil was added on top of the clay cap. All tank sites were graded and contoured to the existing site conditions.

Elevations (in feet above MSL)

| Survey point | Tank K | Tank L | Tank M | Tank N | Tank O |
|--------------|--------|--------|--------|--------|--------|
| <i>1</i> | 15.3 | 16.6* | 15.1 | 16.6 | 17.1 |
| <i>2</i> | 15.6 | 13.4 | 15.2 | 15.9 | 17.4 |
| <i>3</i> | 15.6* | 14.4 | 14.8 | 15.4 | 17.5 |
| <i>4</i> | 15.2 | 13.6 | 14.4 | 15.1 | 17.1 |
| <i>5</i> | 14.7 | 13.4 | 14.3 | 14.8 | 16.9 |
| <i>6</i> | 14.9 | 14.6 | 13.4 | 15.0 | 17.3 |
| <i>7</i> | 15.4 | 15.9 | 14.0 | 15.2 | 17.3 |
| <i>8</i> | 15.5 | 16.3 | 14.6 | 15.7 | 16.6 |
| <i>9</i> | 15.2 | 14.1 | 15.2 | 16.2 | 17.1 |
| <i>10</i> | 15.6 | 15.1 | 15.4 | 16.3 | 17.6 |
| <i>11</i> | 15.8 | 14.6 | 15.1 | 16.5 | 17.5 |
| <i>12</i> | 15.1 | 15.2 | 14.8 | 16.7* | 17.6 |
| <i>13</i> | 15.8 | 15.0 | 15.4* | 16.9 | 17.4* |

Photographs for tank K

(photos 1-13)

7.0 PHOTOGRAPHS

7.1 Tank K pictures

Photo 1: The tank and pump room were excavated



Photo 2: The all terrain dump truck moved soil from the tank site



Photo 3: The electrical duct bank was removed prior to demolition of the tank

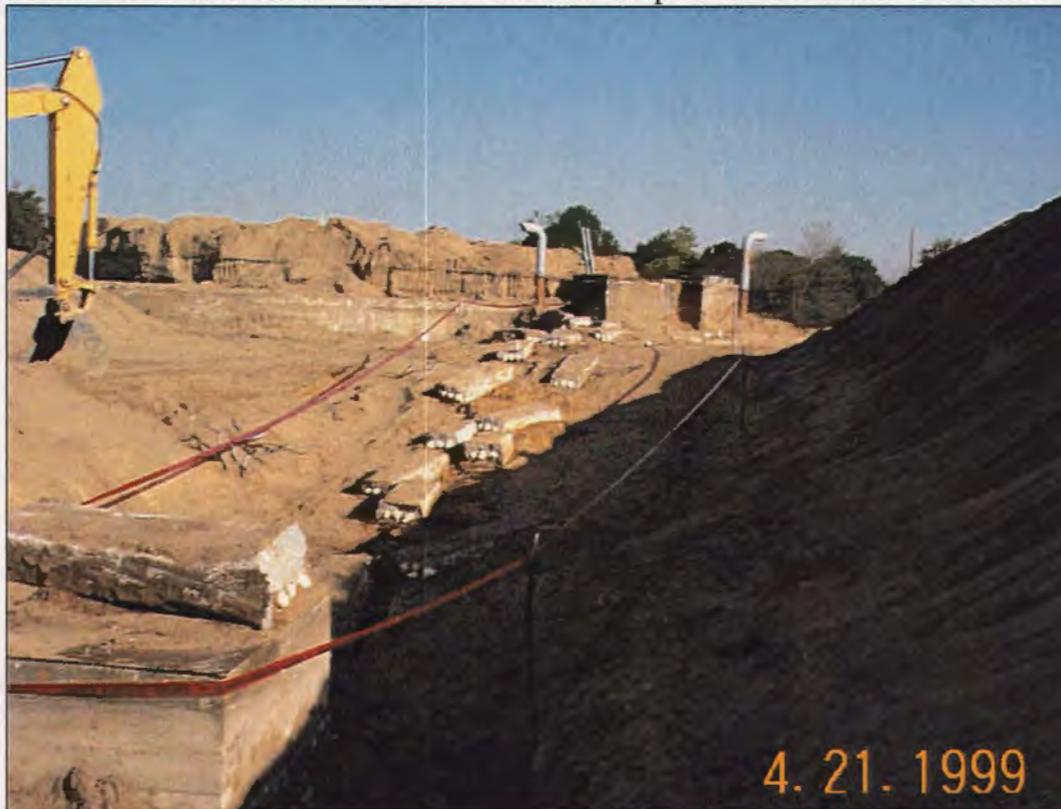


Photo 4: The pump room top and walls were crushed



Photo 5: Trackhoes equipped with the concrete crushing tools munched the tank



Photo 6: Soil was left on top of the tank for dust control purposes during demolition



Photo 7: The concrete rubble with the backfill soil was mixed in the remaining tank section to reduce settling



Photo 8: The tank wall was crushed down to the top of the French drain system



Photo 9: The remaining tank site was backfilled, contoured, and compacted prior to clay



Photo 10: The clay cap was delivered by a contractor and spread by the trackhoe



Photo 11: The clay cap was compacted with a ten ton sheepsfoot compactor



Photo 12: The clay cap was covered with native backfill soil



Photo 13: The tank site was backfilled, contoured and covered



Photographs from tank L

(photos 1-13)

7.2 Tank L pictures

Photo 1: The tank and pump room were unearthed



Photo 2: The 6 inch sludge piping that was coated with asbestos material was removed



Photo 3: Trackhoes with the concrete crushing attachments demolished the tank



Photo 4: The rebar ends on the tank wall were cut with an acetylene torch



Photo 5: Backfill was pushed in along with the crushed concrete



Photo 6: While crushing the pump room wall, water from the fire hose controlled dust



Photo 7: The concrete walls of the pump room were crushed



Photo 8: The remaining tank site was prepared for the clay cap



Photo 9: The clay cap was installed and compacted

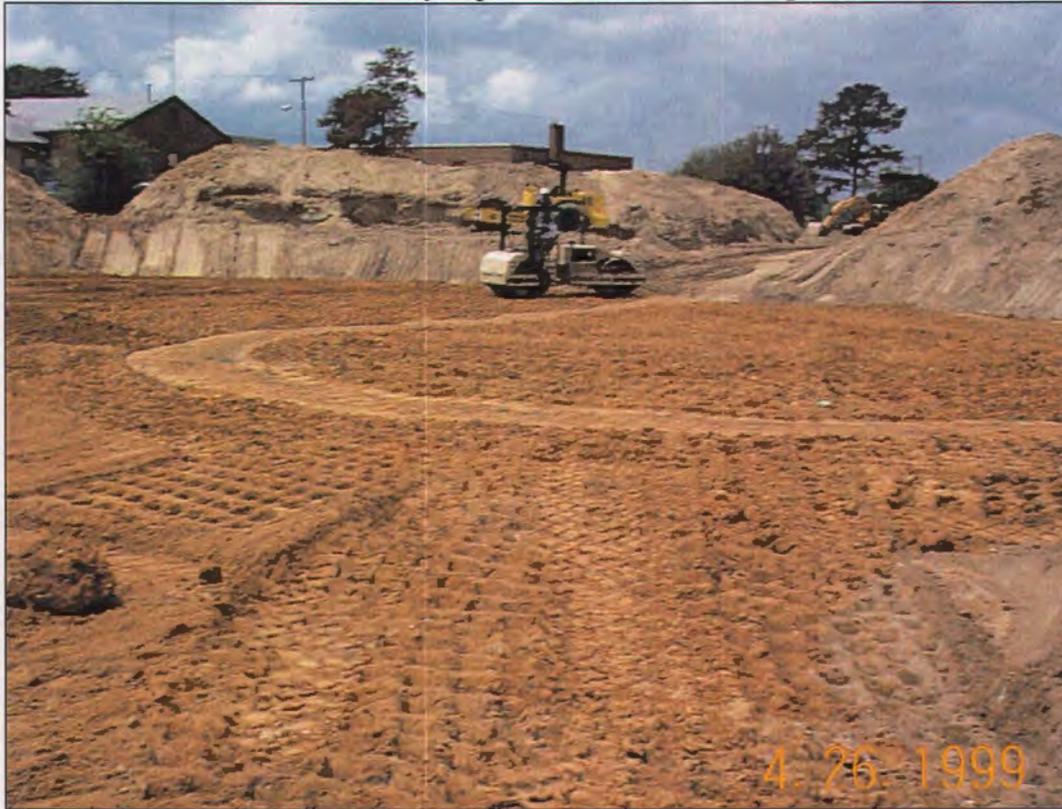


Photo 10: A contractor tested in place permeability of the clay cap

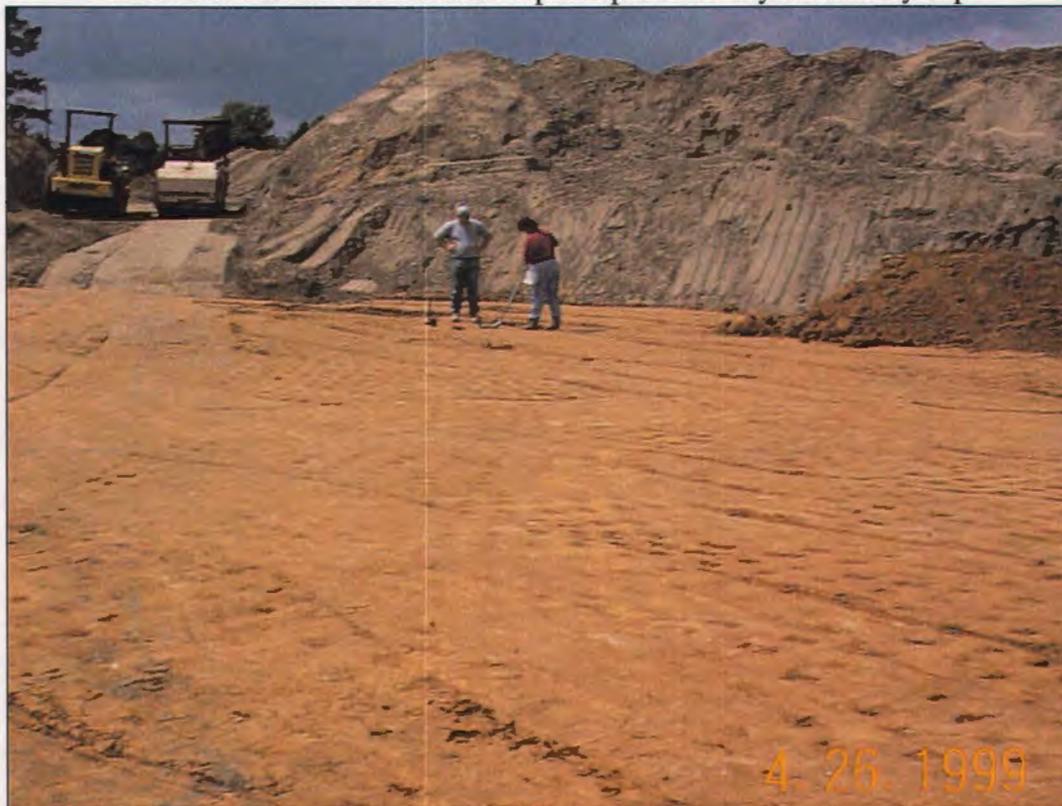


Photo 11: The clay cap was covered with backfill



Photo 12: The backfilled tank site was contoured with the motor grader



Photo 13: The backfilled tank site was hydroseeded



Photographs from tank M

(photos 1-14)

7.3 Tank M pictures

Photo 1: The 16 inch fill and 6 inch sludge piping was excavated



Photo 2: The concrete on the tank was munched



Photo 3: The trackhoe builds the access ramp into the tank bottom



Photo 4: Trackhoes crush the pump room walls to the finished level



Photo 5: The exposed rebar on the wall was cut off flush so that the clay cap would seal the remaining tank section



Photo 6: The tank site was backfilled, compacted, and contoured to drain rain water



Photo 7: Contractor transport trucks dumped the clay material over the backfilled tank site



Photo 8: The clay material was applied in two eight inch lifts



Photo 9: Each clay lift was tested in-place for permeability



Photo 10: The survey crew measured elevations to determine the thickness of the clay cap



Photo 11: Samples were collected to test the permeability of the first clay lift



Photo 12: The tank site was backfilled and compacted



Photo 13: The remaining tank site was built up to final grade



Photo 14: The tank site was compacted



Photographs from tank N

(photos 1-13)

7.4 Tank N pictures

Photo 1: The electrical duct bank was unearthed for removal



Photo 2: The six inch sludge and 16 inch fill piping was unearthed for removal



Photo 3: Steel banding was removed prior to crushing the tank wall



Photo 4: Tank top and wall demolition in progress



Photo 5: Tank top demolition continued in the rain



Photo 6: Trackhoes munched the pump room concrete



Photo 7: The remaining tank site was backfilled and compacted



Photo 8: A contractor delivered clay cap material



Photo 9: The trackhoe spread the clay material and the 10 ton smooth drum vibratory compactor compacted the clay material



Photo 10: The contractor tested the first lift of the clay cap



Photo 11: The clay cap was covered with backfill native soil



Photo 12: The site was prepared for hydroseeding



Photo 13: The hydroseed contractor stabilized the remaining tank site



Photographs from tank O

(photos 1-14)

7.5 Tank O pictures

Photo 1: The electrical duct bank was prepared for disposal



Photo 2: The south side of the tank was excavated



Photo 3: The six inch sludge and 16 inch fill piping was removed from the pump room



Photo 4: Equipment access roadway was cut around the tank



Photo 5: The trackhoe crunched the pump room and tank



Photo 6: Tank wall was removed down to the top of the french drain



Photo 7: The trackhoes backfilled the remaining tank section



Photo 8: The exposed rebar on top of the remaining wall was cut off



Photo 9: The tank site was graded, contoured, and compacted



Photo 10: The first lift of the clay cap was spread and compacted



Photo 11: The second lift was compacted with the 10 ton smooth drum compactor



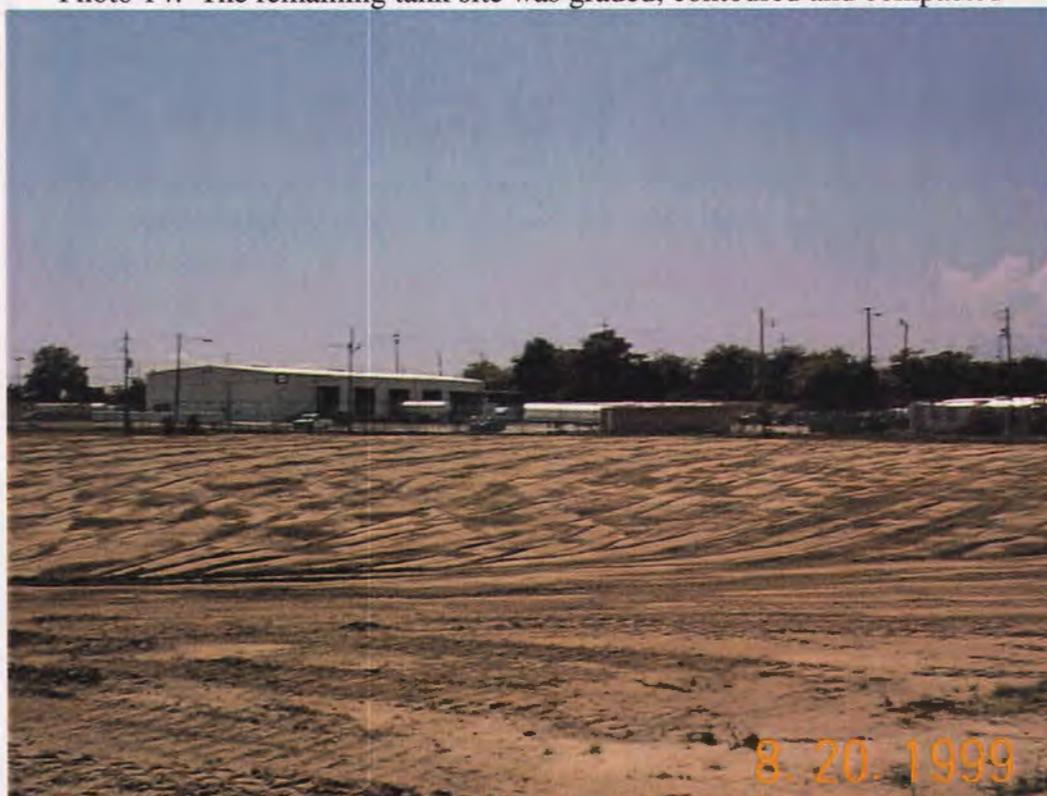
Photo 12: Bioremediated soil was dumped on the remaining tank site



Photo 13: The tank site was backfilled and compacted



Photo 14: The remaining tank site was graded, contoured and compacted



APPENDIX A

SCDHEC Demolition on site wavier

DEMOLITION ON SITE WAIVER 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 tanks/pump rooms "K, L, M, N & O" demolitions will be disposed of within the tank and pump room bottoms only. Since the concrete waste will be contained in the lower section of the tanks and pump rooms, this WAIVER authorizes 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

John V. Brundell
(Concur)

Date 4/14/99

APPENDIX B

Monitoring wells abandoned



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. 319

APR 19 1999

MEMORANDUM

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

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

Subj: MONITORING WELLS AT CHICORA TANK FARM ARE ABANDONED

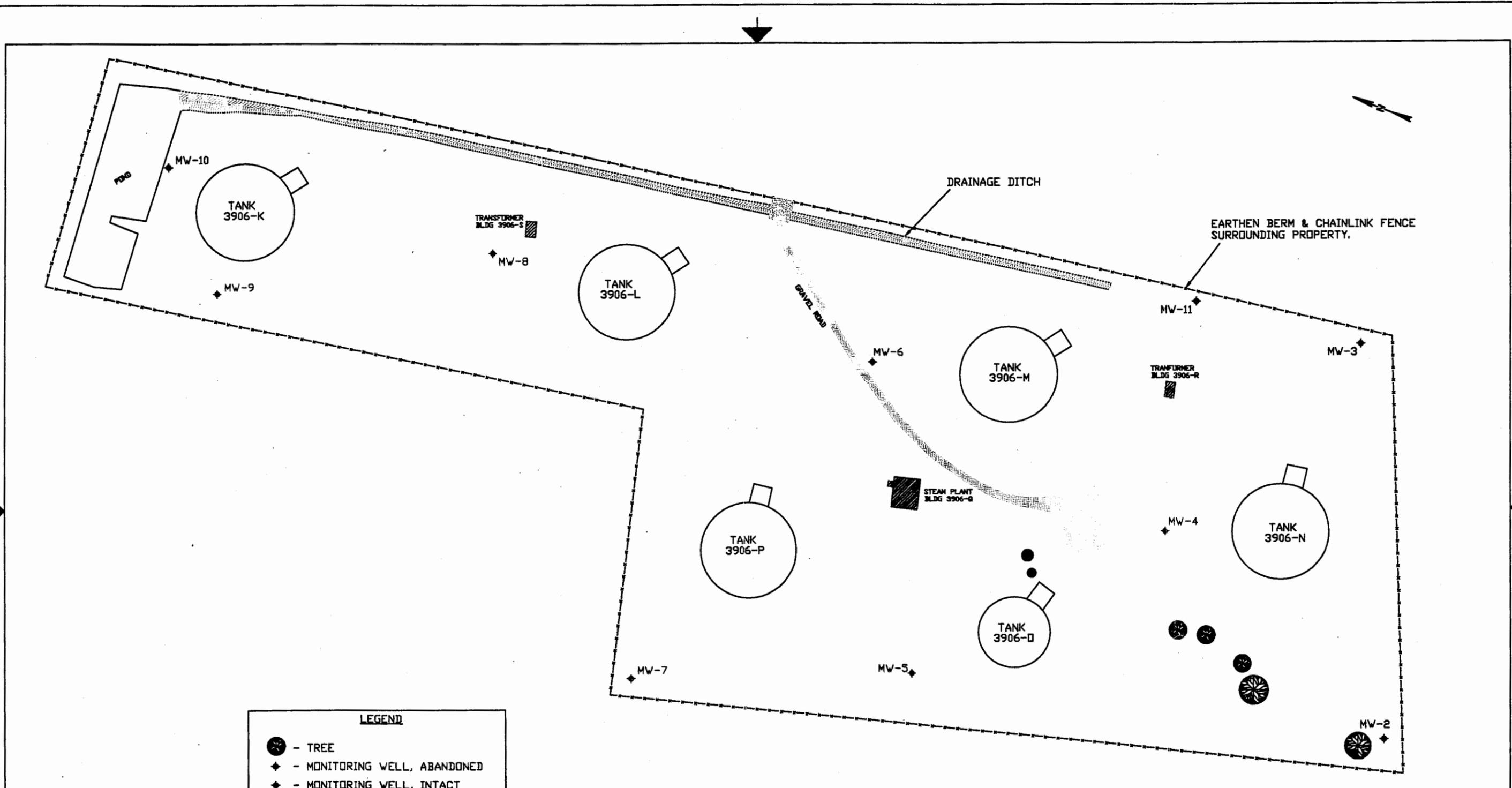
Ref: (a) South Carolina Department of Health and Environmental Control letter
dated March 30, 1999 "Approval for abandonment of monitoring wells
MW-4,5,6,7,8, and 9 at Chicora Tank Farm".

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.

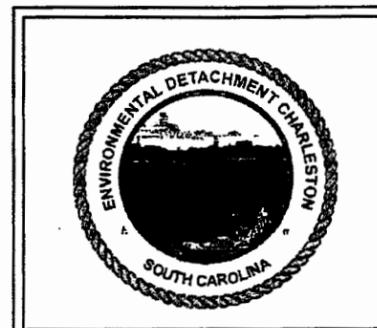
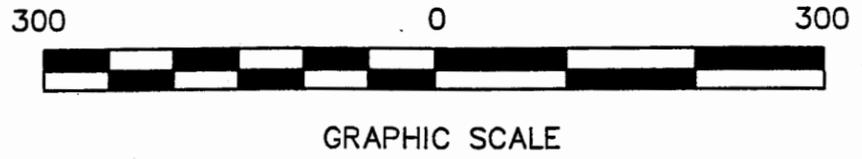
Respectively,

E.R. Dearhart



LEGEND

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



| | | | |
|---|-------------------------|-----------------------------|----------|
| 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 | |

Photo 1: The monitoring well located on the north side of tank M was abandoned.



Photo 2: The monitoring well was grouted



APPENDIX C

Correspondence for erosion control



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 29405-2108

IN REPLY REFER TO:

Ser. 800
September 13, 1999

South Carolina Department of Health & Environmental Control
Office of Ocean and Coastal Resource Management
Ms. Barbara Neale
1362 Macmillan Ave., Suite 400
North Charleston, SC 29405

RE: Completion of Chicora Tank Farm project

Ms. Neale,

The Environmental Detachment of Charleston (DET) was tasked by Naval Facilities Engineering Command, Southern Division (SOUTHDIV) to excavate and demolish tanks and pump rooms K, L, M, N, and O at Chicora Tank Farm (CTF). The CTF tank sites are on 24 acres located in North Charleston approximately ½ mile west of the Charleston Naval Complex. CTF is bounded by Carner Avenue on the west, Chicora Avenue on the east, Clements Ferry Road to the south, and a marshland area to the north.

The CTF demolition project has been completed. The settling pond and the drainage system onsite were not disturbed during this project.

During the project, the DET mechanically retarded and controlled the rate of runoff to the settling pond. Methods included building of diversion ditches, installing plastic sheeting and erosion control fencing, and laying hay bails to retard and divert runoff to protected drainage ditches.

The tanks and pump rooms were demolished 7-8 feet below finish grade. Each tank site was backfilled, graded, and hydroseeded afterward. The completed tank sites have a finished maximum grade of approximately 15 - 17 feet above mean sea level and closely match the surrounding grade between tanks. Each tank site was hydroseeded with bermuda and an annual seed mixture after the completion of final grading.

I appreciate your time and effort involved with this project. If there are any comments or questions concerning these issues please direct them to Copes Wannamaker at 202-8035.

Respectively,

for E. R. Dearhart
E. R. Dearhart
Director

Photo 1: Silt fencing along the west side of tank K



Photo 2: Hay bales reinforce the silt fencing during the soil disturbing work



Photo 3: The north side of tank K



Photo 4: The sediment collection pond at the north end of the site



APPENDIX D

Asbestos abatement permit and manifests



ASBESTOS ABATEMENT PROJECT LICENSE
REVISED

License Number: M9904004

2600 Bull Street
Columbia, SC 29201-1708

E. R. DEARHART
SUP. OF SHIPBLDG & REPAIR-CHAS
1899 N. HOBSON AVE.
NORTH CHARLESTON SC 29405-2106

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

SITE: CHICORA TANK FARM;CHICORA AVE;TANK K
LOCATION: N CHARLESTON
AMOUNT: 2 SF Electrical Conduit (ACM) , 135 LF NF Elec Conduit (ACM) , 2007 LF NF Conduit,
Fuel, St P , 35 SF Conduit, Fuel, Steam Pip

This license is issued on the basis of information provided in your asbestos abatement notification postmarked April 07, 1999. Please refer to the license number above whenever you communicate with DHEC about this project. Use of this license indicates your agreement that the information herein is accurate. This license is non-transferable and is issued subject to the following conditions.

I. Removal or other abatement activities which have the potential to disturb friable asbestos shall begin April 21, 1999, and shall be completed on August 27, 1999. If there is any change in these dates, you must notify DHEC in accordance with applicable States and Federal regulations.

II. You may verify the date for starting asbestos removal by calling the District Air Section Manager in Charleston, Bruce Hennessee at 740-1590.

III. Based on the information you have provided, you must pay a fee of \$25.00 for this project. Your payment in the amount of \$0.00 has been received. You will be billed for any amount due. If the amount of asbestos material abated increases after the project has begun, you must amend your notification and pay any additional fee due.

IV. You are hereby authorized to dispose of asbestos waste from this project at the Chambers-Oakridge Landfill, DWP-130. Authorization is valid only for the amount of asbestos indicated above, and for a reasonable amount of other asbestos-contaminated materials generated during this project. You must obtain prior approval for disposal from the landfill operator. There shall be no leakage or spillage during transport. Authorization for disposal shall expire twenty (20) days after August 27, 1999 in condition I. above.

V. At the conclusion of this project, you must submit a completed copy of your Waste Shipment Record to DHEC in Columbia.

VI. The SCDHEC Division of Solid Waste Planning & Recycling also has rules which govern the disposal of materials that have come in contact with lead-based paint. Please contact the Bureau of Land and Waste Management at (803)896-4000 for additional information.

For further information about asbestos abatement and disposal requirements, please contact the Asbestos Section at (803) 734-4517.

Issued: May 19, 1999

Office Code: _____

By: *David M. Hennessee*
Bureau of Air Quality

Administrator of Chambers-Oakridge Landfill
cc: B. Hennessee / J. Ohlandt, Trident Dist.
Rev CD 4/7/99; Rev CD & Added Material 5/19/99

ASBESTOS CHAIN-OF-CUSTODY FORM

(TRIP TICKET)

This form should be completed and copies kept by each party involved.

CONTRACTING COMMAND

NAME: Navy Public Works Center
 ADDRESS: 2482 redbank Rd.
 CITY: Goose Creek STATE: SC ZIP: 29445-9601 PHONE: (843) 743-7588

PICK-UP SITEProject Lic #
M9904004

NAME: Environmental Detachment Charleston
 ADDRESS: 1899 North Hobson Ave.
 CITY: North Charleston STATE: SC ZIP: 29405-2106 PHONE: 843) 743-6777
 ESTIMATED QUANTITY OF ASBESTOS WASTE: _____
 TYPE OF CONTAINER USED: 40 cu vd close top TOTAL # OF CONTAINERS USED: 1
 DESIGNATION OF WASTE: Asbestos Waste (25F Conduit) (135 LF NF ELEC. Conduit)
 SIGNATURE (AUTHORIZED TO RELEASE WASTE): _____ DATE: _____

(09, 09A OR 098)

4/30/99

TRANSPORTER

NAME: Fennell Container Co
 ADDRESS: P.O. Box 62679
 CITY: North Charleston STATE: SC ZIP: 29419-2679 PHONE: 843) 552-4751
 IS WASTE PROPERLY WETTED AND CONTAINERIZED? YES NO
 DO YOU ACCEPT RESPONSIBILITY FOR WASTE? YES NO
 TYPE CONTAINER: 40 cu vd close top TOTAL # OF CONTAINERS PICKED-UP: 1
 SIGNATURE OF TRANSPORTER REPRESENTATIVE: Fennell Benett DATE: 5-4-99

DISPOSAL SITE

NAME: Chambers Oakridge Landfill
 ADDRESS: 2183 HWY 78
 CITY: Dorchester STATE: SC ZIP: 29437 PHONE: (800) 952-5814
 CONTAINER TYPE: ~~40 cu vd close top~~ 20 yd open # OF CONTAINERS ACCEPTED: 1
 SIGNATURE OF DISPOSAL REPRESENTATIVE: Jessie Colwell DATE: 5/4/99

COPY TO:
 ORIGINATOR
 TRANSPORTER
 098
 SAFETY (DHEC)

TRANSPORTER TO RETURN ONE FULLY COMPLETED COPY TO PUBLIC WORKS DEPT (098)
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ORIGINAL

ASBESTOS CHAIN-OF-CUSTODY FORM

(TRIP TICKET)

This form should be completed and copies kept by each party involved.

CONTRACTING COMMAND

NAME: NAVY PUBLIC WORKS CENTER
ADDRESS: 2482 RED BANK Rd.
CITY: GOOSE CREEK STATE: SC ZIP: 29445-8601 PHONE: (843) 743-7588

M9904004

PICK-UP SITE

NAME: ENVIRONMENTAL DETACHMENT CHARLESTON (CHICORA TANK FARM)
ADDRESS: 1899 No. HOBSON AVE
CITY: No. CHARLESTON STATE: SC ZIP: 29405-2106 PHONE: (843) 743-6777 ext. 218
ESTIMATED QUANTITY OF ASBESTOS WSTE: 168 LF OF 6" PIPE
TYPE OF CONTAINER USED: 20 CY OPEN TOP TOTAL # OF CONTAINERS USED: 1
DESIGNATION OF WASTE: ASBESTOS
SIGNATURE (AUTHORIZED TO RELEASE WASTE): [Signature] DATE: 8/10/99

TRANSPORTER

NAME: FENNEL CONTAINER CO.
ADDRESS: P.O. BOX 62679
CITY: No. CHARLESTON STATE: SC ZIP: 29419-2679 PHONE: (803) 552-4751
IS WASTE PROPERLY WETTED AND CONTAINERIZED? YES NO
DO YOU ACCEPT RESPONSIBILITY FOR WASTE? YES NO
TYPE CONTAINER: TOTAL # OF CONTAINERS PICKED-UP:
SIGNATURE OF TRANSPORTER REPRESENTATIVE: [Signature] DATE: 8/12/99

DISPOSAL SITE

NAME: CHAMBERS OAKRIDGE LANDFILL
ADDRESS: 2183 HWY 78
CITY: DORCHESTER STATE: SC ZIP: 29437 PHONE: (803) 800-952-5814
CONTAINER TYPE: 20cy open top # OF CONTAINERS ACCEPTED: 1
SIGNATURE OF DISPOSAL REPRESENTATIVE: [Signature] DATE: 8/12/99

COPY TO:
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TRANSPORTER
098
SAFETY (DHEC)

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ASBESTOS CHAIN-OF-CUSTODY FORM

(TRIP TICKET)

This form should be completed and copies kept by each party involved.

CONTRACTING COMMAND

NAME: NAVY Public Works Center
ADDRESS: 2482 RED BANK RD.
CITY: GOOSE CREEK STATE: SC ZIP: 29445-8601 PHONE: (843) 743-7588

PROJECT Lic # M9904004

PICK-UP SITE

NAME: ENVIRONMENTAL DETACHMENT CHARLESTON (CHICORA TANK FARM)
ADDRESS: 1899 N. HOBSON AVE
CITY: N. CHARLESTON STATE: SC ZIP: 29405-2106 PHONE: (843) 743-1677 ext 228
ESTIMATED QUANTITY OF ASBESTOS WSTE: 60 LF
TYPE OF CONTAINER USED: 20 CY OPEN TOP TOTAL # OF CONTAINERS USED: 1
DESIGNATION OF WASTE: ASBESTOS
SIGNATURE (AUTHORIZED TO RELEASE WASTE): DATE: 7/13/99

TRANSPORTER

NAME: FENNEL CONTAINER CO.
ADDRESS: P.O. Box 62679
CITY: N. CHARLESTON STATE: SC ZIP: 29419-2679 PHONE: (843) 552-4751
IS WASTE PROPERLY WETTED AND CONTAINERIZED? YES NO
DO YOU ACCEPT RESPONSIBILITY FOR WASTE? YES NO
TYPE CONTAINER: TOTAL # OF CONTAINERS PICKED-UP:
SIGNATURE OF TRANSPORTER REPRESENTATIVE: DATE: 7-14-99

DISPOSAL SITE

NAME: CHAMBERS OAKRIDGE LANDFILL
ADDRESS: 2183 HWY 78
CITY: DORCHESTER STATE: SC ZIP: 29437 PHONE: (800) 952-5814
CONTAINER TYPE: 20 CY # OF CONTAINERS ACCEPTED:
SIGNATURE OF DISPOSAL REPRESENTATIVE: DATE: 7/14/99

COPY TO:
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TRANSPORTER
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SAFETY (DHEC)

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ASBESTOS CHAIN-OF-CUSTODY FORM

(TRIP TICKET)

This form should be completed and copies kept by each party involved.

CONTRACTING COMMAND

NAME: NAVY PUBLIC WORKS CENTER
ADDRESS: 2482 RED BANK Rd.
CITY: GOOSE-CREEK STATE: S.C. ZIP: 29445-801 PHONE: (843) 743 7588

PICK-UP SITE

Project Lic #
M9904004

NAME: ENVIRONMENTAL DETACHMENT CHARLESTON
ADDRESS: 1899 NORTH HOBSON AVE.
CITY: NORTH CHARLESTON STATE: SC ZIP: 29405-2106 PHONE: (843) 743-6777 ext 228
ESTIMATED QUANTITY OF ASBESTOS WSTE: 120 LF
TYPE OF CONTAINER USED: 20 CY OPEN TOP TOTAL # OF CONTAINERS USED: 1
DESIGNATION OF WASTE: ASBESTOS
SIGNATURE (AUTHORIZED TO RELEASE WASTE): [Signature] DATE: 6/8/98
(09, 09A OR 09B)

TRANSPORTER

NAME: FENNEL CONTAINER CO.
ADDRESS: P.O. Box 62679
CITY: NORTH CHARLESTON STATE: SC ZIP: 29419-2679 PHONE: (843) 552-4751
IS WASTE PROPERLY WETTED AND CONTAINERIZED? YES NO
DO YOU ACCEPT RESPONSIBILITY FOR WASTE? YES NO
TYPE CONTAINER: _____ TOTAL # OF CONTAINERS PICKED-UP: _____
SIGNATURE OF TRANSPORTER REPRESENTATIVE: [Signature] DATE: 6-8-99

DISPOSAL SITE

NAME: CHAMBERS OAKRIDGE LANDFILL
ADDRESS: 2183 HWY 78
CITY: DORCHESTER STATE: SC ZIP: 29437 PHONE: (800) 952-5814
CONTAINER TYPE: _____ # OF CONTAINERS ACCEPTED: _____
SIGNATURE OF DISPOSAL REPRESENTATIVE: [Signature] DATE: _____

- COPY TO:
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TRANSPORTER
09B
SAFETY (DHEC)

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ORIGINAL

ASBESTOS CHAIN-OF-CUSTODY FORM

(TRIP TICKET)

This form should be completed and copies kept by each party involved.

CONTRACTING COMMAND

NAME: NAVY PUBLIC WORKS CENTER
ADDRESS: 2482 RED BANK RD.
CITY: GOOSE-CREEK STATE: S.C. ZIP: 29445-801 PHONE: 843 743 7588

PROJECT LIC. #
M9904004

PICK-UP SITE

NAME: ENVIRONMENTAL DETACHMENT CHARLESTON
ADDRESS: 1899 NORTH HORSON AVE
CITY: N.W. CHAS. STATE: S.C. ZIP: 29405-2100 PHONE: (843) 743-6777
ESTIMATED QUANTITY OF ASBESTOS WSTE: 8 BAGS & 2 1/2" PIPING
TYPE OF CONTAINER USED: 20 yd close top TOTAL # OF CONTAINERS USED: 1
DESIGNATION OF WASTE: ASBESTOS

SIGNATURE (AUTHORIZED TO RELEASE WASTE): [Signature] DATE: 5/24/99
(09, 09A OR 09B)

TRANSPORTER

NAME: Fennel Container Co.
ADDRESS: P.O. Box 62679
CITY: North Charleston STATE: SC ZIP: 29419-2679 PHONE: (843) 552-4751
IS WASTE PROPERLY WETTED AND CONTAINERIZED? YES NO
DO YOU ACCEPT RESPONSIBILITY FOR WASTE? YES NO
TYPE CONTAINER: TOTAL # OF CONTAINERS PICKED-UP:
SIGNATURE OF TRANSPORTER REPRESENTATIVE: [Signature] DATE: 5-24-99

DISPOSAL SITE

NAME: Chambers Oakridge Landfill
ADDRESS: 2183 Hwy 78
CITY: Dorchester STATE: SC ZIP: 29437 PHONE: (800) 952-5814
CONTAINER TYPE: 20 yd close top # OF CONTAINERS ACCEPTED:
SIGNATURE OF DISPOSAL REPRESENTATIVE: [Signature] DATE: 5/24/99

- COPY TO:
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TRANSPORTER
09B
SAFETY (DHEC)

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ORIGINAL

ASBESTOS CHAIN-OF-CUSTODY FORM

(TRIP TICKET)

This form should be completed and copies kept by each party involved.

CONTRACTING COMMAND

NAME: NAVY PUBLIC WORKS CENTER
ADDRESS: 2482 RED BANK Rd.
CITY: GOOSE-CREEK STATE: S.C. ZIP: 29445-801 PHONE: 843 743 7588

PROJECT LIC. #
M9904004

PICK-UP SITE

NAME: ENVIRONMENTAL DETACHMENT CHARLESTON
ADDRESS: 1899 NORTH HOBSON AVE
CITY: No. CHAS. STATE: S.C. ZIP: 29405-2104 PHONE: (843) 743-6777
ESTIMATED QUANTITY OF ASBESTOS WSTE: 75 LF ELEC. CABLE DUCT
TYPE OF CONTAINER USED: 20 yd close top TOTAL # OF CONTAINERS USED: 1
DESIGNATION OF WASTE: ASBESTOS

SIGNATURE (AUTHORIZED TO RELEASE WASTE): [Signature] DATE: 5/24/99
(09, 09A OR 098)

TRANSPORTER

NAME: Fennel Container Co.
ADDRESS: P.O. Box 62679
CITY: North CHARLESTON STATE: SC ZIP: 29419-2619 PHONE: (843) 552-4751
IS WASTE PROPERLY WETTED AND CONTAINERIZED? YES NO
DO YOU ACCEPT RESPONSIBILITY FOR WASTE? YES NO
TYPE CONTAINER: TOTAL # OF CONTAINERS PICKED-UP:
SIGNATURE OF TRANSPORTER REPRESENTATIVE: [Signature] DATE: 5-24-99

DISPOSAL SITE

NAME: Chambers Oakridge Landfill
ADDRESS: 2183 Hwy 78
CITY: Dorchester STATE: SC ZIP: 29437 PHONE: (800) 952-5814
CONTAINER TYPE: # OF CONTAINERS ACCEPTED:
SIGNATURE OF DISPOSAL REPRESENTATIVE: [Signature] DATE: 5/24/99

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SAFETY (DHEC)

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APPENDIX E*Clay sample results*

Results from the modified Proctor density testing and permeability tests for each tank are provided in this appendix. In-place clay samples were taken from each tank site and were analyzed for compaction and permeability. The following are sample results:

| Tank | Lift | Sample | Compaction % | Hydraulic Conductivity |
|------|--------|--------|--------------|------------------------|
| K | first | 1. | 100+ | 4.7×10^{-7} |
| | | 2. | 86.2 | 9.8×10^{-8} |
| | | 3. | 91.4 | 4.9×10^{-7} |
| | | 4. | 91.3 | |
| | second | 1. | 89.5 | 3.7×10^{-8} |
| | | 2. | 86.4 | 4.0×10^{-8} |
| | | 3. | 92.7 | 8.2×10^{-8} |
| | | 4. | 85.3 | |
| L | First | 1. | 100+ | 4.7×10^{-7} |
| | | 2. | 86.2 | 9.8×10^{-8} |
| | | 3. | 91.4 | 4.9×10^{-7} |
| | | 4. | 91.3 | |
| | second | 1. | 89.5 | 3.7×10^{-8} |
| | | 2. | 86.4 | 4.0×10^{-8} |
| | | 3. | 92.7 | 8.2×10^{-8} |
| | | 4. | 85.3 | |
| M | first | 1. | 87.3 | 1.7×10^{-8} |
| | | 2. | 88.7 | 1.0×10^{-8} |
| | | 3. | 94.5 | 1.4×10^{-8} |
| | second | 1. | 89.7 | 8.9×10^{-8} |
| | | 2. | 88.0 | 1.2×10^{-8} |
| | | 3. | 83.6 | 2.8×10^{-8} |
| N | first | 1. | 95.2 | 4.7×10^{-7} |
| | | 2. | 91.2 | 9.5×10^{-8} |
| | | 3. | 93.6 | 9.9×10^{-8} |
| | second | 1. | 97.0 | 2.8×10^{-7} |
| | | 2. | 95.7 | 5.7×10^{-8} |
| | | 3. | 90.0 | 2.6×10^{-7} |
| O | first | 1. | 85.8 | 2.6×10^{-8} |
| | | 2. | 87.3 | 2.5×10^{-8} |
| | | 3. | 85.9 | 2.4×10^{-8} |
| | | 4. | 87.7 | |
| | second | 1. | 95.0 | 1.7×10^{-7} |
| | | 2. | 88.0 | 1.2×10^{-8} |
| | | 3. | 83.6 | 1.5×10^{-8} |
| | | 4. | 92.6 | |

| | | |
|---------------------------------|---|------------------------------------|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | ASTM - D 5084 |
| SCI Project: 99-686 | | Date: 5-13-99 |

SAMPLE IDENTIFICATION

| | | |
|---|---|--|
| Tank 'K' | Tank 'K' | |
| Density Test #1, 1st Lift (Brown inorg. clay w/sl. sand) | Density Test #2, 1st Lift (Brown inorg. clay w/sl. sand) | |

INITIAL CONDITIONS

| | | | |
|----------------------|-------|--------|--|
| Sample Length, cm | 5.08 | 5.0165 | |
| Sample Diameter, cm | 5.08 | 5.1435 | |
| Moisture Content, % | 15.5% | 29.2% | |
| Unit Wet Weight, pcf | 127.0 | 117.7 | |
| Unit Dry Weight, pcf | 110.0 | 91.1 | |
| Specific Gravity | 2.64 | 2.66 | |
| Porosity % | 33.2% | 44.7% | |
| Saturation, % | 82.3 | 95.4 | |

FINAL CONDITIONS

| | | | |
|----------------------|-------|--------|--|
| Sample Length, cm | 5.08 | 5.0165 | |
| Sample Diameter, cm | 5.08 | 5.1435 | |
| Moisture Content, % | 22.4% | 31.3% | |
| Unit Wet Weight, pcf | 128.9 | 119.8 | |
| Unit Dry Weight, pcf | 105.3 | 91.2 | |
| Saturation, % | 104.8 | 102.5 | |

TEST CONDITIONS

| | | | |
|--|------------------------|------------------------|--|
| Permeant | Potable Water | Potable Water | |
| Cell Pressure, psi | 32 | 32 | |
| Back Pressure, psi | 29-27 | 29-27 | |
| B-value | 0.95 | 0.97 | |
| Average Gradient | 28.3 | 28.7 | |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 4.796×10^{-7} | 9.883×10^{-8} | |

Undisturbed Specimens obtained 5-10-99.

Soil Consultants, Inc.

| | | |
|---------------------------------|---|------------------------------------|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | ASTM - D 5084 |
| SCI Project: 99-669 | | Date: 5-13-99 |

SAMPLE IDENTIFICATION

| | | |
|--|--|--|
| Tank 'K' | | |
| Density Test #3, 1st Lift (clay top chng. to sand w/ clay lenses) | | |

INITIAL CONDITIONS

| | | | |
|----------------------|-------|--|--|
| Sample Length, cm | 5.08 | | |
| Sample Diameter, cm | 5.08 | | |
| Moisture Content, % | 16.9% | | |
| Unit Wet Weight, pcf | 125.2 | | |
| Unit Dry Weight, pcf | 107.2 | | |
| Specific Gravity | 2.64 | | |
| Porosity % | 34.9% | | |
| Saturation, % | 82.9 | | |

FINAL CONDITIONS

| | | | |
|----------------------|-------|--|--|
| Sample Length, cm | 5.08 | | |
| Sample Diameter, cm | 5.08 | | |
| Moisture Content, % | 20.3% | | |
| Unit Wet Weight, pcf | 127.8 | | |
| Unit Dry Weight, pcf | 106.3 | | |
| Saturation, % | 97.4 | | |

TEST CONDITIONS

| | | | |
|--|------------------------|--|--|
| Permeant | Potable Water | | |
| Cell Pressure, psi | 32 | | |
| Back Pressure, psi | 29-27 | | |
| B-value | 0.95 | | |
| Average Gradient | 28.3 | | |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 4.946×10^{-7} | | |

Undisturbed Specimen obtained 5-11-99.

Soil Consultants, Inc.

| | | |
|---------------------------------|---|------------------------------------|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | ASTM - D 5084 |
| SCI Project: 99-680 | | Date: 5-17-99 |

SAMPLE IDENTIFICATION

| Tank 'K' | Tank 'K' | Tank 'K' |
|---|---|---|
| Density Test #1, 2nd Lift (Brown inorg. clay w/sl. sand) | Density Test #2, 2nd Lift (Brown inorg. clay w/sl. sand) | Density Test #3, 2nd Lift (Brown inorg. clay w/sl. sand) |

INITIAL CONDITIONS

| | | | |
|----------------------|--------|--------|-------|
| Sample Length, cm | 5.08 | 5.08 | 5.08 |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 |
| Moisture Content, % | 29.78% | 25.2% | 32.9% |
| Unit Wet Weight, pcf | 115.8 | 125.1 | 120.1 |
| Unit Dry Weight, pcf | 89.2 | 99.9 | 90.3 |
| Specific Gravity | 2.66 | 2.66 | 2.66 |
| Porosity % | 46.3% | 39.9% | 45.6% |
| Saturation, % | 91.9 | 101.2% | 104.5 |

FINAL CONDITIONS

| | | | |
|----------------------|-------|-------|-------|
| Sample Length, cm | 5.07 | 5.08 | 5.08 |
| Sample Diameter, cm | 5.14 | 5.08 | 5.08 |
| Moisture Content, % | 35.3% | 26.9% | 33.2% |
| Unit Wet Weight, pcf | 113.4 | 126.9 | 122.0 |
| Unit Dry Weight, pcf | 83.8 | 100.0 | 91.6 |
| Saturation, % | 95.6 | 108.0 | 108.6 |

TEST CONDITIONS

| | | | |
|--|------------------------|-----------------------|------------------------|
| Permeant | Potable Water | Potable Water | Potable Water |
| Cell Pressure, psi | 32 | 32 | 32 |
| Back Pressure, psi | 29-27 | 29-27 | 29-27 |
| B-value | 0.95 | 0.95 | 0.98 |
| Average Gradient | 28.3 | 28.3 | 28.3 |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 3.719×10^{-8} | 4.02×10^{-8} | 8.273×10^{-8} |

Undisturbed Specimens obtained 5-11-99.

Soil Consultants, Inc.

| | | | | |
|-----------------------------|-------------------------------|------------------------------------|--|--|
| Materials Testing Report | SOIL CONSULTANTS, INC. | | HYDRAULIC CONDUCTIVITY TEST ASTM - D 5084 | |
| | Client : | Supervisor of Shipbuilding C&R, US | | |
| | Project: | Chicora Tank Farm | | |
| SCI Project: 99-596 | | Date: 5-4-99 | | |

**Sample Identification
Description**

| | | | |
|--|--|--|--|
| Tank "L", 1st Lift, Test #1 | Tank "L", 1st Lift, Test #2 | Tank "L", 1st Lift, Test #3 | |
| Brown & tan inorg. clay with slight sand. | Brown & tan inorg. clay with slight sand. | Brown & tan inorg. clay with slight sand. | |

INITIAL CONDITIONS

| | | | | |
|----------------------|-------|-------|-------|--|
| Sample Length, cm | 5.08 | 5.08 | 5.08 | |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 | |
| Moisture Content, % | 16.4% | 18.2% | 16.9% | |
| Unit Wet Weight, pcf | 130.5 | 124.4 | 130.4 | |
| Unit Dry Weight, pcf | 112.1 | 105.3 | 111.6 | |
| Specific Gravity | 2.64 | 2.64 | 2.64 | |
| Porosity % | 31.9% | 36.0% | 32.3% | |
| Saturation, % | 92.3 | 85.0% | 93.7% | |

FINAL CONDITIONS

| | | | | |
|----------------------|--------|--------|--------|--|
| Sample Length, cm | 5.08 | 5.08 | 5.08 | |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 | |
| Moisture Content, % | 17.98% | 21.63% | 18.88% | |
| Unit Wet Weight, pcf | 132.3 | 125.4 | 132.2 | |
| Unit Dry Weight, pcf | 112.1 | 103.1 | 111.2 | |
| Saturation, % | 101.2 | 95.6 | 103.6 | |

TEST CONDITIONS

| | | | | |
|---|------------------------|------------------------|------------------------|--|
| Permeant | Potable Water | Potable Water | Potable Water | |
| Cell Pressure, psi | 32 | 32 | 32 | |
| Back Pressure, psi | 29-27 | 29-27 | 29-27 | |
| B-value | 0.98 | 0.95 | 0.100 | |
| Average Gradient | 28.3 | 28.3 | 28.3 | |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 9.986×10^{-7} | 9.859×10^{-7} | 9.606×10^{-7} | |

Undisturbed Samples obtained 4-26-99

SOIL CONSULTANTS, INC.



| | | |
|---------------------------------|------------------------------------|--|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST ASTM - D 5084 |
| Client : | Supervisor of Shipbuilding C&R, US | |
| Project: | Chicora Tank Farm | |
| SCI Project: 99-597 | Date: 5-4-99 | |

Sample Identification Description

| | | | |
|---|---|---|--|
| Tank "L", 2nd Lift, Test #1 | Tank "L", 2nd Lift, Test #2 | Tank "L", 2nd Lift, Test #3 | |
| Brown & tan inorg. clay with slight sand. | Brown & tan inorg. clay with slight sand. | Brown & tan inorg. clay with slight sand. | |

INITIAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Specific Gravity
Porosity %
Saturation, %

| | | | |
|--------|---------|-------|--|
| 5.6896 | 5.0546 | 5.08 | |
| 5.2324 | 5.08 | 5.08 | |
| 14.56% | 16.2 | 15.6 | |
| 121.2 | 135 | 127.8 | |
| 105.8 | 116.2 | 110.6 | |
| 2.64 | 2.64 | 2.64 | |
| 35.70% | 29.40% | 32.3% | |
| 69 | 102.60% | 84.3 | |

FINAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Saturation, %

| | | | |
|--------|--------|-------|--|
| 5.6896 | 5.0546 | 5.08 | |
| 5.2324 | 5.08 | 5.08 | |
| 20.70% | 17.7 | 19.9% | |
| 124.1 | 136.2 | 131.4 | |
| 102.8 | 115.7 | 109.6 | |
| 90.8 | 110.5 | 104.5 | |

TEST CONDITIONS

Permeant
Cell Pressure, psi
Back Pressure, psi
B-value
Average Gradient
Hydraulic Conductivity, cm/sec @ 20 deg. C

| | | | |
|-----------------------|------------------------|------------------------|--|
| Potable Water | Potable Water | Potable Water | |
| 42 | 32 | 42 | |
| 39-37 | 29-27 | 39-37 | |
| 0.100 | 0.100 | 0.960 | |
| 28.3 | 28.3 | 28.3 | |
| 9.64×10^{-7} | 9.312×10^{-7} | 9.493×10^{-7} | |

Undisturbed Samples obtained 4-27-99

SOIL CONSULTANTS, INC.

| | | |
|---------------------------------|---|------------------------------------|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | ASTM - D 5084 |
| CI Project: 99-898 | | Date: 6-18-99 |

SAMPLE IDENTIFICATION

| Tank 'M' | Tank 'M' | Tank 'M' |
|--|--|--|
| Density Test #1, 1st Lift (Gray inorg. clay w/sl. sand) | Density Test #2, 1st Lift (Gray inorg. clay w/sl. sand) | Density Test #3, 1st Lift (Gray inorg. clay w/sl. sand) |

INITIAL CONDITIONS

| | | | |
|----------------------|--------|--------|--------|
| Sample Length, cm | 4.826 | 5.08 | 5.08 |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 |
| Moisture Content, % | 28.80% | 31.0 | 24.80% |
| Unit Wet Weight, pcf | 115.3 | 114.9 | 121.7 |
| Unit Dry Weight, pcf | 89.5 | 87.7 | 97.5 |
| Specific Gravity | 2.66 | 2.66 | 2.66 |
| Porosity % | 46.00% | 47.20% | 41.20% |
| Saturation, % | 89.6 | 92.40% | 94.1 |

FINAL CONDITIONS

| | | | |
|----------------------|--------|-------|--------|
| Sample Length, cm | 4.826 | 5.08 | 5.08 |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 |
| Moisture Content, % | 29.80% | 34.3 | 27.00% |
| Unit Wet Weight, pcf | 117.3 | 116.6 | 122.3 |
| Unit Dry Weight, pcf | 90.4 | 86.8 | 96.2 |
| Saturation, % | 94.5 | 100 | 99.2 |

TEST CONDITIONS

| | | | |
|--|-----------------------|------------------------|------------------------|
| Permeant | Potable Water | Potable Water | Potable Water |
| Cell Pressure, psi | 32 | 32 | 32 |
| Back Pressure, psi | 29-27 | 29-27 | 29-27 |
| B-value | 0.95 | 0.970 | 0.100 |
| Average Gradient | 28.3 | 28.3 | 28.3 |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 1.79×10^{-5} | 1.055×10^{-6} | 1.495×10^{-6} |

Undisturbed Specimens obtained 6-16-99.

Soil Consultants, Inc.

| | | |
|---------------------------------|---|------------------------------------|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | ASTM - D 5084 |
| CI Project: 99-933 | | Date: 6-25-99 |

SAMPLE IDENTIFICATION

| Tank 'M' | Tank 'M' | Tank 'M' |
|---|--|--|
| Density Test #1, 2nd. Lift (Gray inorg. clay w/sl. sand) | Density Test #2, 2nd Lift (Gray inorg. clay w/sl. sand) | Density Test #3, 2nd Lift (Gray inorg. clay w/sl. sand) |

INITIAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Specific Gravity
Porosity %
Saturation, %

| | | |
|--------|--------|--------|
| 5.08 | 4.826 | 5.08 |
| 5.08 | 5.08 | 5.08 |
| 30.80% | 28.8 | 38.00% |
| 121.9 | 112.9 | 115.4 |
| 93.1 | 87.6 | 83.6 |
| 2.66 | 2.66 | 2.66 |
| 43.90% | 47.20% | 49.60% |
| 104.9 | 85.70% | 102.7 |

FINAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Saturation, %

| | | |
|--------|-------|--------|
| 5.08 | 4.826 | 5.08 |
| 5.08 | 5.08 | 5.08 |
| 31.45% | 42.2 | 45.10% |
| 124.7 | 116 | 117 |
| 94.9 | 81.5 | 80.6 |
| 111.5 | 108.3 | 113.2 |

TEST CONDITIONS

Permeant
Cell Pressure, psi
Back Pressure, psi
B-value
Average Gradient
Hydraulic Conductivity,
cm/sec @ 20 deg. C

| Potable Water | Potable Water | Potable Water |
|------------------------|------------------------|------------------------|
| 32 | 32 | 32 |
| 29-27 | 29-27 | 29-27 |
| 0.970 | 0.100 | 0.980 |
| 28.3 | 28.3 | 28.3 |
| 8.923×10^{-8} | 1.296×10^{-8} | 2.873×10^{-8} |

Undisturbed Specimens obtained 6-21-99.

Soil Consultants, Inc.

| | | | | |
|-----------------------------|-------------------------------|--------------------------------------|--|--|
| Materials Testing Report | SOIL CONSULTANTS, INC. | | HYDRAULIC CONDUCTIVITY TEST ASTM - D 5084 | |
| | Client : | Supervisor Of Shipbuilding C & R, US | | |
| | Project : | Chicora Tank "N" | | |
| SCI Project: 99-1129 | | Date: 7-29-99 | | |

**Sample Identification
Description**

| | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|--|
| S#1, 1st Lift Gray inorganic clay. | S#2, 1st Lift Gray inorganic clay. | S#3, 1st Lift Gray inorganic clay. | |
|---------------------------------------|---------------------------------------|---------------------------------------|--|

INITIAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Specific Gravity
Porosity %
Saturation, %

| | | | |
|-------|-------|-------|--|
| 5.08 | 4.94 | 5.08 | |
| 5.08 | 4.97 | 5.08 | |
| 23.0% | 27.2% | 28.4% | |
| 117.7 | 119.2 | 118.9 | |
| 95.7 | 93.7 | 92.6 | |
| 2.7 | 2.7 | 2.7 | |
| 42.6% | 44.3% | 45.0% | |
| 82.9 | 92.1 | 93.6 | |

FINAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Saturation, %

| | | | |
|-------|--------|-------|--|
| 5.08 | 4.9403 | 5.08 | |
| 5.08 | 4.9657 | 5.08 | |
| 32.3% | 31.5% | 34.5% | |
| 120.9 | 121.0 | 119.8 | |
| 91.4 | 92.0 | 89.1 | |
| 104.6 | 102.4 | 104.6 | |

TEST CONDITIONS

Permeant
Cell Pressure, psi
Back Pressure, psi
B-value
Average Gradient
Hydraulic Conductivity,
cm/sec @ 20 deg. C

| | | | |
|------------------------|------------------------|------------------------|--|
| Potable Water | Potable Water | Potable Water | |
| 42 | 42 | 32 | |
| 39-37 | 39-37 | 29-27 | |
| 0.100 | 0.100 | 0.97 | |
| 28.3 | 29.0 | 28.3 | |
| 4.734×10^{-7} | 9.572×10^{-8} | 9.947×10^{-8} | |

Remarks: Undisturbed core samples taken 7-21-99.

SOIL CONSULTANTS, INC.

| | | | | |
|-----------------------------|-------------------------------|--------------------------------------|--|--|
| Materials Testing Report | SOIL CONSULTANTS, INC. | | HYDRAULIC CONDUCTIVITY TEST ASTM - D 5084 | |
| | Client : | Supervisor Of Shipbuilding C & R, US | | |
| | Project: | Chicora Tank "N" | | |
| SCI Project: 99-1156 | | Date: 7-29-99 | | |

**Sample Identification
Description**

| | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|--|
| S#1, 2nd Lift Gray inorganic clay. | S#2, 2nd Lift Gray inorganic clay. | S#3, 2nd Lift Gray inorganic clay. | |
|---------------------------------------|---------------------------------------|---------------------------------------|--|

INITIAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Specific Gravity
Porosity %
Saturation, %

| | | | |
|-------|-------|-------|--|
| 4.91 | 4.99 | 5.08 | |
| 5.08 | 5.08 | 5.08 | |
| 23.6% | 25.9% | 25.7% | |
| 121.0 | 113.2 | 119.4 | |
| 97.9 | 89.9 | 95.0 | |
| 2.69 | 2.69 | 2.69 | |
| 41.6% | 46.4% | 43.3% | |
| 88.9 | 80.5 | 90.2 | |

FINAL CONDITIONS

Sample Length, cm
Sample Diameter, cm
Moisture Content, %
Unit Wet Weight, pcf
Unit Dry Weight, pcf
Saturation, %

| | | | |
|-------|-------|-------|--|
| 4.95 | 4.99 | 5.08 | |
| 5.08 | 5.08 | 5.08 | |
| 25.2% | 30.3% | 27.8% | |
| 122.9 | 117.5 | 122.2 | |
| 98.1 | 90.2 | 95.6 | |
| 95.7 | 94.6 | 99.2 | |

TEST CONDITIONS

Permeant
Cell Pressure, psi
Back Pressure, psi
B-value
Average Gradient
Hydraulic Conductivity,
cm/sec @ 20 deg. C

| | | | |
|------------------------|------------------------|------------------------|--|
| Potable Water | Potable Water | Potable Water | |
| 42 | 42 | 22 | |
| 39-37 | 39-37 | 19-17 | |
| 0.97 | 0.95 | 0.95 | |
| 29.2 | 28.8 | 28.3 | |
| 2.884×10^{-7} | 5.712×10^{-8} | 2.688×10^{-7} | |

Remarks: Undisturbed core samples taken 7-26-99.

SOIL CONSULTANTS, INC.

| | | |
|---------------------------------|---|--|
| Materials Testing Report | SOIL CONSULTANTS, INC. | HYDRAULIC CONDUCTIVITY TEST ASTM - D 5084 |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | |
| SCI Project: 99-1198 | | Date: 8-10-99 |

SAMPLE IDENTIFICATION

| | | |
|---|---|---|
| Tank 'O' Test #1, 1st Lift (gray inorganic clay w/sl. sand) | Tank 'O' Test #2, 1st Lift (gray inorganic clay w/sl. sand) | Tank 'O' Test #3, 1st Lift (gray inorganic clay w/sl. sand) |
|---|---|---|

INITIAL CONDITIONS

| | | | |
|----------------------|-------|-------|-------|
| Sample Length, cm | 4.64 | 5.0 | 5.08 |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 |
| Moisture Content, % | 23.1% | 32.2% | 36.8% |
| Unit Wet Weight, pcf | 109.4 | 119.1 | 113.7 |
| Unit Dry Weight, pcf | 88.8 | 90.1 | 83.1 |
| Specific Gravity | 2.70 | 2.70 | 2.70 |
| Porosity % | 47.2% | 45.8% | 50.6% |
| Saturation, % | 69.6 | 101.6 | 96.8 |

FINAL CONDITIONS

| | | | |
|----------------------|-------|-------|-------|
| Sample Length, cm | 4.64 | 5.0 | 5.08 |
| Sample Diameter, cm | 5.08 | 5.08 | 5.08 |
| Moisture Content, % | 37.8% | 33.3% | 40.8% |
| Unit Wet Weight, pcf | 112.4 | 121.0 | 115.1 |
| Unit Dry Weight, pcf | 81.6 | 90.8 | 81.7 |
| Saturation, % | 96.0 | 106.7 | 103.9 |

TEST CONDITIONS

| | | | |
|--|------------------------|------------------------|------------------------|
| Permeant | Potable Water | Potable Water | Potable Water |
| Cell Pressure, psi | 42 | 32 | 42 |
| Back Pressure, psi | 39-37 | 29-27 | 39-37 |
| B-value | 0.95 | 0.96 | 0.100 |
| Average Gradient | 31.0 | 29.0 | 28.3 |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 2.696×10^{-8} | 2.564×10^{-7} | 2.401×10^{-8} |

Undisturbed Specimens Obtained 8-4-99.

Soil Consultants, Inc.

| | | |
|---------------------------------|---|--|
| Materials Testing Report | SOIL CONSULTANTS, INC. | Hydraulic Conductivity Test ASTM - D 5084 |
| Project And Location: | Chicora Tank Farm North Charleston, S.C. | |
| SCI Project: 99-1267 | | Date: 8-18-99 |

SAMPLE IDENTIFICATION

| | | |
|---|---|---|
| Tank 'O' S #1, 2nd Lift (gray inorganic clay w/medium sand) | Tank 'O' S #2, 2nd Lift (gray inorganic clay) | Tank 'O' S #3, 2nd Lift (gray inorganic clay) |
|---|---|---|

INITIAL CONDITIONS

| | | | |
|----------------------|-------|-------|-------|
| Sample Length, cm | 5.33 | 5.21 | 5.02 |
| Sample Diameter, cm | 5.25 | 4.98 | 5.14 |
| Moisture Content, % | 24.2% | 35.3% | 36.2% |
| Unit Wet Weight, pcf | 116.7 | 108.5 | 105.7 |
| Unit Dry Weight, pcf | 94.0 | 80.1 | 77.7 |
| Specific Gravity | 2.66 | 2.71 | 2.71 |
| Porosity % | 43.5% | 52.6% | 54.1% |
| Saturation, % | 83.9 | 86.3 | 83.3 |

FINAL CONDITIONS

| | | | |
|----------------------|-------|-------|-------|
| Sample Length, cm | 5.33 | 5.21 | 5.02 |
| Sample Diameter, cm | 5.25 | 4.98 | 5.14 |
| Moisture Content, % | 30.0% | 42.0% | 49.0% |
| Unit Wet Weight, pcf | 118.9 | 110.4 | 107.0 |
| Unit Dry Weight, pcf | 91.5 | 77.8 | 71.8 |
| Saturation, % | 97.8 | 97.0 | 98.0 |

TEST CONDITIONS

| | | | |
|--|----------------------|-----------------------|-----------------------|
| Permeant | Potable Water | Potable Water | Potable Water |
| Cell Pressure, psi | 32 | 42 | 42 |
| Back Pressure, psi | 29-27 | 39-37 | 39-37 |
| B-value | 0.96 | 0.97 | 0.95 |
| Average Gradient | 20.1 | 27.6 | 28.7 |
| Hydraulic Conductivity, cm/sec @ 20 deg. C | 1.7×10^{-7} | 1.24×10^{-8} | 1.54×10^{-8} |

Undisturbed Specimens obtained 8-12-99.

Soil Consultants, Inc.

APPENDIX F

Petroleum Contaminated soil disposal manifests



OAKRIDGE LANDFILL
WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-25-99

Truck # 27

Driver's Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 40446

Tonnage: 33.78

Received By: [Signature]

Date: 8/25/99

3183 HWY 78, (POB 148), DORCHESTER, SC. 29437
TEL: 843-663-2607, FAX: 843-663-1700

FAX 84356333751

OAKRIDGE SCALEHOUSE

Aug. 31 . 99 6:48

OAKRIDGE LANDFILL
WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # **OR 9907018**
Expiration **10/26/99**

Generator: **ENVIRONMENTAL DETACHMENT CHARLESTON**

Account Number: **490-189**

Location/Address: **CHICORA TANK FARM CHARLESTON SC (10)**

Tele Number: **843-743-2821 EXT 212** Contact: **COPEWANNAMAKER**

Generator Signature: *Copewannamaker*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: **BUTLERWARE**

Date: 8-25-99

Truck # 23

Driver's Signature: *AC RICHMOND*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: **Oakridge Landfill DWP 130**

Description of Waste: **SOL / #6 FUEL OIL CONTAMINATED SOIL**

Ticket Number: 110453

Tonnage: 91.44

Received By: *[Signature]*

Date: 8/25/99

2183 HWY 78, (POB 148), DONCHESTER, SC 29537
TEL: 843-643-2807 FAX: 843-643-2808



OAKRIDGE LANDFILL
WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-25-99 Truck # 31

Driver's Signature: Shemar Bennett

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 110455 Tonnage: 29.64

Received By: [Signature] Date: 8/25/99

2183 HWY 75, (JOB 145), DORCHESTER, SC. 29437
TEL: 843-563-2607, FAX: 843-563-1108



OAKRIDGE LANDFILL
WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker



***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-25-99

Truck # 27

Driver's Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: HA505

Tonnage: 190.57

Received By: [Signature]

Date: 8/25/99

2183 HWY 78, (POB 145), DORCHESTER, SC. 29437

FAX 84356333751

OAKRIDGE SCRAPHOUSE

Aug. 31 '99 6:38



OAKRIDGE LANDFILL
WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-25-99

Truck # 23

Driver's Signature: A C RICHMOND

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 110518

Tonnage: 32.47

Received By: Y Carter

Date: 8/25/99

2145 HWY 76 (POB 145), DORCHESTER, SC. 29437
TEL: 843-663-2007, FAX: 843-663-4188

OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-25-99 Truck # 31

Driver's Signature: Shoman Bennett

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 1105216 Tonnage: 26.02

Received By: J Carter Date: 8/25/99

2123 HWY 75, (POB 145), DORCHESTER, SC 29437
TEL: 843-663-2807, FAX: 843-663-4188



OAKRIDGE LANDFILL
• WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # **OR 9907818**
Expiration **10/26/99**

Generator: **ENVIRONMENTAL DETACHMENT CHARLESTON**

Account Number: **490-189**

Location/Address: **CHICORA TANK FARM CHARLESTON SC (10)**

Tele Number: **843-743-2821 EXT 212** Contact: **COPEWANNAMAKER**

Generator Signature: *Copewannamaker*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: **BUTLERWARE**

Date: 8-25-99

Truck # 27

Driver's Signature: *Jim Moody*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: **Oakridge Landfill DWP 130**

Description of Waste: **SOL / #6 FUEL OIL CONTAMINATED SOIL**

Ticket Number: 110503

Tonnage: 35.08

Received By: *NCarter*

Date: 8/28/99

2123 HWY 78, (POB 140), DORCHESTER, SC, 29437
TEL: 843-863-2897. FAX: 843-863-2898

FAX B4356333751

OAKRIDGE SCALEHOUSE

Aug. 31 '99 6:36



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99 Truck # 17

Driver's Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108127 Tonnage: 33.71

Received By: N Carter Date: 8/4/98

2183 HWY 78, (POB 145), DORCHESTER, SC, 29437
TEL: 843-563-2607, FAX: 843-563-4158



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: [Signature]

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99

Truck # 27

Driver's Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108115

Tonnage: 33.73

Received By: [Signature]

Date: 8/11/99

2183 HWY 78, (POB 145), DORCHESTER, SC. 29437
TEL: 843-563-2607, FAX: 843-563-4158



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99 Truck # 17

Driver's Signature: M. Wright

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108097 Tonnage: 32.58

Received By: [Signature] Date: 08/04/99

2183 HWY 78, (POB 145), DORCHESTER, SC, 29437
TEL: 843-563-2607, FAX: 843-563-4158



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval# OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99

Truck # 27

Driver's Signature: Ann Moody

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108084

Tonnage: 30.22

Received By: [Signature]

Date: 8/4/99

2183 HWY 78, (POB 145), DORCHESTER, SC. 29437
TEL: 843-563-2607, FAX: 843-563-4158



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99

Truck # 27

Driver's Signature: Jimmy Moody

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108055

Tonnage: 32.77

Received By: [Signature]

Date: 8/4/99

2183 HWY 78, (POB 145), DORCHESTER, SC, 29437
TEL: 843-563-2607, FAX: 843-563-4158



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAHER

Generator Signature: Copes Wannamaker

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-98 Truck # 17

Driver's Signature: B. Wright

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108062 Tonnage: 32.12

Received By: [Signature] Date: 8/4/98

2183 HWY 78, (POB 145), DORCHESTER, SC. 29437
TEL: 843-563-3607, FAX: 843-563-4158



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 202 Contact: COPES WANNAMAKER

Generator Signature: [Signature]

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99 Track # 17

Driver's Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108152 Tonnage: 31.52

Received By: [Signature] Date: 8/4/99

2185 HWY 78, (POB 140), DORCHESTER, SC, 29437
TEL: 843-563-2697, FAX: 843-563-4188



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE MANIFEST

Approval # OR 9907018
Expiration 10/26/99

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-189

Location/Address: CHICORA TANK FARM CHARLESTON SC (10)

Tele Number: 843-743-2821 EXT 212 Contact: COPES WANNAMAKER

Generator Signature: [Signature]

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLERWARE

Date: 8-4-99

Truck # 22

Driver's Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / #6 FUEL OIL CONTAMINATED SOIL

Ticket Number: 108147

Tonnage: 30.33

Received By: [Signature]

Date: 8/4/99

2185 HWY 78, (POB 148), DORCHESTER, SC, 29437
TEL: 843-563-2807, FAX: 843-563-4158