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Supplemental Remedial Investigation

**Southern Wood Piedmont Company
and
North Carolina State Ports Authority
Site
Wilmington, New Hanover County,
North Carolina**

Prepared For

**Southern Wood Piedmont
Company
Spartanburg, South Carolina**

Prepared By



October 30, 2001

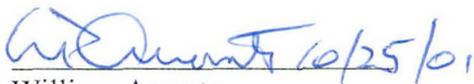
CERTIFICATION

In Southern Wood Piedmont Company's and Schnabel Engineering Associates, Inc. opinion and to the best of our knowledge and belief all information known or in possession or control of its officers, directors, employees, contractors, and agents has been fully and accurately disclosed which relates in any way to existing contamination or past release of contaminants at the site.

This report has been prepared solely and exclusively for Southern Wood Piedmont Company's and NCDENR's benefit and use for specific application to this project. The use of this report by a third party or parties will be at such party's sole risk and Schnabel Engineering Associates disclaims liability for any such use or reliance by third parties.

This report presents an assessment of the existing environmental conditions at the site based on conditions at the time of our evaluation and available information provided by other parties. Generally, information obtained from others is reliable. However, Schnabel Engineering Associates cannot warrant or guarantee information to be correct or accurate that was collected and/or provided by others.

The analysis and findings submitted in this report are based, in part, upon data obtained from subsurface exploration. The nature and extent of variations between boring and sampling locations may not be evident. Analysis and findings of this report are based on interpolation between data points and may not be representative of all subsurface conditions. Regardless of the thoroughness of an environmental assessment, there is always the possibility that conditions between borings are different from those at specific boring locations due to variability of subsurface conditions.


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Southern Wood Piedmont Company


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LIST OF ABBREVIATIONS

AOC	Administrative Order on Consent
AVS-SEM	Acid Volatile Sulfide-Semi-Extractable Metals
AWQS	EPA Ambient Water Quality Criteria
BIO	Biological Sample
CCA	Chromium, Copper, & Arsenic
CoC	Constituents of Concern
COPC	Chemicals of Potential Concern
COPEC	Chemical of Potential Ecological Concern
DNAPL	Dense Non-Aqueous Phase Liquid
DW	Dry Weight
DWQ	Division of Water Quality
EISOPQAM	Environmental Investigations Standard Operating Procedures & Quality Assurance Manual
ERA	Ecological Risk Assessment
ESI	Expanded Site Investigation
H&S	Health and Safety Plan
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IDW	Investigation Derived Waste
IHSP	Inactive Hazardous Sites Program
KG	Kilograms
L	Liters
LF1	Landfarm One
LF2	Landfarm Two
MCL	Maximum Concentration Limit
MCLG	Maximum Concentration Limit Goal
MDL	Method Detection Limit
MG	Milligrams
MW	Monitoring Well
NCDENR	North Carolina Department of Environment and Natural Resources
NCSPA	North Carolina State Ports Authority
NTA	Non-Treated Wood Storage Area A
NTB	Non-Treated Wood Storage Area B
PAHs	Polynuclear Aromatic Hydrocarbons
PCDDs	Polychlorinated Dibenzodioxins
PCDFs	Polychlorinated Dibenzofurans
PCP	Pentachlorophenol
PDA	Production Area
PE	Personal Protective Equipment
PPM	Parts Per Million
PQL	Practical Quantitation Limit
PRG	Preliminary Remediation Goals

RAP	Remedial Action Plan
RBC	Risk-Based Concentration Table
REF	Reference
RI	Remedial Investigation
RIR	Remedial Investigation Report
S&A	Sampling and Analysis Plan
SEA	Schnabel Engineering Associates
SLERA	Screening Level Ecological Risk Assessment
SOP	Standard Operating Procedures
SQGs	Sediment Quality Guidelines
SRIR	Supplemental Remedial Investigation Report
SRIW	Supplemental Remedial Investigation Workplan
SVOC	Semi-Volatile Organic Compounds
SW	Surface Water Sample
SWP	Southern Wood Piedmont
TCDD	2,3,7,8-Tetrachlorodibenzodioxins
TEF	Toxicity Equivalent Function
TEQ	Toxicity Equivalent Quotient
TICs	Tentatively Identified Compounds
TOC	Total Organic Carbon
TWSA	Treated Wood Storage Area A
TWSB	Treated Wood Storage Area B
QAP	Quality Assurance Plan
VOC	Volatile Organic Compounds
UG	Micrograms
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WQS	Water Quality Standards

**SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
SOUTHERN WOOD PIEDMONT AND
NORTH CAROLINA STATE PORTS AUTHORITY SITE
WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA**

NCD 058 517 467

EXECUTIVE SUMMARY

Schnabel Engineering Associates, Inc. (SEA) submitted a Draft Remedial Investigation Report (RIR) on June 24, 1999 for the Southern Wood Piedmont (SWP) and North Carolina State Ports Authority (NCSPA) site to the North Carolina Department and Environment and Natural Resources (NCDENR). SWP was directed to submit a Supplemental RI Workplan (SRIW) to address additional sampling requirements necessary to complete the remedial investigation activities at the site. On May 25, 2000 SEA submitted the SRIW to NCDENR for review. NCDENR approved the SRIW on September 20, 2000. Fieldwork began on October 23, 2000.

The scope of this investigation included the following activities:

- DNAPL quantity, extent, and pumpability in the shallow and intermediate sandy aquifers.
- Groundwater sampling and flow evaluation for the shallow, intermediate and deep aquifers.
- Adjacent property groundwater flow and quality characterization.
- Dibenzodioxins/dibenzofurans subsurface soil, groundwater, and sediment sampling.
- Sediment sampling in wetland areas, drainage ditch, Greenfield Creek, and Cape Fear River.
- Fish sampling in drainage ditch, Greenfield Creek, Greenfield Lake, and Burnt Mill Creek.
- Human Health Risk Assessment.
- Ecological Risk Assessment.
- Ecotoxicity Assessment of drainage ditch and Greenfield Creek.
- Land Use Restrictions Consent from NCSPA.
- Verification and reference of environmentally sensitive areas.

Chevron USA Products Company was formerly located along the south bank of Greenfield Creek. Chevron stored and distributed asphalt compounds and petroleum naphtha. Volatile organic and polycyclic aromatic hydrocarbons (PAHs) contamination has been identified in the soil and groundwater at this site. This site as changed operations name from Chevron to PakTank to VOPAK.

A semi-volatile source exists 0.7 miles upstream from the site in the Cape Fear River at the former Wilmington Coal Gas Plant Site, NCD 986 188 910. Sediment sample SS-14 collected from the Cape Fear River at the boat landing beneath Highway 74 confirmed the presence of semi-volatile constituents at this location.

The shallow aquifer potentiometric map shows a central elongate water table mound with its highest elevation to the northeast on the Amerada Hess property (Figure 1). From this elongate

groundwater mound, the groundwater flows off in all directions toward on-site drainage ditches, Greenfield Creek and the Cape Fear River. The groundwater in vicinity of Optimist Park flows to the west toward the on-site drainage ditch. The groundwater in the vicinity of Chevron flows to the north toward Greenfield Creek.

The intermediate aquifer potentiometric map also shows a central elongate water table mound with its highest elevation to the northeast on the Amerada Hess property (Figure 5). From this elongate groundwater mound, the groundwater flows to the west and southwest toward the Cape Fear River and to the southeast toward the drainage ditch and Greenfield Creek. The Cape Fear River has been dredged to a depth equivalent to the bottom of the intermediate aquifer. As such, the intermediate aquifer is in complete hydraulic connection with the Cape Fear River. The elevation head of the Cape Fear River provides the force that drives groundwater flow in the intermediate aquifer. In the vicinity of the covered ditch it appears that the groundwater flow in the intermediate aquifer is under the drainage ditch toward Optimist Park. However, a slight gradient to the west back toward the site exists between MW-38 and MW-28A in Optimist Park.

The deep aquifer potentiometric map indicates a groundwater flow direction to the southwest toward the Cape Fear River (Figure 9).

No sensitive environments exist at the site except for wetland areas. At Greenfield Lake just east of the site are the following sensitive environments:

Plants:

Carolina grasswort (*Lilaeopsis carolinensis*) – State Threatened

Animals:

Magnificent rams-horn (*Planorbella magnifica*) – State Endangered and Federal Species of Concern

Greenfield rams-horn (*Helisoma eucosmium*) – State Significantly Rare and Federal Species of Concern

Barrel floater (*Anodonta couperiana*) – State Endangered

American alligator (*Alligator mississippiensis*) – State Threatened and Federal Threatened Due to Similarity of Appearance

Fishes:

Least killifish (*Heterandria formosa*) – State Special Concern

The three mollusks have not been found in recent decades and are apparently extirpated.

Several rare species are present in the Cape Fear River, just to the west of the site. In addition to the American alligator, also present are:

Animals:

Manatee (*Trichechus manatus*) – State and Federal Endangered

Fishes:

Shortnose sturgeon (*Acipenser brevirostrum*) – State and Federal Endangered

The Cape Fear River is also a Migratory Pathway for the Shortnose Sturgeon, Stripped Bass, American Shad, Hickory Shad, Blueback Herring, and the Alewife Herring.

Constituents that exceed Preliminary Remediation Goals (PRGs) for each media at the site are summarized below:

<u>CONSTITUENTS</u>	<u>SOIL</u>	<u>GW</u>	<u>SEDIMENT</u>	<u>SW</u>	<u>FISH</u>
<u>Semi-Volatiles</u>					
2,4-Dimethylphenol	-	X	-	-	-
2-Chlorophenol	-	X	-	-	-
2-Methylnaphthalene	-	X	X	-	-
2-Methylphenol (o-Cresol)	-	X	-	-	-
3-and/or 4-Methylphenol (m&p-Cresol)	-	X	-	-	-
Acenaphthene	-	X	-	-	-
Benzo(a)anthracene	X	X	X	-	-
Benzo(a)pyrene	X	X	X	-	-
Benzo(b)fluoranthene	X	X	X	-	-
Benzo(k)fluoranthene	X	X	-	-	-
Bis(2-ethylhexyl)Phthalate	-	X	-	-	-
Carbazole	-	X	-	-	-
Chrysene	-	X	X	-	-
Dibenzo(a,h)anthracene	X	X	-	-	-
Dibenzofuran	X	X	-	-	-
Fluoranthene	X	X	-	-	-
Fluorene	X	X	-	-	-
Indeno(1,2,3-cd)pyrene	-	X	X	-	-
Naphthalene	-	X	X	-	-
Pentachlorophenol	X	X	-	-	-
Phenanthrene	X	X	-	-	-
Phenol	-	X	-	-	-
Pyrene	-	X	-	-	-
<u>Volatiles</u>					
1,1,2,2-Tetrachloroethane	-	X	-	-	NA
Acetone	-	X	-	-	NA
Benzene	-	X	-	-	NA
Bromodichloromethane	-	X	-	-	NA
Chloroform	-	X	-	-	NA
Dichloromethane (Methylene Chloride)	-	X	-	-	NA
Ethylbenzene	-	X	-	-	NA

<u>CONSTITUENTS</u>	<u>SOIL</u>	<u>GW</u>	<u>SEDIMENT</u>	<u>SW</u>	<u>FISH</u>
<u>Inorganics</u>					
Aluminum	-	-	X	-	NA
Arsenic	X	X	X	-	-
Chromium	-	X	-	-	-
Copper	-	-	-	X	-
Iron	X	X	X	X	NA
Lead	X	X	X	-	NA
Magnesium	X	-	-	-	NA
Manganese	-	X	-	-	NA
Potassium	X	-	-	-	NA

Pesticides/PCBs

PCB-1260 (Aroclor 1260)	-	-	-	X	NA
Alpha-Chlordane/2	-	-	-	X	NA

Dioxins and Furans

123678-HxCDD	-	X	-	NA	-
123789-HxCDD	-	X	-	NA	-
1234678-HpCDD	X	X	-	NA	-
OCDD	X	X	-	NA	-
23478-PeCDF	-	X	-	NA	-
123478-HxCDF	-	X	-	NA	-
123789-HxCDF	-	X	-	NA	-
1234678-HpCDF	X	X	-	NA	-
OCDF	-	X	-	NA	-
2378-TCDD TEQ	X	-	X	NA	-

Notes:

- X Constituents detected at a concentration that exceeds the PRG.
- Constituent analyzed but did not exceed the PRG.
- NA Constituent not analyzed.
- GW Groundwater
- SW Surface water

Surface Water

PCB and Alpha-Chlorodane/2 detected in upgradient surface water samples in Greenfield Creek at a concentration that exceeds the PRG. These contaminants are not wood-treatment-related constituents. Copper was detected at a background concentration that exceeds the PRG in all surface water samples from the Cape Fear River, drainage ditch, and Greenfield Creek. The cyanide and iron PRG exceedance are not attributable to the site.

Groundwater

Acetone and dichloromethane (methylene chloride) in the groundwater are considered laboratory contaminants and not site-related constituents. Filtered samples indicated no PRG exceedance for dioxin/furans in the groundwater. Bromodichloromethane (deep aquifer) and chloroform (intermediate and deep aquifers) were only detected in the intermediate and deep aquifers adjacent to Greenfield Creek. These constituents are not site-related.

Sediments

Aluminum, iron and lead in sediment are not site constituents. They are considered naturally occurring background concentrations, not PRG exceedance. Sediment samples did not exceed the PRG for individual dioxin/furan congeners, however, the PRG for the 2378-TCDD TEQ was exceeded.

Soil

Dibenzofuran, fluoranthene, fluorene, and phenanthrene exceeded the PRG at only one subsurface soil location (SB-08). Pentachlorophenol exceeded the PRG only once in landfarm 2 (1991) subsurface soil. Calcium, iron, magnesium, potassium, and cyanide are not site-related constituents. Lead exceeded the PRG only in surface soil sampled from the onsite roadbeds (1993

A Voluntary Consent for Land Use Restrictions form has been signed and notarized by the North Carolina State Ports Authority. It is proposed that NCDENR review and approve alternate soil and sediment remediation goals based on a restricted land-use exposure scenario.

Site-specific restricted land use soil PRGs have been exceeded in the surface and subsurface soil in the treated wood storage areas, landfarm area, production area, and covered ditch area (Figures 16, 17, 18 and 19). Inorganic concentrations appear to be naturally occurring, except in the drip track area in front of the former CCA treatment area. Dioxin and furan soil preliminary remediation goal exceedance is limited to the landfarms and the production area (Figures 17 and 19).

In addition to meeting "health-based" remediation goals, soils must meet a "protection-of-groundwater" remediation goal. Since no TCLP data or site-specific mathematical equations have been completed for the site the "protection-of-groundwater" soil remedial is set at twenty times the groundwater remediation goal. However, it is suggested that the "protection-of-groundwater" remediation goal only apply to soil located on-site within the extent of groundwater impact. The DNAPL extent map (Figure 24) and groundwater PRG maps presented on Figures 20, 21, 22 and 23 indicate the areas in which "protection-of-groundwater" soil remediation goals would apply.

Two groundwater plumes are present at the site. The plumes originate from the landfarm and from the large storage tank, the production, and the covered ditch areas. Constituents from the

large storage tank area appear to be migrating toward the Cape Fear River. Constituents from the production and covered ditch areas appear to have migrated to the drainage ditch and Greenfield Creek. The eastern extent of this plume appears to have migrated off-site onto Optimist Park and the City of Wilmington pump station. The off-site constituents have all been detected at estimated concentrations (noted as "J" values on the laboratory reports) below the practical quantitation limit (PQL). Raw sewage was discharged to the Cape Fear River through a shallow 24-inch diameter pipe from what is now the City of Wilmington pump station adjacent to Optimist Park. The head of this pipe is located immediately adjacent to MW-37, MW-38 and MW-39. The downgradient extent of the groundwater plume appears to be in the vicinity of MW-34, MW-35 and MW-36 along Greenfield Creek. Documented groundwater contamination is present on the former Chevron bulk asphalt chemical storage facility located on the south bank of Greenfield Creek. The landfarm plume appears to be migrating to the west/northwest toward the Cape Fear River and the drainage ditch along the northern property boundary.

During this investigation groundwater samples from five shallow aquifer monitoring wells on the site (Figure 21) were analyzed for dioxins/furans. Preliminary remediation goals were exceeded at all five wells. Filtered samples were collected at upgradient well MW-17 and at the worst case well MW-12. In both filtered samples the results are below the dioxin/furan preliminary remediation goals. Using the filtered data results from the worst case well (MW-12) as an indicator, it can be assumed that all wells would be below the dioxin/furan PRGs for the site.

The highest elevation of the top of the peat unit is southeast of the covered ditch in the wetland area and the along the drainage ditch. From this area the top of the peat slopes to the west toward the Cape Fear River. Topographic lows are located in the vicinity of the covered ditch, the production area and the large storage tank area. DNAPL has pooled on top of the peat beneath the large storage tank area, the production area, and the covered ditch. It appears that the DNAPL has migrated through the peat layer and has begun to accumulate on top of the lower clay in the intermediate aquifer.

Since the net discharge of groundwater is to the surrounding surface water bodies it is believed that the sediments are not causing groundwater contamination. Because no semi-volatile or volatile constituents, and only limited inorganics, at background levels, have been detected in the surface water adjacent to the site, it is believed that the sediments are also not causing surface water contamination. Preliminary "health-based" sediment remediation goals have been exceeded for arsenic at SD-24 located along the drainage ditch near non-treated wood storage area B. PRGs for benzo(a)pyrene and benzo(b)fluoranthene were exceeded in Greenfield Creek at SS-10 next to the documented groundwater impact at the former Chevron facility. Dioxins/Furans exceeds the sediment PRG at SD-26 and SD-28 in the drainage ditch below the covered ditch (Figure 27).

All of the surface water samples have historically been below surface water PRGs except for copper, cyanide, iron, manganese, PCB-1260 and Alpha-Chlordane/2. The greatest concentrations detected for copper, cyanide, iron, and manganese occurred in the background surface water sample SW-01 near the entrance to the site. PCB-1260 and Alpha-Chlorodane/2 were detected in Greenfield Creek at the background sample location, and in the drainage ditch,

Greenfield Creek and the Cape Fear River. These two constituents are not considered site-related constituents and are considered to represent background concentrations for the area.

Fish samples were collected from Burnt Mill Creek, Greenfield Lake, Greenfield Creek, and the on-site drainage ditch for dioxins/furans, semi-volatiles and inorganics (Figures 30 and 31). The results from the fish analyses were compared to the USEPA Region III Risk-Based Concentration Table (April, 2000) for fish ingestion. All results are below the Risk-Based Concentration for each constituent of concern.

A point-by-point comparison of "human-health" risk-based concentrations with site media concentrations revealed that there are some exceedances of individual receptor- and media-specific risk-based concentrations. Nevertheless, it must be recognized that an individual would not, in all probability, be exposed at one unique location. Thus, a point-specific exceedance does not, in and of itself, constitute a potential cause for concern given the likelihood that true human exposures would more realistically occur over an area (and thus would be more indicative of exposure to site-wide average chemical concentrations).

Four Assessment Endpoints and eight Measurement Endpoints were used to assess the potential ecological risks at the Site. Receptors of interest include benthic invertebrates, fish, upper trophic level piscivorous birds (i.e., great blue heron), upper trophic level carnivorous birds (i.e., red-tailed hawk), and upper trophic level piscivorous mammals (i.e., mink).

Weight-of-evidence and determination of the Ecological Significance and Relevance of the ecological risk assessment results was performed. Based on these results, the upper trophic level populations are not predicted to be at a significant risk. However, since the sediments within the drainage ditch and Greenfield Creek are exhibiting toxicity, and the lower trophic level community serve indirectly as a prey base for the evaluated higher trophic levels, consideration to improving sediment quality in this area would enhance the desirable upper trophic level receptor populations. However, any corrective action, should be weighted against probable future use of the Site by the North Carolina State Ports Authority and the effect that remedial activities may have on sensitive environments.

Toxicity assays were completed on sediment samples obtained from the drainage ditch and Greenfield Creek. The amphipod and the midge did not survive in the drainage ditch sediments. They survived in Greenfield Creek, except at the location of the former Chevron facility.

**SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
SOUTHERN WOOD PIEDMONT AND
NORTH CAROLINA STATE PORTS AUTHORITY SITE
WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA**

NCD 058 517 467

Schnabel Engineering Associates, Inc. (SEA) submitted a Draft Remedial Investigation Report (RIR) on June 24, 1999 for the Southern Wood Piedmont (SWP) and North Carolina State Ports Authority (NCSPA) site to the North Carolina Department and Environment and Natural Resources (NCDENR). SWP was directed to submit a Supplemental RI Workplan (SRIW; Ref 1) to address additional sampling requirements necessary to complete the remedial investigation activities at the site. On May 25, 2000 SEA submitted the SRIW to NCDENR for review. NCDENR approved the SRIW on September 20, 2000 (Ref 2). Fieldwork began on October 23, 2000. This Supplemental Remedial Investigation Report (SRIR) presents our findings from the SRIW.

The requirements and presentation order for RI reporting is listed in the May 24, 1999 Administrative Order on Consent (AOC). Following submittal and review of the RI report by NCDENR, it was agreed that the RI deficiencies could be addressed as an addendum to the RI report. As such, the section headings and numerical order presented in this report match the section headings listed in the RI report. All major sections include a statement indicating if any deficiencies in the RI report were noted. All deficiencies are discussed in the pertinent sections of the report. Subsection headings reflect the heading numbers in the RI report.

The scope of this investigation included the following activities:

- DNAPL quantity, extent and pumpability evaluation in the shallow and intermediate sandy aquifers.
- Groundwater sampling and tidal groundwater flow evaluation for the shallow, intermediate and deep aquifers.
- Adjacent property owner's data request concerning groundwater flow and quality to further characterize groundwater conditions at the site.
- Dibenzodioxins/dibenzofurans subsurface soil, groundwater and sediment sampling.
- High-resolution (closer spacing) sediment sampling for detected constituents in wetland areas south of the covered ditch and along the drainage ditch and Greenfield Creek.
- Fish tissue sampling in the drainage ditch, Greenfield Creek, Greenfield Lake and Burnt Mill Creek.
- Update the Human Health Risk Assessment to reflect new sample results and applicable land use changes.
- Update the Ecological Risk Assessment to maintain consistency with the USEPA 1997 guidance and reflect new sample results.
- Ecotoxicity Testing and Chronic Exposure Assessment of drainage ditch and Greenfield Creek.

- Initial evaluation of technical feasibility of DNAPL reduction.
- Initial efforts in obtaining Perpetual Land Use Restrictions in accordance with 2001 guidelines.
- Modifications to the Draft RI as presented in the Technical Comments section of the September 3, 1999 NCDENR review and comment letter.
- Verification and reference documentation of the absence of environmentally sensitive areas.

1.0 SITE LOCATION

No deficiencies were noted in the RIR.

The Chevron USA Products Company site located along the south bank of Greenfield Creek was historically used for the storage and distribution of asphalt and petroleum naphtha. Volatile organic and polycyclic aromatic hydrocarbons (PAHs) contamination has been identified in the soil and groundwater at this site (Ref. 3). This site has changed operations name from Chevron to PakTank to VOPAK. The VOPAK site consists of two parcels. The southern parcel is owned by NCSPA and leased to VOPAK and the northern parcel is owned VOPAK. Chevron has retained liability for environmental impact on their portion of the property that was purchased by VOPAK.

2.0 MANAGEMENT PRACTICE

No deficiencies were noted in the RIR.

3.0 USGS TOPOGRAPHIC MAP

No deficiencies were noted in the RIR.

4.0 SURVEY PLAT

No deficiencies were noted in the RIR.

5.0 HYDROGEOLOGIC CONDITIONS

5.5 Site Specific Hydrogeology

ViroGroup, Inc. completed multiple (15) slug tests in the shallow aquifer in 1992 during the Phase II groundwater quality assessment. Law Environmental in 1985 calculated a hydraulic conductivity range for the peat. These slug tests were completed on wells that do not fully penetrate the respective aquifer. However, the calculated hydraulic conductivities from the slug are consistent with the composition of the aquifer materials.

5.6 Tidal Effects

The Upper Sandy Aquifer System, that consists of the shallow aquifer, peat and intermediate aquifer, is tidally influenced. Groundwater elevations in the shallow and intermediate aquifers

fluctuate with the rising and falling water levels in the Cape Fear River. These changes are described in detail in the RIR and were re-evaluated using data collected in February 2001.

Changes in groundwater flow due to tidal fluctuations were evaluated by measuring groundwater elevations in 74 monitoring wells and 5 staff gauges during a full tidal cycle on February 20, 2001. Eight of the monitoring wells are located on the Amerada Hess facility north of the site (Ref. 4) and 13 of these wells are located on the Chevron/VOPAK facility south of the site across Greenfield Creek (Ref. 3). Please refer to Table 1 for a summary table of the groundwater elevations measured on February 20, 2001.

5.6.1 *Shallow Aquifer*

The low tide shallow aquifer map (2/20/01 @ 13:00) shows a central elongate water table mound with its highest elevation to the northeast on the Amerada Hess property (Figure 1). From this elongate groundwater mound, the groundwater flows off in all directions toward on-site drainage ditches, Greenfield Creek, and the Cape Fear River. The groundwater in the central portion of the site is at its highest elevation during low tide in the Cape Fear River (measured at staff gauge at former on-site T-Head). This is likely the result of a delayed propagation of the increased heads (elevation) in the water table from high tide along the Cape Fear River migrating to the central portion of the site. The groundwater in vicinity of Optimist Park flows to the west toward the on-site drainage ditch. The groundwater in the vicinity of Chevron flows to the north toward Greenfield Creek. A steep potentiometric surface gradient occurs in close proximity to the surrounding surface water bodies that flattens toward the interior of the site. The tidal gate at the mouth of Greenfield Creek is open allowing flow from the creek to the river. Flow in the river is to the north. Flow in the drainage ditch and upper stretches of the creek are stagnant.

Please refer to Figures 2 through 4 for a pictorial illustration of water table changes in the shallow aquifer across a full tidal cycle. Presented in the following paragraphs are only the changes in the groundwater flow relative to the low tide flow pattern discussed above. If a flow characteristic is not discussed then it can be assumed that no significant change as occurred.

During the rising tide between low and high tide (2/20/01 @ 16:00) the surface water elevation increased 2.99 feet in the Cape Fear River and dropped between 0.3 and 0.8 feet (measured at staff gauges at tidal gate and near MW-34) in Greenfield Creek (Figure 2). Surface water continued to discharge from the creek to the river until the river water elevation exceeded the water elevation in the creek. At this point the tidal gate closed preventing flow of the river water into the creek. The tidal gate dams the creek during times in which the river water elevation is greater than the creek water elevation (two-thirds of the time). At this time most of the flow to the creek is discharge from Greenfield Lake and groundwater seepage from the shallow aquifer. However, some leakage from the river into the creek was observed through the sidewalls of the tidal gate and when grass and debris prevent the tidal gate from sealing tight. Surface water flow in the creek is toward the Cape Fear River. The steepest potentiometric surface gradient is formed in the shallow aquifer along the banks of the creek and ditch at this time in the tidal cycle. This coincides with the lowest elevations of the surface water in the creek. Surface water flow in the Cape Fear River is to the north. The hydraulic gradient along the bank of the Cape Fear River has switched directions and groundwater flow is from the river into the shallow

aquifer. However, groundwater flow in the central portion of the site is still toward the Cape Fear River but at a lesser gradient.

During high tide (2/20/01 @ 7:00) the surface water elevation increased 4.22 feet from low tide in the Cape Fear River (Figure 3). In the creek the surface water elevation increased 0.57 feet at the tidal gate and 0.18 feet near MW-34 from the lowest elevation measured in Greenfield Creek. The tidal gate was closed preventing open discharge of the river to the creek. Most of the flow to the creek is from discharge from Greenfield Lake and groundwater seepage from the shallow aquifer. Surface water flow in the creek and the ditch is toward the Cape Fear River. A steep potentiometric surface gradient into the creek is present in the shallow aquifer along the banks of the creek and ditch. Surface water flow in the Cape Fear River is stagnant. The hydraulic gradient along the bank of the Cape Fear River has increased is from the river into the shallow aquifer. Groundwater flow in the central portion of the site is still toward the Cape Fear River.

During the falling tide between high and low tide (2/20/01 @ 10:00) the surface water elevation decreased 1.32 feet from high tide in the Cape Fear River (Figure 4). In the creek the surface water continued to increased in elevation 0.33 feet at the tidal gate and near MW-34. The tidal gate was closed damming the creek. Surface water flow in the creek and the ditch is toward the Cape Fear River. A steep hydraulic gradient is present in the shallow aquifer along the banks of the creek and ditch. Surface water flow in the Cape Fear River is to the south. The hydraulic gradient along the bank of the Cape Fear River has flattened and is from the river into the shallow aquifer near the tidal gate and from the shallow aquifer into the river along the northern most portion of the site. Groundwater flow in the central portion of the site remains toward the Cape Fear River.

5.6.2 *Intermediate Aquifer*

The low tide intermediate aquifer map (2/20/01 @ 13:00) shows a central elongate water table mound with its highest elevation to the northeast on the Amerada Hess property (Figure 5). From this elongate groundwater mound, the groundwater flows to the west and southwest toward the Cape Fear River and to the southeast toward the drainage ditch and Greenfield Creek. The groundwater in the central portion of the site is at its highest elevation during low tide in the Cape Fear River. This is likely the result of a delayed propagation of the increased heads (elevation) in the water table from high tide along the Cape Fear River migrating to the central portion of the site. The Cape Fear River has been dredged to a depth equivalent to the bottom of the intermediate aquifer. As such, the intermediate aquifer is in complete hydraulic connection with the Cape Fear River. The surface water elevation in the Cape Fear River provides the force that drives groundwater flow in the intermediate aquifer in the vicinity of the site. During low tide the groundwater in the intermediate aquifer from the central portion of the site flows to the west toward the river and to the southeast toward Greenfield Creek. A steep groundwater gradient occurs in close proximity to the river that flattens toward the interior of the site. In the vicinity of the covered ditch it appears that the groundwater flow in the intermediate aquifer is under the drainage ditch toward Optimist Park. However, a slight gradient to the west back toward the site exists between MW-38 and MW-28A in Optimist Park. An upward vertical hydraulic gradient from the intermediate aquifer to the shallow aquifer exists along the Cape Fear River, Greenfield Creek, drainage ditch, covered ditch and the landfarm. A downward

vertical gradient exists along the centerline of the elongate groundwater mound in the intermediate aquifer at the central portion of the site.

Please refer to Figures 6 through 9 for a pictorial illustration of groundwater elevation changes in the intermediate aquifer across a full tidal cycle. In the following paragraphs only changes in the groundwater flow in the intermediate aquifer relative to the low tide flow pattern are discussed. If a flow characteristic is not discussed then it can be assumed that no significant change has occurred.

During the rising tide between low and high tide (2/20/01 @ 16:00) the surface water elevation increased 2.99 feet in the Cape Fear River (Figure 6). Surface water flow in the Cape Fear River is to the north. The hydraulic gradient along the bank of the Cape Fear River is flattened, but still flows toward the river from the north-central portion of the site. Along the southern portion of the site adjacent to the Cape Fear River it appears that the groundwater flow has switched directions and now flows from the river into the intermediate aquifer to the east. The hydraulic gradient between MW-38 and MW-28A in Optimist Park has increased to the west. The vertical hydraulic gradient changes from upward to downward adjacent to the river at MW-8/8A and at MW-31/32.

During high tide (2/20/01 @ 7:00) the surface water elevation increases 4.22 feet from low tide in the Cape Fear River (Figure 7). Surface water flow in the Cape Fear River is stagnant. The elongate mound running through the central portion of the site changes configuration and is only present on the northern portion of the site and on the Amerada Hess property. Due to the increase in surface water elevation the hydraulic gradient in the intermediate aquifer adjacent to the river increases significantly and groundwater flow is now to the southeast across the site. The hydraulic gradient back toward the site to the west between MW-38 and MW-28A in Optimist Park is decreased. The vertical hydraulic gradient changes back to upward adjacent to the river at MW-8/8A and at MW-31/32.

During the falling tide between high and low tide (2/20/01 @ 10:00) the surface water elevation decreased 1.32 feet from high tide in the Cape Fear River (Figure 8). Surface water flow in the Cape Fear River is to the south. The elongate mound running through the central portion of the site is more pronounced and extends further south toward Greenfield Creek. Due to the decrease in surface water elevation the hydraulic gradient adjacent to the river is reversed and now flows back toward the river. From the central groundwater mound the groundwater also flows to the south toward Greenfield Creek and to the southeast toward the drainage ditch. The hydraulic gradient back toward the site to the west between MW-38 and MW-28A in Optimist Park is flattened. The vertical hydraulic gradient remains consistent, except that MW-19/19A changes from a downward gradient in the central portion of the site to an upward gradient.

5.6.3 Deep Aquifer

The low tide deep aquifer map (2/20/01 @ 13:00) indicates a groundwater flow direction to the southwest toward the Cape Fear River (Figure 9). Vertical hydraulic gradients are upward from the deep aquifer to the intermediate aquifer in the vicinity of the landfarm. A strong upward vertical gradient and an artesian condition exists in Optimist Park. The vertical gradient is neutral

along the western half of the site adjacent to Greenfield Creek. Boring logs in the vicinity of Greenfield Creek have indicated the absence of the confining clay layer between the deep and intermediate aquifer. This missing confining layer may explain the neutral gradient between the deep and intermediate aquifers in this portion of the site.

Please refer to Figures 10 through 12 for a pictorial illustration of groundwater elevation changes in the deep aquifer across a full tidal cycle. In the following paragraphs only changes in the groundwater flow in the deep aquifer relative to the low tide flow pattern are discussed. If a flow characteristic is not discussed then it can be assumed that no significant change as occurred.

During the rising tide between low and high tide (2/20/01 @ 16:00) the surface water elevation increases 2.99 feet in the Cape Fear River (Figure 10). Surface water flow in the Cape Fear River is to the north. The horizontal hydraulic gradient in the deep aquifer increases to the southwest toward the Cape Fear River. The vertical hydraulic gradient changes from neutral to downward in the southwestern portion of the site at MW-32/33. This change in gradient may be explained by the interconnection of the river and the intermediate aquifer. This connection and close proximity of this well cluster to the river allows for rapid water levels changes in the intermediate aquifer relative to the deep aquifer.

During high tide (2/20/01 @ 7:00) the surface water elevation increases 4.22 feet from low tide adjacent to the Cape Fear River (Figure 11). Surface water flow in the Cape Fear River is stagnant. The horizontal hydraulic gradient in the deep aquifer decreases to the southwest toward the Cape Fear River. The vertical hydraulic gradient changes from downward to upward in the southwestern portion of the site at MW-32/33. This change in gradient may be explained by the interconnection of the river and the intermediate aquifer. A delayed increase in the hydraulic head due to an increase in surface water elevation in the river is observed in the deep aquifer. A slight upward gradient is also present at well cluster MW-35/36 adjacent to Greenfield Creek.

During the falling tide between high and low tide (2/20/01 @ 10:00) the surface water elevation decreased 1.32 feet from high tide in the Cape Fear River (Figure 12). Surface water flow in the Cape Fear River is to the south. The horizontal hydraulic gradient in the deep aquifer remains consistent to the southwest toward the Cape Fear River. The vertical hydraulic gradient increases upward in the southwestern portion of the site at MW-32/33. The slight upward gradient at well cluster MW-35/36 adjacent to Greenfield Creek remains consistent.

5.9 Greenfield Creek Tidal Gate

The tidal gate will not necessarily prevent sediment transport from Greenfield Creek to the Cape Fear River, especially during creek high discharge events at low river tide. Nor will the gate exclude all swimming organisms in the Cape Fear River from entering Greenfield Creek. Immature fish characteristically use tributaries to avoid predation and food competition in larger water bodies.

Mature game fish were observed in Greenfield Creek, both during the 1997 Expanded Site Inspection and during an off-site reconnaissance by NCDENR on April 20, 1999. Mature fish

observed during the SRI included Bowfin, Largemouth Bass, Sunfish, Stripped Mullet and Gizzard Shad.

6.0 INVENTORY AND MAP OF ALL WELLS, SPRINGS, AND SURFACE WATER INTAKES USED AS POTABLE WATER SOURCES

6.2 Surface Water Supply Sources

The emergency surface-water intakes on Smith Creek and Toomers Creek have been unused for several decades due to salt-water encroachment.

7.0 IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS

Appropriate contacts were made to provide documentation of the absence of sensitive environments not previously identified on or adjacent to the site during the RI.

Mr. Harry E. LeGrand, Jr., a zoologist for the Natural Heritage Program of the Division of Parks and Recreation of NCDENR (Ref. 5) was contacted concerning sensitive environments in the vicinity of the site. Mr. LeGrande noted that no rare species, significant natural communities, or priority natural areas exist at the site. In verbal communication on March 20, 2001 Mr. LeGrand confirmed the absence of State Parks, Areas Important to Maintenance of Unique Natural Communities, Sensitive Areas Identified Under the Natural Estuary Program, Designated State Natural Areas, State Seashore, Lakeshore and River Recreational Areas, and Sensitive Aquatic Habitat.

Mr. LeGrand noted that the following sensitive environments are present at Greenfield Lake just east of the site:

Plants:

Carolina grasswort (*Lilaeopsis carolinensis*) – State Threatened

Animals:

Magnificent rams-horn (*Planorbella magnifica*) – State Endangered and Federal Species of Concern

Greenfield rams-horn (*Helisoma eucosmium*) – State Significantly Rare and Federal Species of Concern

Barrel floater (*Anodonta couperiana*) – State Endangered

American alligator (*Alligator mississippiensis*) – State Threatened and Federal Threatened Due to Similarity of Appearance

Fishes:

Least killifish (*Heterandria formosa*) – State Special Concern

The three mollusks (Magnificent rams-horn, Greenfield rams-horn and Barrel floater) have not been found in recent decades and are apparently extirpated.

Several rare species are present in the Cape Fear River, just to the west of the site. In addition to the American alligator, also present are:

Animals:

Manatee (*Trichechus manatus*) – State and Federal Endangered

Fishes:

Shortnose sturgeon (*Acipenser brevirostrum*) – State and Federal Endangered

Mr. Kim Huband of North Carolina Planning and Natural Resources on March 19, 2001 confirmed verbally the absence of State Wild and Scenic Rivers on or near the site.

Ms. Kay Karner of the Public Affairs Office of the National Park Service and Mr. Cecil McKeithan of the National Register of Historic Places on March 19, 2001 confirmed verbally the absence of National Seashore, Lakeshore and River Recreational Areas on or near the site. Wally Brittain of the same office confirmed the absence of Federal Designated Wild and Scenic Rivers on or adjacent to the site.

Ms. Mary Noel and Mr. Dave Wright of the United States Forest Service March 21, 2001 confirmed verbally on the absence of Designated and Proposed Federal Wilderness and Natural Areas on or adjacent to the site. Mr. Larry Haden of the same office confirmed the absence of National Preserves and Forests on or adjacent to the site. Mr. Steve Simone of the same office confirmed the absence of Federal land designated for the protection of Natural Ecosystems on or adjacent to the site.

Mr. Jay Sauber of North Carolina Division of Water Quality on March 20, 2001 confirmed verbally the absence of Critical Areas Identified Under the Clean Lakes Program on or adjacent to the site. Hope Thompson of the same office confirmed verbally on March 20, 2001 the absence of State Designated Areas for Protection or Maintenance of Aquatic Life on or adjacent to the site.

Mr. Joe Hogue of North Carolina Division of Forest Resources on March 21, 2001 confirmed verbally the absence of State Preserves and Forests on or adjacent to the site.

Mr. Dale Suiter of the United States Fish and Wildlife Service on March 21, 2001 confirmed verbally the absence of Terrestrial Areas Utilized for Breeding by Large or Dense Aggregations of Animals on or adjacent to the site (Ref. 6).

Mr. Frank McBride of the North Carolina Wildlife Resources Commission on March 21, 2001 confirmed verbally the absence of National or State Wildlife Refuges on or adjacent to the site.

Mr. Matt Stout of the National Oceanic and Atmospheric Administration (NOAA) on March 21, 2001 confirmed verbally the absence of Marine Sanctuaries on or adjacent to the site.

Ms. Renee Gledhill-Early of the North Carolina Department of Cultural Resources on March 21, 2001 confirmed verbally the absence of National and State Historical Sites on or adjacent to the site (Ref. 7).

Mr. Steve Benton of the North Carolina Division of Coastal Management on March 21, 2001 confirmed verbally the absence of Areas Identified Under Coastal Protection Legislation and Coastal Barriers or Units of a Coastal Barrier Resources System on or adjacent to the site.

Mr. Christian Waters of the North Carolina Wildlife Resources Commission on March 21, 2001 confirmed verbally the absence of Spawning Areas Critical for the Maintenance of Fish Species within River, Lake or Coastal Tidal Waters, Feeding Areas Critical for Maintenance of Anadromous Fish Species within River Reaches or Areas in Lakes or Coastal Tidal Waters in which such Fish Spend Extended Periods of Time and State Lands Designated for Wildlife or Game Management on or adjacent to the site. Mr. Waters did confirm that the Cape Fear River is designated a primary nursery area for fish, shrimp and crabs. The Cape Fear River is also a Migratory Pathway for the Shortnose Sturgeon, Stripped Bass, American Shad, Hickory Shad, Blueback Herring and the Alewife Herring.

8.0 CURRENT OWNER'S DEED TO THE PROPERTY

No deficiencies were noted in the RIR.

9.0 OWNERSHIP CHRONOLOGY

No deficiencies were noted in the RIR.

10.0 OPERATIONAL HISTORY, AERIAL PHOTOGRAPHS, AND SANBORN MAPS

Greenfield Creek was channelized sometime between 1938 and 1949, suggesting that contaminant migration to the ditch and creek sediments occurred subsequent to channelization. Prior to channelization the drainage ditch and Greenfield Creek meandered across a shallow floodplain

11.0 HAZARDOUS SUBSTANCE LIST

No deficiencies were noted in the RIR.

12.0 SITE ENVIRONMENTAL PERMIT AND REGULATORY HISTORY

12.1 Permits

The location of the new ditch in relation to the covered ditch is shown on Figure 13. The former ditch is located immediately to the north of the new (present) ditch.

13.0 SUMMARY OF ALL PREVIOUS AND ONGOING ENVIRONMENTAL INVESTIGATIONS AND REGULATORY INVOLVEMENT

All tables have been updated to list remediation goals for each dioxin and furan congener.

A semi-volatile source exists 0.7 miles upstream from the site in the Cape Fear River at the former Wilmington Coal Gas Plant Site, NCD 986 188 910. Sediment sample SS-14 collected from the Cape Fear River at the boat landing beneath Highway 74 confirmed the presence of semi-volatile constituents at this location. Cape Fear River sediment sample SS-14 will not be used as background because of potential impact from the former Wilmington Coal Gasification Plant. The range of values in sediment samples SS-16, SS-20, SS-22, and SS-24 may be used to demonstrate background concentrations in the Cape Fear River.

A semi-volatile source exists approximately 600 feet upstream of the tidal gate along Greenfield Creek at the former Chevron Asphalt Terminal property operated by VOPAK. The June 2001 Groundwater Monitoring Report for this facility indicates the historical presence of semi-volatile constituents in MW-6, MW-7, MW-9, MW-10, MW-11, MW-12 and MW-13 (Ref. 3).

Degradation of total wood-preserving constituents (semi-volatiles) in the landfarm between 1991 and 1996 is evident by comparing composite soil samples collected from 3-inches below the landfarm surface (designated U in 1991 and A in 1996) and 6-inches above the base of landfarm (designated L in 1991 and B in 1996) in both Landfarm 1 (LF1) and Landfarm 2 (LF2). In each landfarm area five locations were sampled (A, B, C, D and E) at each depth and composited to form a single sample (LF1U, LF2U; LF1A, LF2A; LF1L, LF2L; LF1B, LF2B) from each depth (Figure 14). For comparison each wood-preserving constituent detected was added together to arrive at the total wood-preserving constituents for each landfarm area. Total wood-preserving constituents in LF1 in 1991 (LF1U + LF1L) was 497.85 mg/kg dw. In 1996 (LF1A + LF1B) was 107.4 mg/kg dw. A 78 percent reduction in concentration of total wood-preserving constituents occurred in LF1 between 1991 and 1996. Total wood-preserving constituents in LF2 in 1991 (LF2U + LF2L) was 1,354.7 mg/kg dw. In 1996 (LF2A + LF2B) was 131.5 mg/kg dw. A 90 percent reduction of total wood-preserving constituents occurred in LF2 between 1991 and 1996. Please refer to Table 2 for the presentation of the data referencing specific samples and specific constituents that demonstrate the degradation of wood-preserving constituents in the landfarm.

Copper has been detected in the surface water, but at concentrations less than the Class SC/Class C WS-IV water quality standard.

14.0 PROCEDURES FOR CHARACTERIZING CONTAMINATION SOURCES

The procedures for completing the SRI are detailed in the SRIW submitted on May 23, 2000 to NCDENR (Ref. 1). On September 20, 2000 NCDENR approved the SRIW and provided authorization to proceed with the SRI field activities (Ref. 2).

All data collection and analysis and well installation activities completed during the implementation of the SRIW were conducted in accordance with the USEPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) dated May 1996 (including 1997 updates).

14.1 DNAPL Characterization

The areas of DNAPL accumulation were evaluated by collecting direct push cores (GeoProbe™) to the top of the peat and by installing monitoring wells in both the shallow and intermediate sandy aquifers at the site. DNAPL recovery tests were performed in all wells with pumpable DNAPL to determine the physical condition and mobility of the product (Table 3).

14.2 Groundwater Sampling

Groundwater measurement and sampling for previously identified constituents of concern (CoC) occurred at all monitoring wells associated with investigation activities at the site. Both Amerada Hess and VOPAK environmental representatives were contacted for authorization to access their monitoring wells for groundwater measurements. The water level in these wells and the on-site wells were measured across a full tidal cycle. Staff gauges were installed along the drainage ditch, Greenfield Creek and the Cape Fear River at locations shown on Figure 1. The groundwater and surface water measurements were collected to produce potentiometric maps illustrating the direction of groundwater flow on both sides of the drainage ditch and Greenfield Creek and to evaluate the effect of the new tidal gate on groundwater flow. Groundwater sampling was completed to provide current groundwater impact delineation maps for the site. The groundwater samples for dioxin/furan analysis were collected using low-flow (minimal drawdown) technology to minimize collecting suspended particles in the samples.

14.3 Subsurface Soil Sampling

Five subsurface soil samples were collected at locations where surface soils indicated dioxin/furan results that exceeded preliminary remediation goals determined during the RI at the site (Figure 19).

14.4 Sediment Sampling

All previously collected sediment samples in the Cape Fear River, Greenfield Creek and the drainage ditch were analyzed for dioxins/furans. Fifteen (15) additional sediment samples were collected and analyzed for CoCs to further delineate impact in the drainage ditch and Greenfield Creek. One additional sediment sample was collected from the Cape Fear River to evaluate

background concentrations for CoCs. Three sediment samples were collected in on-site wetlands and one sediment sample was collected in an off-site wetland area for background comparison. Bulk composite sediment samples were collected from the drainage ditch and Greenfield Creek for sediment toxicity assessment. All sediment samples collected during the SRI were also analyzed for grain size, percent organics and salinity (Attachment D-5). Field measurements included pH and oxidation/reduction potential (ORP). All field measurements are recorded on the field logs located in Attachment C-2.

14.5 Fish Tissue Sampling

Fish tissue samples were collected from Greenfield Creek, the drainage ditch, Greenfield Lake, and Burnt Mill Creek to evaluate the need for potential fish consumption advisories (Figures 31 and 32). Small fish composites were also collected to evaluate ecological concerns.

14.6 Human Health and Ecological Risk Assessment

A Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) were completed for the site and surrounding surface water bodies (Ref. 8 and 9). Potential carcinogenic and non-carcinogenic risks associated with consumption of fish from the Greenfield Creek drainage system were calculated for a typical adolescent trespasser angling on a quasi-urban creek system. Site risk for future utility, construction, and future site workers were also evaluated. Adverse effects on benthic macroinvertebrates as a potential prey base to higher trophic levels resulting from exposure to PAHs in sediments were evaluated in the ERA. Adverse effects on invertivorous bird populations resulting from exposures to chemicals in sediments and/or prey were also evaluated.

15.0 METHODS, LOCATIONS, DEPTHS, AND JUSTIFICATION FOR ALL SAMPLE COLLECTION POINTS FOR ALL MEDIA SAMPLED

Sample identification, date sampled, media sampled, location, depth, justification, consultant, parameters, and analytical methods for all sample collection points to date are listed in Attachment F-1 and for only samples collected during this SRI are listed in Table 4.

15.1 DNAPL Characterization Methodology

The extent and nature of dense non-aqueous phase liquid (DNAPL) had not been adequately investigated in the vicinity of the large storage tank area, the production area and the covered ditch. These areas of potential DNAPL accumulation were evaluated by collecting direct push (GeoProbe™) continuous cores to the top of the peat and by installing monitoring wells in both the shallow and intermediate sandy aquifers at the site.

15.1.1 Direct Push Coring

Direct push cores (76) were completed on approximately 100-foot centers in the central portion of the site (Figure 25). The direct push cores (4-foot long core intervals) were obtained using a GeoProbe™ rig. The cores were described for the presence/absence of DNAPL, the predicted

pumpability of the DNAPL and the depth to the top of the peat. The ground surface elevation and horizontal position of each direct push borehole was surveyed. The elevation of the top of the peat was plotted on a plan map (Figure 25) to evaluate the direction of potential DNAPL migration and pooling. Please refer to Attachment A for the direct push boring logs (core descriptions) noting all field observations and measurements.

GeoProbe™ coreholes GP-72, GP-73 and GP-74 were completed through the peat into the intermediate aquifer. Prior to completing these coreholes 4-inch diameter PVC surface casings were installed through the shallow aquifer and into the peat. The surface casings were installed using the hollow-stem auger method and grouted in place using the grout shoe method. No sooner than 24-hours later the corehole was advanced through the bottom of the surface casing and into the lower portion of the peat and the intermediate sand to the top of the lower clay.

15.1.2 DNAPL Recovery Testing

DNAPL recovery tests were completed on all monitoring wells that contained potentially pumpable product (MW-11B, MW-14, MW-26, MW-26A, MW-44, MW-44A and MW-45). The recovery test was completed by pumping the DNAPL from the well using a peristaltic pump. The intake tubing from the peristaltic pump was placed at the bottom of the well and the DNAPL pumped until groundwater was observed discharging from the pump indicating that the DNAPL had been removed from the well. The DNAPL thickness was then measured at set time intervals until the product thickness approached static conditions. All recovered DNAPL was containerized and disposed of properly. Please refer to Table 3 for the DNAPL recovery test results.

15.2 Well Installation

15.2.1 Shallow Aquifer

Shallow aquifer monitoring wells MW-43, MW-44, MW-45 and ORW-1 were installed in the large storage tank, covered ditch, and production areas (Figure 21). Each well was screened into the top of the peat to evaluate accumulation/pumpability of DNAPL.

At each monitoring well location a GeoProbe™ continuous corehole was completed to the top of the peat. The cores were described and logged according to the Unified Soil Classification Scheme. Decontamination procedures were completed between each borehole and all soil cuttings were contained and disposed of properly. Please refer to Attachment B for the shallow aquifer monitoring well boring and construction logs.

The upper aquifer monitoring wells were installed using the hollow-stem auger method. The monitoring wells were constructed with 10-foot long stainless steel screens. The well screens were positioned to bracket the top of the peat. The borehole diameter was sufficient to allow a minimum 2-inch annular space between the well casing and the borehole wall. The appropriate filter pack was placed from the bottom of the well screen to two feet above the top of the screen. At MW-44 the filter pack extended one foot above the top of the screen to allow for a bentonite seal between the sand and the land surface. A bentonite pellet seal with a two-foot thickness was

placed on top of the filter pack material by pouring. The bentonite seal was tamped in place and allowed to hydrate. The annular space above the bentonite seal was filled to within 2 feet of the land surface with a cement/bentonite grout by the tremie pipe method. The grout material was allowed to cure 24 hours before proceeding with additional well construction activities on the newly grouted well.

At each well a riser pipe extending a minimum of two feet above ground surface was protected by a keyed-alike locking anodized aluminum protective casing set in a continuous pour 3' x 3' x 6" concrete surface pad. The annular space between the riser pipe and the protective cover was filled with grout to a height 5-inches below the top of the riser pipe. A permanent reference point was placed on the top of the riser pipe, a survey nail was placed in the concrete pad, and a vent was drilled on the well and protective casing. The wells were permanently marked with the well number, date installed, site name, elevation, etc. Specifications for the above ground riser pipe, outer protective casing, and concrete surface pad are as shown on Figure 15. Well tags were riveted to the protective casing.

In order to remove the residual materials remaining in the wells after installation and to restore the natural hydraulic connection with the aquifer materials, the monitoring wells were developed. The wells were developed until the water from the well was visibly free of sediment. Well development was completed by gently pumping the well to remove the fine material. The development water was containerized and disposed of properly.

Following completion of monitoring well installation activities, the horizontal location (0.1 foot) and vertical elevation (0.01 foot) of the ground surface, surface pad and top of well casing (TOC) and the direct push locations were determined by direct field survey.

15.2.2 Intermediate Aquifer

Intermediate aquifer monitoring wells MW-26A and MW-44A were installed in the covered ditch area. Each well was screened into the top of the lower clay to evaluate accumulation/pumpability of product at this location. Intermediate aquifer monitoring well MW-11B was previously installed in the production area. GeoProbe™ corehole GP-72 was completed to the base of the intermediate aquifer in the large storage tank area. No DNAPL was observed in the intermediate aquifer beneath the large storage tank area and no monitoring well was installed.

The intermediate aquifer monitoring wells are double cased. The outer 6-inch diameter PVC surface casing was installed through the shallow aquifer and into the peat. The borehole was of adequate diameter to provide a 2-inch annular space between the borehole wall and the surface casing. A cement/bentonite grout was placed using the grout shoe method from the base of the outer casing to within two feet of the land surface. The grout was allowed to cure a minimum of 24 hours before proceeding with monitoring well installation at this location.

The intermediate aquifer borehole was continued using the mud rotary method to the top of the lower clay. The monitoring well was constructed with a five-foot long stainless steel screen. A filter pack was placed using the tremie pipe method from the bottom of the screen to two feet

above the top of the screen. A bentonite pellet seal with a minimum two-foot vertical thickness was placed by the tremie pipe method on top of the filter pack material. The bentonite seal was tamped in place and allowed to hydrate. The annular space above the bentonite seal was filled to within two feet of the land surface with a cement/bentonite grout by the tremie pipe method. The grout material was allowed to cure 24 hours before proceeding with additional well construction activities on the newly grouted well. The well was completed at the surface as described for the shallow aquifer monitoring wells.

15.3 Groundwater Sampling Methodology

All groundwater-sampling activities were completed in accordance with EISOPQAM.

15.3.1 Purging

Purging is the process of removing stagnant water from the well, immediately prior to sampling, causing its replacement by ground water from the adjacent formation, which is representative of actual aquifer conditions. In order to determine when a well had been adequately purged, the field investigators: 1) monitored the pH, specific conductance, temperature, and turbidity of the ground water removed during purging; and 2) observed and recorded the volume of water removed (Attachment C-2).

Prior to initiating the purge, the amount of water inside the well riser and screen was determined by measuring the depth to groundwater and the total depth of the well using a decontaminated water level meter. This length was multiplied by a factor that corresponds to the appropriate well diameter (0.163 for a 2-inch well), providing the amount of water, in gallons, contained in the well.

With respect to volume, an adequate purge is normally achieved when three to five times the volume of standing water in the well has been removed. The field notes (Attachment C-2) reflect the single well volume and the total amount of water purged from the well.

With respect to the ground water chemistry, an adequate purge is achieved when the pH, specific conductance, and temperature of the ground water stabilizes and the turbidity either stabilizes or is below 10 Nephelometric Turbidity Units (NTUs). Stabilization occurs when pH measurements remain constant within 0.1 Standard Unit (SU), specific conductance varies no more than 10 percent and the temperature is constant. If the parameters had not stabilized with removal of five well volumes, purging was discontinued.

In some situations, even with slow purge rates, a well pumped or bailed dry. This generally constituted an adequate purge and the well was sampled following sufficient recovery (enough volume to allow filling of all sample containers). Attempts were made to avoid purging a well to dryness.

The monitoring wells were purged using single use polyethylene bailers, a peristaltic pump, or a submersible pump, depending on well purge volume and access conditions. A peristaltic pump was the preferred purge device, except where a large volume of water needed (deep wells) to be pumped or access to the well head did not allow the use of the peristaltic pump (area not accessible

with a portable generator). When a peristaltic pump was used, only the intake line was placed into the water column. The line placed into the water was standard-cleaned Teflon™ tubing, for peristaltic pumps. When a submersible pump was used, the pump/hose assembly was lowered into the top of the standing water and not deep into the column. This was done so that the purging removed the entire static volume from the well. The pump was decontaminated between well locations. When a bailer was used it was lowered into the top of the water and not deep in column during purging. New tubing/bailers were used at each well. Used tubing and bailers were disposed of properly.

Low flow (minimal drawdown) purging was completed on monitoring wells MW-12, MW-14, MW-17, MW-34 and MW-40 for dioxin/furan analysis. The low flow purging is a procedure used to minimize turbidity in a well. The peristaltic pump intake hose was placed just beneath the water in the well. Flow rates did not exceed the recharge rate of the aquifer. The recharge rate was monitored by measuring the top of the water column for drawdown with a water level recorder while pumping. The pump rate was set so that no drawdown occurred in the well (i.e. recharge rate equaled pumped discharge rate). Water quality indicator parameters (pH, specific conductance, redox, dissolved oxygen, temperature and turbidity) were measured with a flow-through cell to determine purging needs prior to sample collection.

15.3.2 Sampling

Sampling is the process of obtaining, containerizing, and preserving the ground water sample after the purging process is complete.

New clean latex gloves were worn and changed between samples.

Samples for volatile organic compound analysis were collected first. They were collected by lowering new Teflon™ tubing into the well to the desired depth and placing a gloved thumb over the end of the tubing, capturing the water contained in the tubing. The tubing was then removed from the well and the sample collected by draining the water from the tubing into the sample vials.

A new disposable bailer was used to collect the remaining samples from each well. The bailer was gently immersed into the top of the water column until just filled. The bailer was gently removed from the well and the contents carefully emptied into the appropriate sample containers.

15.4 Soil Sampling Methodology

All soil-sampling activities were completed in accordance with EISOPQAM (Ref. 11).

15.4.1 Surface Soils

No surface soils were collected during this investigation. However, sediments in wetland areas that were not underwater were collected using surface soil procedures. Surface soils were collected using stainless steel spoons and glass pans. Prior to collecting the sample the land surface was prepared by removing overlying leaves, pine needles and grass. Care was taken to not remove the soil along with these materials.

Volatile organic compound samples (VOCs) were collected first and placed directly into the sample containers with no mixing and no headspace. VOCs were collected using a disposable EnCore™ sampler. The EnCore™ sample container was pushed directly into the soil, collecting the specified sample size (5 grams), and immediately capped. The sample was labeled and placed in the EnCore™ sampler bag and placed on ice for shipment to the analytical laboratory. A bulk VOC sample was also collected. The bulk sample was collected by spooning the soil directly into the sample container. The soil container was filled and capped with no headspace.

The remaining samples were collected by spooning the soil into a decontaminated glass pan and mixing the soil thoroughly to ensure that the sample is as representative as possible of the sample media. The samples were mixed by the quartering method. The material in the sample pan was divided into quarters and each quarter was mixed individually by turning the sample with the spoon. Two quarters were then mixed to form halves. The two halves were then mixed to form a homogenous matrix. This procedure was repeated several times until the sample was adequately mixed. The sample was then spooned into the appropriate sample containers for analysis.

15.4.2 Subsurface Soils

A decontaminated stainless steel hand auger was used to collect the subsurface samples. The four-inch diameter auger-buckets were pushed and twisted into the ground and removed as the buckets were filled. When the sampling interval was reached the auger bucket was removed and a new decontaminated auger bucket was placed on the end of the auger extension immediately prior to collecting the sample. The sample was removed from the borehole in the auger bucket. The top several inches of soil were removed from the bucket to minimize the chances of cross-contamination of the sample by fall-in of material from the upper portions of the hole. The sample for VOC analysis was collected directly from the auger bucket using the EnCore™ method as previously described for the surface soils. The remaining samples were placed in a decontaminated glass pan and thoroughly mixed (as previously described) prior to placing the sample in the appropriate sample containers.

15.5 Sediment Sampling Methodology

The preferred method for reaching the sediment sampling locations was by wading. However, when the water was too deep to wade, the sediment samples were collected from a boat. All sediment sampling activities proceeded in a downstream to upstream direction.

If the surface water body was wadeable, the sediment sample was collected using a decontaminated stainless steel spoon and glass pan. The sampling was accomplished by wading into the surface water body in an upstream direction. While facing into the current the sample was collected by scooping the sample spoon along the bottom of the surface water body in the upstream direction. Excess water was removed from the spoon while being careful to retain the fine particle size material. The sample was then placed in a glass pan.

In the surface water bodies that were too deep to wade, a stainless steel hand auger was used to retrieve the sample. The sediment was carefully removed from the hand auger bucket and placed into the glass pan.

The samples collected for volatile organic compounds were collected first and placed directly into the appropriate containers. In shallow water the VOC sample was collected directly into the EnCore™ sample container and the bulk VOC sample container as previously described for the surface soil samples. In deep water the sediment sample for VOC analysis was collected directly from the hand auger bucket. The outer sediment layer was scraped from the bucket prior to collecting the sample. The remainder of the sample was placed into the glass pan, mixed thoroughly, then distributed to the appropriate containers. The sediment samples were collected from a depth of surface to 3-inches.

Because the sulfide ion is unstable in the presence of oxygen, the sediment sample collection procedure for Acid Volatile Sulfide (AVS) analysis minimized the exposure to oxygen during sample collection. AVS samples were collected directly into the sample container while holding the container beneath the surface of the water. The container was filled with no headspace and capped prior to removing the sample container from beneath the surface of the water.

15.6 Fish Tissue Sampling Methodology

Fish tissue samples for chemical analyses necessary for risk assessment modeling were collected by use of a small electroshock boat. NCDENR personnel observed the fish tissue sampling activities. The electroshock boat was placed in the surface water body and proceeded to work the body until the appropriate amount of fish samples had been collected. Upon collection of the desired fish species, the specimens were rinsed with surface water from the collection point, identified, weighed, measured, catalogued, and visually inspected for any lesions or other physical abnormalities. After recording this information on field data sheets (Attachment C-4), the fish species were sorted and wrapped whole for analysis. In a few instances where only a few fish of a particular species were collected, the fish was filleted in the field to obtain the appropriate number of samples for analysis. Each sample consisted of multiple fish of the same species or a single fish, depending on fish size and the recommended weight for one sample. One sample was identified when the weight of the combined target species was achieved. The field sheets located in Attachment C-4 indicate the number of fish and size used to make a sample.

Small fish collected for ecological receptor analysis (avian) were collected by wading with a electroshock backpack. Small fish were collected until the weight required for sample analysis was obtained.

The fish samples were prepared for shipment to the analytical laboratory. The fish samples were double wrapped in aluminum foil, placed in a double waterproof freezer bag, labeled and placed immediately on ice. The fish samples were delivered to the laboratory overnight following laboratory protocols.

16.0 FIELD AND LABORATORY PROCEDURES FOR QA/QC

16.1 Field QA/QC

All sample collection, sample preservation, and chain-of-custody procedures used during this investigation were in accordance with the approved health and safety plan and the current U.S. Environmental Protection Agency (EPA) Region IV, Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), May 1996 (with 1997 amendments). In particular, the following sections of the EISOPQAM (Ref. 11) were followed during completion of the SRI:

- Section 3 Sample Control, Field Records, and Document Control
- Section 6 Design and Installation of Monitoring Wells
- Section 7 Groundwater Sampling
- Section 11 Sediment Sampling
- Section 12 Soil Sampling

All sample identification, chain-of-custody records, and field records were recorded with waterproof, non-erasable ink. If errors were made in any of these documents, corrections were made by crossing a single line through the error and entering the correct information. All corrections were initialed and dated.

Field analyses or measurement data were recorded on field logs. Samples collected for laboratory analysis were recorded on a chain-of-custody record and were identified using sample tags that were attached to the sample containers. The project name, project location, sample identification number, sampler's name, and date and time of sample collection were included on each sample tag. The project name, project location, sample identification number, date and time of sample collection, a brief description of the sampling location, the sampler's signature, and any relevant comments were included on the field log. The project name, project location, sample identification number, date and time of sample collection, designation of the sample as a grab or composite, type of sample, whether the sample is preserved or unpreserved, the total number of sample containers, and the types of analyses to be performed were included on the chain-of-custody. The date, time, signature of the sample custodian and subsequent transferee(s) are also included on the chain-of-custody record.

Individual samples were packed in coolers. Sufficient headspace was left in all bottles (except VOCs) to compensate for any pressure and temperature changes. All lids on all bottles were verified tight. Glass bottles were placed in separate and appropriately sized polyethylene bags and sealed with tape. The cooler was lined with a large heavy-duty plastic bag. Bubble-wrap was placed along the bottom and sides of the cooler. The bottles were placed in the cooler with sufficient space to allow for the additional bubble-wrap between the bottles. Ice was double bagged in heavy-duty polyethylene bags on top of and between the samples. Any remaining space was filled with bubble-wrap.

The original and one copy of the chain-of-custody record was placed in a plastic zip-lock bag inside the shipping container and the shipping container secured. One copy of the record was retained by the project leader. The shipping container was sealed with a custody seal. The sample custodian dated and signed the seal. The Air Bill shipping receipt was retained as part of the documentation.

A dedicated logbook was maintained for this project (Attachment C-1). The project leader's name, the sample team leader's name, the project name and location, and the project number were entered on the inside of the front cover of the logbook. Each page in the logbook was numbered and dated. At the end of all entries for each day the investigator drew a diagonal line and initialed indicating the conclusion of the entry.

Field quality assurance/quality control (QA/QC) included:

- One duplicate sample per medium per container type per field day.
- An equipment rinsate blank for each set of equipment that was decontaminated per sample set.
- A VOA trip blank for each sampling group.

All sample locations were staked or flagged until surveyed.

16.2 Laboratory QA/QC

The laboratory reports include at a minimum the items listed below:

A statement certifying that the laboratory is either certified for applicable parameters under 15A NCAC Subchapter 2H .0800, or that it is a contract laboratory under EPA's Contract Laboratory Program.

A signed statement that the samples were received in good condition and at the required temperature and that analysis of the samples complied with all procedures outlined in USEPA methodology, unless otherwise specified. Any deviations from the methods, additional sample preparation, sample dilution and analytical problems not rectified, are justified in a narrative with the laboratory report.

Laboratory sheets for all analytical results, including sample identification, sampling dates, date samples were received, extraction dates, analysis dates, analytical methods used, dilution factors and sample quantitation limits.

Laboratory sheets for all laboratory quality control samples, including results for bias and precision and control limits used. The following minimum laboratory quality control sample reporting was required: (a) at least one matrix spike and one matrix spike duplicate per sample delivery group or 14-day period, whichever is more frequent (control limits must be specified); (b) at least one method blank per sample delivery

group or 12-hour period, whichever is less; and (c) system monitoring compounds, surrogate recovery required by the method and laboratory control sample analysis (acceptance criteria must be specified). All samples that exceed control limits/acceptance criteria were flagged in the laboratory report.

Completed chain-of-custody was attached to the analytical report.

The laboratory report includes the names and qualifications of the individuals performing each analysis, the quality assurance officer reviewing the data, and the laboratory manager.

17.0 ANALYTICAL PARAMETERS AND ANALYTICAL METHODS FOR ALL SAMPLES

Analytical methods for all samples are listed on the Sample Database Summary Table (Table 4) and with the analytical results located in Attachment D.

The sampling investigation included the collection of groundwater, soil, sediment, and biological tissue samples. Samples were analyzed for previously detected extractable (SVOC) and purgeable organic compounds (VOC), chromium, copper, arsenic, and dioxins/furans. The samples were not analyzed for pesticides, PCBs, or cyanide. Fish tissue samples were analyzed for previously detected extractable organic compounds, dioxin/furans, and lipid content.

Soil and groundwater analytical methods included:

Purgeable (volatile) compounds	Method 8260
Extractable (semi-volatile) compounds	Method 8270C
Chromium, copper, and arsenic	Method 6010
Dioxins/Furans	Method 1613

Sediment analytical methods included:

Purgeable (volatile) compounds	Method 8260
Extractable (semi-volatile) compounds	Method 8270C
Chromium, copper, and arsenic	Method 6010
Dioxins/Furans	Method 1613
Ammonia	Method 350.1
Particle Size	ASTM D422
Salinity	ASTM D4542
Total Organic Carbon	Method 9060
AVS-SEM	Method 68-03-3534

Fish tissue analytical method included:

Extractable (semi-volatile) compounds	Method 8270C
Dioxins/Furans	Method 1613
Lipid Content	Method OB\1090

Sample container type, holding times and preservation used during the investigation is as follows:

<u>Analyses</u>	<u>Containers</u>	<u>Preservative</u>	<u>Holding Time (days)</u>
Purgeable Organics			
Soil/Sediment	EnCore™ 5 g	Ice (4°C)	14
Soil/Sediment (Bulk)	125 ml glass jar ¹	Ice (4°C)	14
Water	40 ml clear glass ¹	HCL/Ice (4°C)	14
Extractable Organics			
Soil/Sediment	250 ml glass jar ²	Ice (4°C)	54 ³
Water	1 liter amber ² glass	Ice (4°C)	47 ⁷
Fish Tissue	Aluminum foil	Ice (4°C)	2 ⁶
Metals			
AVS-SEM	250 ml plastic	Ice (4°C)	14
Soil/Sediment	250 ml plastic	Ice (4°C)	360 ⁴
Water	250-ml nalgene	50% HNO ₃ ⁸	180
Fish Tissue	Aluminum foil	Ice (4°C)	2 ⁶
Dioxins/Furans			
Soil/Sediment	4 oz. amber glass	Ice (4°C)	75 ⁵
Water	1 liter amber glass ²	Ice (4°C)	75 ⁵
Fish Tissue	Aluminum foil	Ice (4°C)	2 ⁶
Misc.			
Total Organic Carbon	250-ml glass	Ice (4°C)	
Ammonia	250 ml glass	Ice (4°C)	
Total Lipids	Aluminum foil	Ice (4°C)	2 ⁶
Particle Size	Polyethylene Bag		
Salinity	Polyethylene Bag		

¹ Amber glass with Teflon™ septum lid

² Teflon™ Lid

³ 54 days: 14 days to extraction, 40 days to analysis

⁴ 360 days: 180 days to extraction, 180 days to analysis

⁵ 75 days: 30 days to extraction, 45 days to analysis

⁶ If holding time will exceed 2 days then freeze sample

⁷ 47 days: 7 days to extraction, 40 days to analysis

⁸ pH < 2.0 s.u.

18.0 CONTACT NAME, ADDRESS, AND TELEPHONE NUMBER OF PRINCIPAL CONSULTANTS

Principal Consultant:

Schnabel Engineering Associates, Inc.
Contact - Gregory B. Kuntz, P.G., Project Manager
104 Corporate Blvd., Suite 420
West Columbia, SC 29169
Telephone: 803-796-6240
Fax: 803-796-6250

Schnabel Engineering Associates, Inc. is a North Carolina Corporation, a Registered Engineering and Geology Firm (F-0678) with the North Carolina State Board of Registration for Professional Engineers and Land Surveyors, and a Registered Environmental Consultant (#00041) under the North Carolina Inactive Hazardous Waste Site Program.

Gregory B. Kuntz is a North Carolina Registered Geologist (#1203) and a Registered Site Manager under the North Carolina Inactive Hazardous Waste Site Program. Rich Wargo is a North Carolina Registered Engineer (#23435) and the office manager.

Principal Laboratories:

Savannah Laboratories and Environmental Services, Inc.
Contact - James W. Andrews, Ph. D., Project Manager
5102 LaRoche Avenue
Savannah, GA 31404
Telephone: 912-354-7858
Fax: 912-352-0165

Savannah Laboratories and Environmental Services, Inc. in accordance with the provisions of N.C.G.S. 143-215.3 (a) (1), 143-215.3 (a) (10), and NCAC 2H.0800 is certified to perform environmental analysis and report monitoring data to the Division of Water Quality, North Carolina Department of Environment and Natural Resources.

Savannah Laboratories and Environmental Services, Inc. performed extractable and purgeable organics, metals and fish tissue analysis.

Paradigm Analytical Laboratories, Inc.
Contact - Matthew Burns
2627 Northchase Parkway S.E.
Wilmington, NC 28405
Telephone: 910-350-1903
Fax: 910-350-1557

Paradigm Analytical Laboratories, Inc. in accordance with the provisions of N.C.G.S. 143-215.3 (a) (1), 143-215.3 (a) (10), and NCAC 2H .0800 is certified to perform environmental analysis and report monitoring data to the Division of Water Quality, North Carolina Department of Environment and Natural Resources.

Paradigm Analytical Laboratories, Inc. performed high-resolution dioxin/furan analysis. Paradigm Analytical Laboratories, Inc.'s quality assurance manual is presented in Ref. 12.

AMEC Earth and Environmental performed the sediment toxicity testing, the human health risk assessment and the ecological risk assessment. The address and phone number is shown below:

AMEC Earth and Environmental
Bioassay Laboratory
5550 Morehouse Drive
Suite B
San Diego, CA 92121
Telephone: 858-458-9044
Fax: 858-458-0943

AMEC Earth and Environmental
15 Franklin Street
Portland, ME 04101
Telephone: 207-879-4222
Fax: 207-879-4223

The contact person for AMEC is Marilyn Schwartz in San Diego for the ecotoxicity testing and Mark Maritato in Portland for the human health and ecological risk assessments.

19.0 EQUIPMENT AND PERSONNEL DECONTAMINATION PROCEDURES

19.1 Equipment Decontamination Procedures

Decontamination procedures were implemented to avoid cross-contamination of samples. Sampling equipment were thoroughly cleaned and decontaminated before initial use and between sample locations.

A designated cleaning/decontamination station was established prior to beginning remedial assessment activities. This decontamination area was located downgradient and down wind from the clean equipment drying and storage area. The decontamination area consisted of a polyethylene lined waste pit to contain the rinse water and waste materials until they could be collected. At the completion of sampling activities all waste materials and polyethylene was removed from the decontamination pit and disposed in appropriate investigation derived waste (IDW) containers.

All cleaning of drill rods, auger flights, well screens, and casings occurred over plastic sheeting in the decontamination basin using appropriate means. All drilling rigs, drilling and sampling equipment, backhoes, and all other associated equipment involved in the drilling and sampling activities was cleaned and decontaminated before entering the designated activity areas. The drill rig and drill rods/augers were steamed cleaned prior to drilling each borehole.

All sampling equipment involved in the assessment activities was cleaned and decontaminated before entering designated activity areas, between samples and prior to leaving the site using the following procedure:

- 1) Wash equipment thoroughly with laboratory grade, phosphate-free detergent and potable water using a brush to remove any particulate matter or surface film.
- 2) Rinse thoroughly with potable water.
- 3) Rinse thoroughly with deionized water.
- 4) Rinse twice with pesticide-grade isopropanol.
- 5) Rinse with organic-free water and allow to air dry.
- 6) Wrap with aluminum foil to prevent contamination, if storing or transporting the equipment prior to use.

Deionized water, organic-free water, and isopropanol were applied using non-interfering containers made of glass, Teflon™, or stainless steel.

19.2 Personnel Decontamination Procedures

Pre-work and weekly health and safety tailgate meetings were conducted by the Health and Safety Officer assigned for each phase of the investigation. Personnel were instructed on the use of personnel protective equipment (PE). Level D protection was used in all investigations at the site. Personnel were instructed to wear rubber boots, Tyvek suits, and gloves appropriate for the tasks being completed. Instruction was given on how to provide protection against dermal, inhalation, and ingestion of potential contaminated materials. No smoking, eating, or drinking was allowed when a potential for exposure was present. At task completion, breaks, or at the end of each day, or between individual samples, as appropriate, the PE was removed and placed in appropriate investigation derived waste (IDW) containers. Decontamination consisted of a boot, hand, and face wash using detergent and potable water. A decontamination station including non-phosphate detergent, potable water, eye wash, fire extinguisher, first aid kit, emergency first aid guide book, and the task-specific health and safety plan was established adjacent to the decontamination area.

20.0 HEALTH AND SAFETY PLAN

A health and safety plan that conforms to OSHA 1910.120 requirements and assured that the health and safety of nearby residential and business communities were not adversely affected by site investigation activities was previously submitted in Attachment K of the June 24, 1999 Draft RI. Presented in Ref. 13 is the signed acknowledgement form indicating review and understanding by all participants in the field activities during the SRI.

21.0 SCHEDULE FOR SITE ACTIVITIES AND REPORTING

No scheduled activities are currently approved for this site.

22.0 OTHER INFORMATION REQUESTED BY NCDENR

22.1 Preliminary Remediation Goal Exceedance By Media

The summary table of constituents that exceed preliminary remediation goals (PRGs) has been updated to include site-specific PRGs for industrial site use and the absence of sample analytical data for any medium. Constituents that exceed PRGs for each media at the site are summarized below:

<u>CONSTITUENTS</u>	<u>SOIL</u>	<u>GW</u>	<u>SEDIMENT</u>	<u>SW</u>	<u>FISH</u>
<u>Semi-Volatiles</u>					
2,4-Dimethylphenol	-	X	-	-	-
2-Chlorophenol	-	X	-	-	-
2-Methylnaphthalene	-	X	X	-	-
2-Methylphenol (o-Cresol)	-	X	-	-	-
3-and/or 4-Methylphenol (m&p-Cresol)	-	X	-	-	-
Acenaphthene	-	X	-	-	-
Benzo(a)anthracene	X	X	X	-	-
Benzo(a)pyrene	X	X	X	-	-
Benzo(b)fluoranthene	X	X	X	-	-
Benzo(k)fluoranthene	X	X	-	-	-
Bis(2-ethylhexyl)Phthalate	-	X	-	-	-
Carbazole	-	X	-	-	-
Chrysene	-	X	X	-	-
Dibenzo(a,h)anthracene	X	X	-	-	-
Dibenzofuran	X	X	-	-	-
Fluoranthene	X	X	-	-	-
Fluorene	X	X	-	-	-
Indeno(1,2,3-cd)pyrene	-	X	X	-	-
Naphthalene	-	X	X	-	-
Pentachlorophenol	X	X	-	-	-
Phenanthrene	X	X	-	-	-
Phenol	-	X	-	-	-
Pyrene	-	X	-	-	-
<u>Volatiles</u>					
1,1,2,2-Tetrachloroethane	-	X	-	-	NA
Acetone	-	X	-	-	NA
Benzene	-	X	-	-	NA
Bromodichloromethane	-	X	-	-	NA
Chloroform	-	X	-	-	NA
Dichloromethane (Methylene Chloride)	-	X	-	-	NA
Ethylbenzene	-	X	-	-	NA

Inorganics

Aluminum	-	-	X	-	NA
Arsenic	X	X	X	-	-
Chromium	-	X	-	-	-
Copper	-	-	-	X	-
Iron	X	X	X	X	NA
Lead	X	X	X	-	NA
Magnesium	X	-	-	-	NA
Manganese	-	X	-	-	NA
Potassium	X	-	-	-	NA

Pesticides/PCBs

PCB-1260 (Aroclor 1260)	-	-	-	X	NA
Alpha-Chlordane/2	-	-	-	X	NA

Dioxins and Furans

123678-HxCDD	-	X	-	NA	-
123789-HxCDD	-	X	-	NA	-
1234678-HpCDD	X	X	-	NA	-
OCDD	X	X	-	NA	-
23478-PeCDF	-	X	-	NA	-
123478-HxCDF	-	X	-	NA	-
123789-HxCDF	-	X	-	NA	-
1234678-HpCDF	X	X	-	NA	-
OCDF	-	X	-	NA	-
2378-TCDD TEQ	X	-	X	NA	-

Notes:

- X Constituents detected at a concentration that exceeds the PRG.
- Constituent analyzed but did not exceed the PRG.
- NA Constituent not analyzed.
- GW Groundwater
- SW Surface water

Surface Water

PCB and Alpha-Chlorodane/2 detected in upgradient surface water samples in Greenfield Creek at a concentration that exceeds the PRG. These contaminants are not wood-treatment-related constituents. Copper was detected at a background concentration that exceeds the PRG in all surface water samples from the Cape Fear River, drainage ditch and Greenfield Creek. The cyanide and iron PRG exceedances are not attributable to the site.

Groundwater

Acetone and dichloromethane (methylene chloride) in the groundwater are considered laboratory contaminants and not site-related constituents. Filtered samples indicated no PRG exceedance for dioxin/furans in the groundwater. Bromodichloromethane (deep aquifer) and chloroform (intermediate and deep aquifers) were only detected in the intermediate and deep aquifers adjacent to Greenfield Creek. These constituents are not site-related and may be laboratory artifacts.

Sediments

Aluminum, iron, and lead in sediment are not site constituents. They are considered naturally occurring background concentrations, not PRG exceedances. Sediment samples did not exceed the PRG for individual dioxin/furan congeners, however, the PRG for the 2378-TCDD TEQ was exceeded.

Soil

Dibenzofuran, fluoranthene, fluorene, and phenanthrene exceeded the PRG at only one subsurface soil location (SB-08). Pentachlorophenol exceeded the PRG only once in Landfarm 2 (1991) subsurface soil. Calcium, iron, magnesium, potassium, and cyanide are not site-related constituents. Lead exceeded the PRG only in surface soil sampled from the onsite roadbeds (1993). Soil data was evaluated for all samples collected after 1985. All areas sampled prior to 1985 were disposed in a secure landfill, excavated and placed on the landfarm, tilled in place, or excavated, stabilized with cement and placed back in the excavation. Soil samples collected before 1990 from the landfarm areas are considered landfarm operation samples and were not evaluated for PRG exceedance.

22.2 Land Use Restrictions

Please refer to Ref. 14 for the Voluntary Consent for Land Use Restrictions form signed and notarized by the North Carolina State Ports Authority.

22.3 Surface Water Detections

Arsenic has been detected (9J ug/l) in one surface water sample in the drainage ditch at a concentration less than the surface water standard of 50 ug/l. Chromium was detected in the upgradient Greenfield Creek surface water sample at a concentration (3 ug/l) less than the surface water standard (20 ug/l). Copper was detected (15J to 23J ug/l) in all surface water samples collected by Black and Veatch during the Expanded Site Inspection (ESI; Ref. 15) at concentrations that exceed the surface water standard (3 ug/l). Copper was present at 20J ug/l at the background location.

23.0 CERTIFICATION

Please refer to the page following the title page for certification of this report.

24.0 NARRATIVE ON HOW INVESTIGATIONS WERE CONDUCTED AND VARIANCES FROM THE APPROVED WORKPLAN

24.1 How Investigations Were Conducted

The SRI investigation was conducted by first preparing a workplan for site activities that was approved by NCDENR on September 20, 2000. Field work for the SRI began on October 23, 2000. Sampling locations and sample collection methodologies are presented in Sections 14 through 17 of this report.

The workplan recommended two phases of sediment sampling with Phase 1 results determining the sampling requirements to be completed during Phase 2. If dioxins/furans were detected above background in selected sediment samples during Phase 1, then dioxins/furans would be analyzed from all previously collected sediment samples locations and all proposed sediment and fish sample locations. Dioxins/furans were detected during Phase 1 sampling activities. Phase 1 sediment sampling was completed between October 23 and 24, 2000.

While the Phase 1 sediment samples were being analyzed site activities proceeded to the characterization of the extent of Dense Non-Aqueous Phase Liquids (DNAPLs) in the shallow aquifer and the topographic expression of the top of the peat that underlies the shallow aquifer. The DNAPL extent determination occurred between November 1 and 22, 2000. DNAPL extent determination included continuously coring the soil in the shallow aquifer to the top of the underlying peat, installing six groundwater monitoring wells and conducting DNAPL recovery tests from all wells containing pumpable free product.

Phase 2 sediment sampling activities occurred between January 8 and 26, 2001. Sediment samples were collected from the Cape Fear River, Greenfield Creek, the on-site drainage ditch, on-site wetlands, and off-site wetlands.

On-site subsurface soil samples were collected for dioxin/furan analysis on January 25, 2001.

All monitoring wells were sampled between February 12 and 14, 2001. Groundwater levels were measured during a full tidal cycle on February 20, 2001.

All sampling locations were surveyed on March 22 through 24, 2001.

Fish tissue sampling occurred between April 23 and 25, 2001.

24.2 Workplan Variances

Variances from the workplan included the additional investigation of former pipelines at the facility and an increase in the number of GeoProbe™ coreholes necessary to define the extent of DNAPL in the shallow aquifer at the site. The location of the former pipelines from the T-Head in the Cape Fear River to the bulk storage tank area and from the bulk storage tank area to the working tank area were investigated for potential releases to the subsurface. It was determined

that the main line from the T-Head to the bulk storage tank area was still in place. All other pipelines had been removed during site demolition activities. The T-Head pipeline location was observed to be free of impact except at its connection to the bulk storage tank area. This extent of impact was defined during the GeoProbe™ investigation. The location of the other pipelines and any impact to the subsurface in these areas were also investigated during the GeoProbe™ investigation. The SIRW recommended the completion of 36 coreholes to define the DNAPL extent in the shallow aquifer. A total of 76 coreholes were completed to define the DNAPL extent.

The SRI workplan recommended the installation of two shallow aquifer and one intermediate aquifer monitoring wells to define the extent of DNAPL. Based on the GeoProbe™ investigation four shallow aquifer and two intermediate aquifer monitoring wells were installed. This change was approved in advance by NCDENR.

Dioxin/Furan analysis was proposed to be completed by USEPA Method 8290 in the SRIW. In a letter dated October 20, 2000 Schnabel recommended to NCDENR the use of USEPA Method 1613 for dioxin/furan analysis (Ref. 17). On October 23, 2000 NCDENR approved the use of USEPA method 1613 for all dioxin/furan analyses completed during the SRI (Ref. 17). The SRIW also indicated that Triangle Laboratories would be used for the dioxin/furan analyses. Also included in the request to NCDENR was the recommendation to use Paradigm Analytical Laboratories.

Background subsurface soil (SS-2DF) and wetland location (SD-39) were not collected at the locations indicated in the SRIW. Background subsurface soil sample SS-2DF was proposed to be collected in the same location as the Black & Veatch background subsurface soil sample SB-02 located near the northeast corner of the site across the railroad tracks. During Schnabel's attempt to collect the sample it was discovered that the groundwater surface was less than 1 foot below land surface. Upon approval from NCDENR the background subsurface soil sample was collected from Optimist Park (Figure 18). The background wetland sample was proposed to be collected in the wetland area northeast of the site near the Black & Veatch background sample but was moved to the NCSPA property located south of the site due to the presence of wind-blown paper trash. During collection of the background wetland sample on the NCSPA property a black tar-like substance was observed in the soil. Upon approval by NCDENR the background wetland sample was collected on the east side of Greenfield Lake at least a mile from the site (Figure 27).

Fish tissue sampling was postponed from the planned sampling date in February 2001 to a date at the end of April 2001 due to the increased likelihood of collecting fish samples in late spring. In the SRIW it was suggested that the fish tissue samples be collected using NCDENR DWQ equipment and personnel for oversight. It was later decided that a separate consultant needed to be used and that Stuart Parker of NCDENR would provide oversight.

The date of SRIR submittal was extended due to the delay in fish sampling and the extra time required entering the Black & Veatch ESI analytical data into our electronic database. This data could not be delivered to Schnabel electronically.

25.0 MONITORING WELL DESIGN

Monitoring well design, installation method, installation procedure, as-built well construction logs, well construction materials, and geologic logs are provided in Attachment B. No well installation permits were required to install monitoring wells at the site. All monitoring well installation procedures followed Section 6.0 of the 1996 USEPA Region IV EISOPQAM.

26.0 SITE MAP

Scaled site maps showing all soil (Figures 16, 17, 18 and 19), groundwater (Figures 21, 22, 23 and 24), sediment (Figures 27, 28 and 29), surface water (Figure 30) and fish tissue (Figures 31 and 32) sample locations are presented in this report. A North Carolina Registered Land Surveyor surveyed the site features to a known benchmark.

27.0 LABORATORY QUALITY CONTROL AND QUALITY ASSURANCE

Laboratory QA/QC is presented in Section 16 of this report. QA/QC data is presented on the laboratory analytical data sheets in Attachment D.

28.0 INVESTIGATION DERIVED WASTE MANAGEMENT

Investigation derived waste (IDW) materials were generated during the field activities. Potentially contaminated materials generated included soil, sediment, groundwater, decontamination solutions, DNAPL, personal protective equipment, and disposable equipment. Since some of these materials may be hazardous wastes, they were all handled, stored, treated, and disposed of properly.

Solid and liquid IDW was handled separately. Solids and sludge were placed in a roll-off container. Liquid IDW was placed in DOT approved 55-gallon drums. The roll-off was covered to prevent accumulation of precipitation and sealed to prevent release to the land surface. The liquids that separated from the solids and sludge was decanted from the roll-off container and added to the liquid IDW. The proper hazardous waste and Department of Transportation labels were placed on each container on the first day in which any waste was added to the container. A waste generation form was completed on the first day of waste generation. A weekly inspection of the waste containers occurred during the field activities and up to the point at which the waste containers were removed from the site for disposal. The waste type was identified by creating a waste profile (F032). The containers were labeled with the proper D.O.T. placards, manifested, and shipped off-site to an approved waste disposal facility (incineration). Please refer to Attachment D-4 for the analytical results obtained during waste profiling.

All non-hazardous IDW was disposed at the local sanitary landfill at the end of the remedial investigation activities.

29.0 SITE GEOLOGIC CONDITIONS

Site geologic conditions are presented in Section 5.3 of the June 1999 RI report.

30.0 SITE HYDROGEOLOGIC CONDITIONS

Site hydrogeologic conditions are presented in Section 5.5 of June 1999 RI report and Section 5.0 of this report.

31.0 ANALYTICAL RESULTS

All laboratory analytical reports for all samples collected during this investigation are located in Attachment D. All laboratory analytical reports for samples collected prior to the SRI are located in Attachment J of the June 1999 RI report.

Tabulated analytical results for all surface soils, subsurface soils, shallow aquifer groundwater, intermediate aquifer groundwater, deep aquifer groundwater, sediment, and surface water for all samples collected at the site to date are presented in tables located in Attachment F.

The list of constituents on the tabulated analytical results located in Attachment F were modified to include only constituents that have been detected at the site, by media, since sampling began (1983 to present). These modified tables are presented in this report as Tables 5 through 10.

For contaminant delineation purposes, preliminary remediation goals (PRGs) were determined for each detected constituent listed on the tables containing the previously detected constituents. On each table, as appropriate for each media, PRGs are listed for: Background, Default Residential Health, Default Industrial Health, calculated Site-Specific Risk-Based Concentrations, Protection-of-Groundwater, Groundwater Standards, Detection in Groundwater and Detection in Surface Water. Background samples only included samples that were recognized by NCDENR as representative of background conditions. Default residential and industrial PRGs were first derived from the NCDENR August 2001 Inactive Hazardous Site Program (IHSP) Guidelines for Assessment and Cleanup Tables 4-1 and 4-2 (Ref. 18). If a constituent was not listed in the IHSP than the USEPA Region 9 PRG Table (downloaded on August 20, 2001; Ref. 19) was used. For fish tissue PRG default values were derived from the USEPA Region 3 Risk-Based Concentration Table dated April 13, 2000 (Ref. 20). Site-Specific risk based concentrations were calculated following EPA guidance as described in the HHRA and ERA reports contained in Ref. 8 and 9.

Constituents that exceeded preliminary remedial action goals by media is listed in Section 22.1 of this report.

32.0 SOIL, GROUNDWATER, SEDIMENT, AND SURFACE WATER CONTAMINANT DELINEATION

The procedures suggested in Section 4.0 of the Inactive Hazardous Sites Program (IHSP) August 2001 Guidelines for Assessment and Cleanup program were used to establish site-specific remediation goals. The procedures for establishing remediation goals are consistent with the intent of CERCLA/SARA and the National Contingency Plan (NCP), as required by N.C.G.S. 130A-310.3. The procedures utilized are summarized below.

Soil and sediment preliminary remediation goals were determined for restricted site use. Presented in Ref. 14 is the voluntary consent for land use restrictions at the site signed and notarized by the NCSPA the property owner.

32.1 Soil Remedial Goal Determination

NCDENR has two soil remediation goals that must be obtained: a "health-based" remediation goal for total concentrations of contaminants; and a "protection of groundwater" remediation goal for leachable concentrations of contaminants. The remedial action must attain both soil remediation goals.

In accordance with IHSP, when developing a Remedial Action Plan (RAP) the remediating party shall attempt to design a remedial action alternative that will attain the PRGs. Remediation goals may be adjusted by NCDENR at the time of remedy selection if it is demonstrated that the goals cannot be obtained. If the preferred remedy can not achieve the remediation goals, NCDENR will re-establish goals based on the lowest concentration that can be achieved at the site, given that those levels must correspond to less than the maximum cumulative excess cancer risk of 1×10^{-4} and a hazard index of 1.

32.1.1 "Health-Based" Soil Remediation Goals for Restricted Land Use

It is proposed that NCDENR review and approve alternate soil remediation goals based on a restricted land-use exposure scenario. Presented in Ref. 8 is the HHRA report that provides the procedures used and calculations for the proposed alternate "health-based" soil remediation goals.

No new surface soil samples were collected during the SRI, only previously collected sample data was used for this evaluation. Soil samples collected from operation areas prior to landfarming (1985) were not used for soil delineation. These soils were excavated from impacted areas on-site and treated on the landfarm. Soil samples collected from the landfarm during active treatment were not used for landfarm soil delineation. However, landfarm soil samples collected after active landfarming (1990) were used for delineation.

Site-specific restricted land use soil PRGs have been exceeded in the surface and subsurface soil in the treated wood storage areas, landfarm area, production area, and covered ditch area (Figures 16, 17, 18 and 19). Inorganic concentrations appear to be naturally occurring, except in the drip track area in front of the former CCA treatment area. In 1984 the USGS completed a study that evaluated the naturally occurring inorganic concentrations across the United States. The naturally occurring ranges in the Wilmington area are listed in the Expanded Site Inspection on page 50. Multiple soil samples for inorganic analysis have been collected at the site and in the vicinity of the site providing a database of analytical data in which background concentration ranges can be observed. It is suggested that the ranges recommended by Black & Veatch in the ESI and the detected range of concentrations at background soil sample locations be used to evaluate naturally occurring background concentration for inorganics at the site. Based on this

evaluation all inorganic analyses in soil are considered naturally occurring background concentrations except for those soils in the immediate vicinity of the CCA treatment area.

In the non-treated wood storage area A, sample NTA7 has an arsenic concentration (63 mg/kg) that exceeds the PRG for arsenic. Background surface soil location SS-02 located off-site about 230 feet east of NTA-7 has an arsenic concentration of 56 mg/kg. It is believed that the arsenic concentration at NTA-7, the arsenic concentration (83 mg/kg) at sample location SS-20 adjacent to the Cape Fear River and the arsenic concentration (84 mg/kg) in the subsurface soil at landfarm 2 represent background naturally occurring levels for arsenic.

Dioxin and furan soil preliminary remediation goal exceedance is limited to the landfarms and the production area (Figures 17 and 19).

32.1.2 "Protection of-Groundwater" Soil Remediation Goals

In addition to meeting "health-based" remediation goals, soils must meet a "protection-of-groundwater" remediation goal. In accordance with IHSP the remediating party may use a laboratory leachate analysis model to determine the potential for soils to leach residual contamination to groundwater. NCDENR recommends the use of TCLP analysis to determine the leachability of contaminants. Soils that leach organic contaminants in excess of the groundwater remediation goals will require further remediation. Soils that leach metals in excess of the groundwater remediation goals (or natural leachable background concentrations, whichever are less stringent) will also require further remediation.

As an alternative to TCLP analysis, simple scientifically valid mathematical equations, employing site-specific field data for all parameters, can be used to calculate "protection-of-groundwater" remediation goals. The use of generic values for these parameters is not allowed.

At sites that meet any of the following three conditions, the "protection-of-groundwater" soil remediation goals do not apply:

1. Residual soil contaminant concentrations (mg/kg) for metals only, do not exceed the site-specific natural background concentrations;
2. Residual soil contaminant concentrations (in mg/kg) for both metals and organics, do not exceed values of twenty times the corresponding groundwater remediation goals (in mg/l);
3. Residual soil contaminant concentrations (in mg/kg) for metals and organics, do not exceed the health-based soil remediation goals (in mg/kg), and either (a) or (b) applies:

(a) the remediating party has determined that all on-site disposal and releases of hazardous substances occurred prior to 1980, and sampling demonstrates that groundwater is free of hazardous substances;

(b) the branch-approved remedial action plan for the site includes active groundwater remediation and demonstrates that the final remedy for groundwater will address any future leaching of contaminants from soil to groundwater.

Limited TCLP analysis has been conducted at the site. Not all constituents of concern were analyzed. TCLP analysis was completed in 1991 for soil in the former drip pad area, CCA area, and tank area for arsenic, chromium, lead, mercury, benzene, methyl ethyl ketone, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, cresol (ortho), cresol m&p, hexachlorobenzene, pentachlorophenol, pyridine, and total cresol. All of the constituents were non-detect in the leachate, except chromium from the drip pad and CCA areas. Chromium leached above the groundwater remediation goal for the site.

Mathematical equations (modeling), employing site-specific field data for all parameters to calculate "protection-of-groundwater" remediation goals has not been completed for the site. The models are vadose zone models that assume that there is a separation distance between the contaminated soils in the unsaturated zone and the groundwater. Groundwater at the site is between land surface and 3 feet below land surface indicating that separation between vadose zone soils and the groundwater required for valid modeling is not present at the site. In addition, it has been demonstrated that residual and saturated DNAPL exists at the site beneath the water table. This direct interaction of the groundwater with DNAPL will cause greater concentrations of constituents in the groundwater than leaching of the contaminants through the overlying soils. This in conjunction with the documented impact to the groundwater suggests that this modeling exercise is not necessary.

In regard to the exceptions noted above in 3(a) it is requested that the "protection-of-groundwater" soil remediation goals only apply to areas where on-site activities have impacted the groundwater (i.e. areas within the extent of groundwater impact). These areas would include the landfarm, large storage tank area, production area, and the covered ditch area. All other areas would be subject to only the "health-based" soil remediation goals. These areas that would be subject to only the "health-based" goals have been shown through multiple groundwater sampling events since 1981 to be free of groundwater contamination.

Any remedial action plan for site groundwater remediation, if not technically impracticable, would need to address any future leaching of contaminants from soil and residual DNAPL to the groundwater.

Since no TCLP data or site-specific mathematical calculations have been completed for the site, the "protection-of-groundwater" soil remedial goal for contaminant concentration evaluation is twenty times the groundwater remediation goal. However, as discussed, it is suggested that the "protection-of-groundwater" remediation goal only apply to soil located on-site within the extent of groundwater impact.

The soil PRG maps presented on Figures 16, 17, 18 and 19 are delineated for "health-based" soil PRG exceedance. The DNAPL extent map (Figure 25) and groundwater PRG maps presented on Figures 21, 22, 23 and 24 indicate the areas in which "protection-of-groundwater" soil remediation goals would apply.

32.2 Groundwater Remedial Goals

NCDENR's remediation goals for groundwater consist of the least stringent of: (i) the health-based remediation goals shown in Table 4-2 (IHSP); (ii) the method detection limits (using the analytical methods specified in section A.7.1.2 of IHSP); or (iii) natural background concentrations (metals only).

The health-based remediation goals shown in Table 4-2 (IHSP) are based on the lower of: (i) state groundwater standards (15A NCAC 2L .0202); (ii) federal Maximum Contaminant Levels (MCL's); or (iii) non-zero Maximum Contaminant Level Goals (MCLG's). For contaminants that are not listed on Table 4-2 NCDENR must be contacted for goal determination. Health-based remediation goals need to be determined for carbazole and 2-methylphenol (o-cresol). For delineation purposes, these constituents were screened using the USEPA Region 9 tap water concentrations adjusted for non-carcinogenicity.

32.2.1 Groundwater Contamination Extent Delineation

Delineation of the horizontal and vertical extent of groundwater contamination is evaluated in this report using the most current groundwater data collected from all wells (Figure 21) during February 2001 and the groundwater data collected in November 1996 by Black & Veatch during the ESI. The highest detected concentration for each constituent from the 1996 and 2001 sampling events were used for extent delineation (Table 6). All previously collected groundwater sampling data is listed on summary tables in Attachment F.

Health-based groundwater remediation goals for detected constituents are presented in tabular form on each groundwater contaminant delineation map. The lateral extent of groundwater contamination is shown for the shallow aquifer on Figures 21 and 22, the intermediate aquifer on Figure 23, and the deep aquifer on Figure 24. The vertical extent of groundwater contamination is also shown on cross-sections A - A' and B - B' on Figure 26.

Two contaminant plumes are present in the groundwater. On site plumes are shown originating from the landfarm and from the large storage tank area, the production area, and the covered ditch.

Constituents from the large storage tank area appear to be migrating toward the Cape Fear River. Constituents from the production and covered ditch areas appear to have migrated to the drainage ditch and Greenfield Creek. The eastern extent of this plume appears to have migrated off-site onto Optimist Park and the City of Wilmington pump station. The off-site constituents have all been detected at estimated concentrations (noted as "J" values on the laboratory reports) below the practical quantitation limit (PQL). Raw sewage was discharged to the Cape Fear River through a shallow 24-inch diameter pipe from what is now the City of Wilmington pump station adjacent to Optimist Park. The head of this pipe is located immediately adjacent to MW-37, MW-38 and MW-39. This discharge of raw sewage may be responsible for the groundwater contamination observed near MW-37, MW-38 and MW-39. The downgradient extent of the groundwater plume appears to be in the vicinity of MW-34, MW-35 and MW-36 along

Greenfield Creek. Documented groundwater contamination is present on the former Chevron bulk asphalt chemical storage facility located on the south bank of Greenfield Creek.

The landfarm plume appears to be migrating to the west/northwest toward the Cape Fear River and the drainage ditch along the northern property boundary.

During this investigation dioxins/furans were analyzed in unfiltered samples from five shallow aquifer monitoring wells on the site (Figure 22). Preliminary remediation goals were exceeded at all five wells. Subsequently, filtered samples were collected at upgradient well MW-17 and at the worst case well MW-12. In both filtered samples the results are below the dioxin/furan preliminary remediation goals. Using the filtered data results from the worst case well (MW-12) as an indicator, it can be assumed that all wells would be below the dioxin/furan PRGs for the site.

32.2.2 DNAPL Extent Delineation

Creosote is a dense non-aqueous phase liquid (DNAPL). As a whole, the constituents that make up creosote are slightly heavier than water, have a high viscosity, and low dissolved phase mobility. Because wood-preserving constituents are heavier than water and have a viscosity greater than water, gravity and interfacial tension between the DNAPL and groundwater play an important role in the migration of the DNAPL. The DNAPL will continue to migrate vertically downward in the subsurface until it intercepts a barrier to its vertical migration. The barrier to migration can be a fine-grained layer (peat) or clay or any material in which the pore spaces are smaller than that of the host material. If the barrier is flat lying, the DNAPL will begin to pool and spread laterally on this barrier until a critical pool height is reached. The critical pool height is the height of the DNAPL pool required to exceed the entry pressure (capillary pore pressure and interfacial tension) within the pores of the material restricting the movement of the DNAPL. Once this critical pool height is reached, the DNAPL will then begin to flow through the original barrier to flow. Once the entrance pressure is achieved and flow through the barrier has begun, the reduced interfacial tension can allow the entire DNAPL pool to drain leaving only residual DNAPL behind. If the barrier encountered is sloping, the DNAPL will most likely flow by gravity downslope until another barrier to flow is encountered causing the DNAPL to pool. This can continue until the required entry pressure cannot be met or until the separate phase fluid volume is reduced to residual concentrations.

As the DNAPL is migrating through porous media, residual DNAPL is left behind the trailing edge of the moving DNAPL body due to snap-off and by-passing mechanisms. It can be expected that an estimated 20 percent of the DNAPL body will be left behind as residual during free-phase migration. After a certain distance of migration, the free phase will be reduced to just residual concentrations.

The DNAPL extent was delineated in the shallow aquifer by completing 73 GeoProbe™ continuous cores to the top of the peat layer at the site (Figures 25 and 26). The horizontal position and land surface elevation at each GeoProbe™ location was surveyed. Based on the corehole and survey data a top-of-peat surface elevation map was produced. The top of the peat unit is at its highest elevation southeast of the covered ditch in the wetland area and the along the

drainage ditch. From this area the top of the peat slopes to the west toward the Cape Fear River. Topographic lows are located in the vicinity of the covered ditch, the production area and the large storage tank area.

On Figures 25 and 26 areas of pooled DNAPL are indicated as zones of pumpable/flowable DNAPL. Areas of residual DNAPL are also indicated on the map. Residual DNAPL is present in areas that DNAPL has migrated through and pooled at another location or has been reduced to residual levels during migration. Areas of residual DNAPL most likely cannot be pumped for recovery.

DNAPL has pooled on top of the peat beneath the large storage tank area. The vertical extent of the DNAPL beneath the large storage tank area was confirmed by completing a GeoProbe™ continuous core (GP-72) through the peat and to the top of the lower clay at the base of the intermediate aquifer.

DNAPL has pooled on top of the peat beneath the production area and the covered ditch. It appears that the DNAPL has also migrated through the peat layer and has begun to accumulate on top of the lower clay in the intermediate aquifer. GeoProbe™ cores and soil borings completed through the peat layer in the production area and along the western portion of the covered ditch have indicated the absence of DNAPL in the peat. DNAPL was observed in the peat in the corehole for MW-26A completed at the eastern end of the covered ditch. Even though DNAPL has not been observed in the peat beneath the production area and the western end of the covered ditch, its presence on top of the lower clay at MW-11B and in MW-44A suggests that DNAPL has also migrated through the peat layer in these areas.

32.3 Sediment Remediation Goals

Remediation goals for sediment are based on the most stringent of: (i) the health-based soil remediation goals listed in Table 4-1 of IHSP (or the upstream "background" concentrations, if less stringent); and (ii) remediation goals sufficient to ensure that contaminated sediment will not cause exceedances of the remediation goals for groundwater and surface water.

Remediation goals may be adjusted by NCDENR at the time of remedy selection, if warranted. If the preferred remedy can not achieve the remediation goals, NCDENR will establish levels based on the lowest concentration that can be achieved at the site given that those levels must correspond to less than the maximum cumulative excess cancer risk of 1×10^{-4} and a hazard index of 1.

If contaminated sediments are located in a wetland or other sensitive environment, NCDENR will weigh the benefit of active remediation with the need for protecting and preserving sensitive environments. Instead of active remedies NCDENR may elect to use passive remedies or institutional controls.

At sites with surface water contamination, it may be necessary to plan the remedial action to address continuing source areas first.

It is proposed that NCDENR review and approve alternate sediment remediation goals based on a restricted land-use exposure scenario. Presented in Ref. 8 and 9 are the HHRA and ERA reports that provide the procedures used and calculations for the proposed alternate "health-based" and "ecological-based" sediment remediation goals. These goals are shown on Tables 8-1 through 8-5 and Figures 27 and 28. NCSPA owns the property on both sides of the drainage ditch and Greenfield Creek. Because contaminated sediments are located in a wetland and site use is restricted, final sediment remediation goals are requested from NCDENR.

Since the net discharge of groundwater is to the surrounding surface water bodies it is believed that the sediments are not causing groundwater contamination. Because no semi-volatile or volatile constituents and only limited inorganics, at background levels, have been detected in the surface water adjacent to the site, it is believed that the sediments are also not causing surface water contamination.

Sediment samples have been collected from the on site drainage ditch, Greenfield Creek, and the Cape Fear River (Figure 27). Preliminary "health-based" sediment remediation goals have been exceeded for arsenic at SD-24 located along the drainage ditch near non-treated wood storage area B. However, background sediment sample SD-41 located northeast of SD-24 across the railroad tracks detected arsenic at a concentration of 120 mg/kg dw, suggesting that the arsenic concentration at SD-24 represents naturally occurring background concentrations not a PRG exceedance. Goals for benzo(a)pyrene and benzo(b)fluoranthene were exceeded in Greenfield Creek at SS-10 next to the documented groundwater impact at the former Chevron bulk storage facility. However, SS-10 was resampled (SS-10A) and was below the PRGs. Dioxins/Furans exceeds the PRG at SD-26 and SD-28 in the drainage ditch below the covered ditch (Figure 28).

Toxicity assays were completed on sediment samples obtained from the drainage ditch and Greenfield Creek (Ref. 10). The survivability of an amphipod and a midge were evaluated (Figure 29). The amphipod and the midge did not survive in the drainage ditch sediments. They survived in Greenfield Creek except at the location of documented groundwater impact at the former Chevron facility.

32.4 Surface Water Remedial Goals

Preliminary remediation goals for surface water are established by the Division of Water Quality (DWQ) using State or Federal surface water standards for the protection of human health and/or aquatic life. Final remediation goals will be set at the DWQ standards or upstream "background" concentrations, whichever are less stringent, with the exception of the following two conditions: (1) if surface water contamination is causing sediments to exceed cleanup criteria, remediation of surface water will be necessary to eliminate this effect; (2) if remediation of surface water is determined to cause unreasonable harm to a wetland (or other protected environment) alternate goals will be determined by NCDENR.

Surface water classifications in North Carolina are divided between freshwater and tidal saltwater. Surface water bodies adjacent to the site have been classified as tidal saltwater by NCDENR. Greenfield Creek and the on-site tributaries are classified as Class SC-Swamp. The Cape Fear River is classified as Class SC tidal saltwater. Class SC waters are designated as

waters suitable for aquatic life propagation and maintenance of biological integrity, wildlife, secondary recreation, and any other usage except primary recreation or shellfishing for market purposes. Fish tissue sampling indicated that Greenfield Creek contained freshwater except for the area adjacent to the tidal gate.

For surface water delineation (Figure 30), the most stringent of tidal saltwater Class SC and freshwater Class C/WS-IV standards published in NCAC Title 15A Subchapter 2B .100 were used for this report.

Surface water samples have been collected from the drainage ditch, Greenfield Creek, and the Cape Fear River (Figure 30). All of the surface water samples have historically been below surface water PRGs except for copper, cyanide, iron, manganese, PCB-1260 and Alpha-Chlordane/2. The greatest concentrations detected for copper, cyanide, iron and manganese occurred in the background surface water sample SW-01 near the entrance to the site. PCB-1260 and Alpha-Chlorodane/2 were detected in Greenfield Creek at the background sample location and in the drainage ditch, Greenfield Creek, and the Cape Fear River. These two constituents are not considered site-related constituents and are considered to represent background concentrations for the area.

32.5 Fish Remedial Goals

Fish tissue samples were collected in April 2001 from Burnt Mill Creek, Greenfield Lake, Greenfield Creek, and the on-site drainage ditch and analyzed for dioxins/furans, semi-volatiles and inorganics (Figures 31 and 32). No fish tissue samples were obtained from the drainage ditch because no fish were present. However, the drainage ditch is connected to Greenfield Creek. Any fish in Greenfield Creek are free to swim up the drainage ditch to the site. The results from the fish tissue analyses were compared to the USEPA Region III Risk-Based Concentration Table (April, 2000) for fish ingestion. All results are below the Risk-Based Concentration for each constituent of concern.

33.0 SPECIAL ASSESSMENTS

The Human Health Risk Assessment is located in Ref. 8. The Ecological Risk Assessment is located in Ref. 9. Ecotoxicity Testing and Chronic Exposure Assessment of the drainage ditch and Greenfield Creek are presented in Ref. 10. No other special assessments have been conducted at the site.

33.1 Human Health Risk Assessment

Site environmental sampling data from 1990 to present were screened using conservative US EPA Region IX Preliminary Remediation Goals (PRGs), as well as US EPA Region III Risk Based Concentrations (RBCs) in cases where PRGs were not available. Additional screening decision points included frequency of detection, comparison with background levels, essential nutrients, tentatively identified compound (TICs), and field blank or laboratory blank contaminant issues.

Under current exposure conditions, a hypothetical adolescent trespasser was evaluated contacting soil via the soil ingestion and dermal contact exposure routes, and fish ingestion exposure pathways. For foreseeable future conditions, three receptor groups were evaluated: a hypothetical utility worker, construction worker, and facility worker (if and when the site was to be re-developed for active use). For the hypothetical utility/construction worker exposures, pathways of potential exposure included incidental soil ingestion, dermal contact, and inhalation of entrained dust. For the future site worker, dominant exposure routes were incidental soil ingestion and dermal contact with surficial soil.

A point-by-point comparison of RBCs with site media concentrations of COPC revealed that there are some exceedances of individual receptor- and media-specific RBCs. Nevertheless, it must be recognized that an individual would not, in all probability, be exposed to COPC at one unique location. Thus, a point-specific exceedance of a RBC does not, in and of itself, constitute a potential cause for concern given the likelihood that true human exposures would more realistically occur over an area (and thus would be more indicative of exposure to site-wide averages COPC concentrations).

33.2 Ecological Risk Assessment

Site environmental sampling data from 1990 to present were evaluated using the methodology presented in EPA's Ecological Risk Assessment Guidance for Superfund (ERAGS; 1997a) and EPA Region IV Ecological Risk Assessment Bulletins (EPA, 2001a), which serve as a supplement to ERAGS.

Four Assessment Endpoints and eight Measurement Endpoints were used to assess the potential ecological risks at the Site. Receptors of interest include benthic invertebrates, fish, upper trophic level piscivorous birds (i.e., great blue heron), upper trophic level carnivorous birds (i.e., red-tailed hawk), and upper trophic level piscivorous mammals (i.e., mink). Both empirical and modeled prey chemical concentrations were used in this BERA.

Key ERA results from the evaluation of 60 chemicals of potential concern (COPCs) include the following:

- Benthic Populations: Several metrics were used to assess the potential risk to benthic populations, and these are summarized below:
 - PCB-1260 and lead exceeded AWQS or state WQS criteria in the surface water samples. Several of the COPCs were above the sediment quality guidelines (SQGs).
 - A qualitative field survey performed as part of the SLERA (ChemRisk, 1996) indicated the presence of macroinvertebrate species typical of slow moving shallow waterbodies. A detailed enumeration or identification of these species was not performed.

- The AVS/SEM results suggest that most of the divalent metals would be associated with insoluble sulfides and not bioavailable for receptor uptake. Other metals are likely bound by organic complexing agents (i.e., TOC).
- Sediments collected within the drainage ditch and Greenfield Creek exhibited toxicity, based on the amphipod and chironomid tests that were performed.
- In summary, the line of evidence indicates the potential for an impact on the benthic organisms present within the drainage ditch and the creek. This is likely due to the organic COPCs detected in the sediment samples.

- Fish Populations

- As with the benthic assessment endpoint, PCB-1260 and lead exceeded AWQS or state WQS criteria in the surface water samples. Several of the COPCs were above the SQGs.
- Comparison of tissue body burdens to NOELs compiled in the USACE ERED database showed that all but one COPC (copper) were below the tissue levels that may elicit a toxic effect.

- Great Blue Heron

- Potential risk to the Great Blue Heron (receptor representing upper trophic level piscivorous avian populations) was evaluated using the HQ method. Both empirical and modeled biota concentrations were used to estimate exposures. The HQs for eight of the 60 COPCs exceeded one, however, only HQs for benzo(b)fluoranthene (39) and PCBs (60.6) are greater than ten. Review of the dose calculations showed that these exceedances were associated with exposure to invertebrates (which represented about 1% of the diet) that were based on modeled concentrations.

- Red-Tailed Hawk

- Potential risk to the Red-Tailed Hawk (receptor representing upper trophic level predaceous avian populations) was evaluated using the HQ method. Both empirical and modeled biota concentrations were used to estimate exposures. The HQs for all COPCs were below one, except for benzo(g,h,i)perylene (HQ of 2.2). This is not considered to be significant since a conservative model was used to estimate the principal prey item (small mammals) for this species.

- Mink

- Potential risk to the Mink (receptor representing upper trophic level piscivorous mammals) was evaluated using the HQ method. Both empirical and modeled biota

concentrations were used to estimate exposures. The HQs for all COPCs were below one.

Weight-of-evidence and determination of the Ecological Significance and Relevance of the ERA results was also performed. Based on these results, the upper trophic level populations are not predicted to be at a significant risk. However, since the sediments within the drainage ditch and Greenfield Creek are exhibiting toxicity, and the lower trophic level community serve indirectly as a prey base for the evaluated higher trophic levels, consideration to improving sediment quality in this area would enhance the desirable upper trophic level receptor populations. However, any corrective action, should be weighted against probable future use of the Site by the North Carolina Ports Authority.

33.3 Ecotoxicity Testing and Chronic Exposure Assessment

Bioassay results (for both survival and growth) of sediment samples from the drainage ditch and Greenfield Creek were compared to results from both an upstream sample taken from Greenfield Creek (considered a reference site) and from two control samples used in the laboratory. For the amphipod, survival results for the upstream reference station, the two laboratory control samples, and the sample from Greenfield Creek onsite just above the mouth of the creek are not significantly different. However, the other two Greenfield Creek samples onsite, and the two drainage ditch samples, exhibited significantly less survival than the reference location and laboratory controls. For amphipod growth, results for the drainage ditch samples and one Greenfield Creek onsite sample were significantly less than reference. Midge survival results paralleled those of the amphipod survival. For the midge growth tests, however, the two laboratory control results were significantly less than the reference site, as were the two ditch samples and one sample from Greenfield Creek.

34.0 FIELD LOGS, NOTES, AND PHOTOGRAPHS

All field logs and notes are included in Attachment C to this report. Site photographs are included in Attachment E.

35.0 CERTIFICATION

Certification for this report is provided at the beginning of this report.

36.0 REFERENCES

1. Schnabel Engineering, Inc., May 2000, Draft 2.0 Supplemental Remedial Investigation Workplan, Southern Wood Piedmont and North Carolina State Ports Authority Site, Wilmington, New Hanover County, North Carolina, NCD 058 517 467.
2. NCDENR, September 2000, Approval of Supplemental Remedial Investigation Workplan Revision 2.0, Southern Wood Piedmont Site, Wilmington, New Hanover County, North Carolina, USEPA ID: NCD 058 517 467.
3. Blasland, Bouck & Lee, Inc., August 2001, June 2001 Groundwater Monitoring Report, Former Chevron Asphalt Terminal, Wilmington, New Hanover County, North Carolina, Groundwater Incident No. 9745
4. Amerada Hess Boring and Well Construction Logs and Site Map.
5. NCDENR, Division of Parks and Recreation Natural Heritage Program, March 2001, Sensitive Environments in the Wilmington Area, New Hanover County.
6. USDI, Fish and Wildlife Service, April 2001, Endangered Species and Terrestrial Areas Utilized for Breeding by large or Dense Aggregations of Animals, Wilmington, North Carolina.
7. NCDCCR, State Historic Preservation Office, April 2001, Properties of Architectural, Historic or Archaeological Significance, North Carolina State Ports Authority Site Remediation, Wilmington, New Hanover County, ER 01-9153.
8. AMEC Earth and Environmental, October 2001, Supplemental Human Health Risk Evaluation, Southern Wood Piedmont Company, NCD 058 517 467, Wilmington, North Carolina.
9. AMEC Earth and Environmental, October 2001, Ecological Risk Assessment, Southern Wood Piedmont Company, NCD 058 517 467, Wilmington, North Carolina
10. AMEC Earth and Environmental, April 2001, Toxicity Evaluation of Southern Wood Piedmont Sediments, Wilmington, North Carolina, Final Draft.
11. USEPA Region IV, May 1996 (with 1997 revisions), Environmental Investigations Standard Operating Procedures and Quality Assurance Manual.
12. Paradigm Analytical Laboratories, Inc., August 2000, Quality Assurance Document for Schnabel Engineering.
13. NCSPA, September 2001, Voluntary Consent for Land Use Restrictions, Former Southern Wood Piedmont Site, Port of Wilmington.

14. Schnabel Engineering, Inc., Supplemental Remedial Investigation Health and Safety Plan Review Acknowledgement Form.
15. Black & Veatch, July 1997, Expanded Site Inspection of Southern Wood Piedmont, Wilmington, New Hanover County, North Carolina.
16. Schnabel Engineering, Inc., October 2000, Request to Perform High Resolution Dioxin/Furan Analysis by USEPA Method 1613, Southern Wood Piedmont Site, Wilmington, New Hanover County, North Carolina, USEPA ID: NCD 058 517 467.
17. NCDENR, October 2000, Approval to Perform High Resolution Dioxin/Furan Analysis by USEPA Method 1613, Southern Wood Piedmont Site, Wilmington, New Hanover County, North Carolina, USEPA ID: NCD 058 517 467.
18. NCDENR, August 2001, Inactive Hazardous Sites Program, Guidelines for Assessment and Cleanup.
19. USEPA Region 9, November 2000, Preliminary Remediation Goals for the Superfund/RCRA Programs.
20. USEPA Region 3, April 2000, Risk-Based Concentration Table.

**TABLE 1. GROUNDWATER ELEVATIONS THROUGH A FULL TIDAL CYCLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY
WILMINGTON, NORTH CAROLINA**

WELL	RISER	WELL	DEPTH TO GW				GW ELEVATION			
	ELEV	DEPTH	2/20/01 @ 7:00	2/20/01 @ 10:00	2/20/01 @ 13:00	2/20/01 @ 16:00	2/20/01 @ 7:00	2/20/01 @ 10:00	2/20/01 @ 13:00	2/20/01 @ 16:00
MW-6	5.96	19.78	3.72	3.67	3.68	3.68	2.24	2.29	2.28	2.28
MW-7	6.63	19.52	5.09	5.03	5.15	5.24	1.54	1.60	1.48	1.39
MW-8	7.00	19.02	5.11	5.12	5.08	5.08	1.89	1.88	1.92	1.92
MW-8A	6.43	30.75	3.95	4.04	4.40	4.54	2.48	2.39	2.03	1.89
MW-9	7.00	19.22	5.05	5.02	4.99	5.02	1.95	1.98	2.01	1.98
MW-10	7.41	10.50	5.12	5.06	5.07	5.09	2.29	2.35	2.34	2.32
MW-11	8.02	10.50	5.69	5.60	5.26	5.38	2.33	2.42	2.76	2.64
MW-11A	6.38	33.89	4.24	4.19	4.15	4.26	2.14	2.19	2.23	2.12
MW-11B	6.26	42.19	4.13	4.09	4.56	4.56	2.13	2.17	1.70	1.70
MW-12	8.22	10.50	5.91	5.93	5.80	5.85	2.31	2.29	2.42	2.37
MW-13	6.97	10.50	5.02	4.97	4.97	5.02	1.95	2.00	2.00	1.95
MW-14	6.30	16.00	4.65	4.68	4.60	4.56	1.65	1.62	1.70	1.74
MW-14A	5.05	31.15	3.20	3.16	3.14	3.20	1.85	1.89	1.91	1.85
MW-15	7.07	10.50	4.98	4.98	4.95	4.97	2.09	2.09	2.12	2.10
MW-16	7.69	10.50	5.83	5.81	5.86	5.89	1.86	1.88	1.83	1.80
MW-17	7.65	10.50	5.61	5.69	5.68	5.72	2.04	1.96	1.97	1.93
MW-18	6.61	11.13	4.80	4.91	5.11	5.13	1.81	1.70	1.50	1.48
MW-19	5.44	12.87	3.34	3.35	3.27	3.28	2.10	2.09	2.17	2.16
MW-19A	5.25	31.17	3.21	3.13	3.18	3.35	2.04	2.12	2.07	1.90
MW-20	5.44	12.30	3.33	3.34	3.32	3.33	2.11	2.10	2.12	2.11
MW-20A	5.23	30.98	3.02	2.98	3.02	3.09	2.21	2.25	2.21	2.14
MW-21	5.34	6.79	3.56	3.56	3.58	3.60	1.78	1.78	1.76	1.74
MW-22	5.26	11.11	3.39	3.63	3.87	3.95	1.87	1.63	1.39	1.31
MW-22A	5.32	31.86	3.17	3.15	3.30	3.43	2.15	2.17	2.02	1.89
MW-23	4.96	9.06	3.00	2.97	2.98	3.03	1.96	1.99	1.98	1.93
MW-24R	5.98	13.40	3.84	3.86	3.78	3.78	2.14	2.12	2.20	2.20
MW-24A	5.81	34.28	3.86	3.79	3.83	3.95	1.95	2.02	1.98	1.86
MW-25	4.96	12.05	2.22	2.21	2.21	2.20	2.74	2.75	2.75	2.76

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	ELEV	DEPTH	2/20/01 @ 7:00	2/20/01 @ 10:00	2/20/01 @ 13:00	2/20/01 @ 16:00	2/20/01 @ 7:00	2/20/01 @ 10:00	2/20/01 @ 13:00	2/20/01 @ 16:00
MW-26	4.91	17.62	4.71	4.70	4.65	4.65	0.20	0.21	0.26	0.26
MW-26A	5.11	40.80	3.68	3.64	3.65	3.69	1.43	1.47	1.46	1.42
MW-27	5.41	5.12	2.18	2.18	2.17	2.15	3.23	3.23	3.24	3.26
MW-28	5.18	11.07	4.45	4.46	4.44	4.44	0.73	0.72	0.74	0.74
MW-28A	5.47	25.68	4.15	4.13	4.11	4.15	1.32	1.34	1.36	1.32
MW-29	5.32	7.23	4.00	4.02	4.00	4.00	1.32	1.30	1.32	1.32
MW-29A	5.14	38.98	3.56	3.45	3.47	3.50	1.58	1.69	1.67	1.64
MW-30	6.26	9.02	4.46	4.47	4.46	4.48	1.80	1.79	1.80	1.78
MW-31	6.63	17.32	5.04	5.05	5.05	5.04	1.59	1.58	1.58	1.59
MW-32	6.22	45.39	4.16	4.08	4.43	4.72	2.06	2.14	1.79	1.50
MW-33	5.92	55.27	3.55	3.54	4.13	4.50	2.37	2.38	1.79	1.42
MW-34	8.13	16.24	7.88	7.92	7.89	7.95	0.25	0.21	0.24	0.18
MW-35	7.71	38.94	5.86	5.77	5.76	5.87	1.85	1.94	1.95	1.84
MW-36	7.93	51.02	6.07	5.98	5.98	6.09	1.86	1.95	1.95	1.84
MW-37	5.97	16.67	4.98	4.65	4.65	4.62	0.99	1.32	1.32	1.35
MW-38	5.91	26.64	4.57	4.57	4.54	4.53	1.34	1.34	1.37	1.38
MW-39	5.75	52.47	1.35	1.22	1.28	1.19	4.40	4.53	4.47	4.56
MW-40	8.20	16.28	6.36	6.37	6.35	6.36	1.84	1.83	1.85	1.84
MW-41	7.66	40.18	4.83	5.04	5.30	5.42	2.83	2.62	2.36	2.24
MW-42	7.68	66.90	4.43	4.86	5.23	5.38	3.25	2.82	2.45	2.30
MW-43	5.86	21.56	3.96	3.93	3.96	4.04	1.90	1.93	1.90	1.82
MW-44	3.98	15.40	2.49	2.48	2.44	2.44	1.49	1.50	1.54	1.54
MW-44A	4.34	42.54	2.64	2.60	2.56	2.62	1.70	1.74	1.78	1.72
MW-45	7.25	18.38	4.98	5.00	4.90	4.81	2.27	2.25	2.35	2.44
ORW-1	7.18	20.46	4.92	4.94	4.84	4.79	2.26	2.24	2.34	2.39

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SG*-CFR	-3.16	NA	5.76	5.06	1.84	4.83	2.60	1.90	-1.32	1.67
SG*-CFR	-2.59	NA	5.19	3.87	1.57	4.58	2.60	1.28	-1.02	1.99
SG*-GFC	-1.01	NA	0.07	0.40	0.27	-0.50	-0.94	-0.61	-0.74	-1.51
SC*-GFC	-1.08	NA	0.18	0.51	0.31	0.00	-0.90	-0.57	-0.77	-1.08
SC*-DD	-1.24	NA	Dry	0.68	Dry	Dry	< -0.75	-0.56	< -0.75	< -0.75
Hess Wells										
AST-MW	7.33	8.25	2.57	2.58	2.57	2.54	4.76	4.75	4.76	4.79
MW-3	4.78	10.30	1.11	1.13	1.04	1.04	3.67	3.65	3.74	3.74
MW-4	4.76	10.44	1.13	1.13	1.08	1.05	3.63	3.63	3.68	3.71
AST-MW	6.31	29.83	1.63	1.51	1.55	1.51	4.68	4.80	4.76	4.80
AST-MW	6.92	5.50	2.38	2.37	2.37	2.37	4.54	4.55	4.55	4.55
MW-7	5.43	24.82	2.29	2.31	2.40	2.52	3.14	3.12	3.03	2.91
AST-MW	10.15	12.50	5.40	5.41	5.38	5.36	4.75	4.74	4.77	4.79
AST-MW	7.17	10.00	3.26	3.31	3.26	3.24	3.91	3.86	3.91	3.93
Vopak Wells										
MW-1	7.35	13.75	5.88	5.91	5.85	5.84	1.47	1.44	1.50	1.51
MW-2	9.10	14.84	9.60	9.57	9.57	9.58	-0.50	-0.47	-0.47	-0.48
MW-3	6.53	13.60	6.55	6.55	6.53	6.53	-0.02	-0.02	0.00	0.00
MW-4	6.87	7.81	4.50	4.48	4.48	4.48	2.37	2.39	2.39	2.39
MW-5	5.32	13.64	5.82	5.75	5.72	5.80	-0.50	-0.43	-0.40	-0.48
MW-6	9.52	15.43	10.21	10.12	10.08	10.20	-0.69	-0.60	-0.56	-0.68
MW-7	6.93	10.92	7.52	7.42	7.36	7.57	-0.59	-0.49	-0.43	-0.64
MW-8	7.79	16.01	8.68	8.68	8.64	8.68	-0.89	-0.89	-0.85	-0.89
MW-9	6.62	13.55	7.18	7.00	6.98	7.11	-0.56	-0.38	-0.36	-0.49
MW-10	7.28	11.51	7.35	7.31	7.29	7.31	-0.07	-0.03	-0.01	-0.03
MW-11	6.31	14.15	6.05	6.02	6.02	6.01	0.26	0.29	0.29	0.30
MW-12	6.36	12.75	6.21	6.17	6.16	6.18	0.15	0.19	0.20	0.18
MW-13	6.95	13.65	7.10	7.05	7.00	7.05	-0.15	-0.10	-0.05	-0.10

Note:

GW = Groundwater; SG = Staff Gauge; CFR = Cape Fear River; GFC = Greenfield Creek; DD= Drainage Ditch
All measurements are in feet.

**TABLE 2. DEGRADATION COMPARISON BETWEEN THE 1991 LANDFARM SOIL
SAMPLE ANALYSIS AND THE 1996 LANDFARM SOIL SAMPLE ANALYSIS**

CONSTITUENTS DETECTED	1991 LF1U	1996 LF1A	1991 LF1L	1996 LF1B	1991 LF2U	1996 LF2A	1991 LF2L	1996 LF2B
Phenanthrene	17	2	7.5	2.8	36	4.2	35	2.8
Naphthalene	2.6	ND						
2-Methylnaphthalene	3.8	ND	ND	ND	6.4	ND	ND	ND
1,1-Biphenyl	0.8	ND						
Acenaphthylene	2.1	ND	1.1	ND	4.5	ND	ND	ND
Acenaphthene	0.65	ND	ND	ND	ND	ND	21	ND
Dibenzofuran	4.1	ND	ND	ND	8.2	ND	ND	ND
Fluorene	33	ND	ND	ND	24.4	ND	ND	ND
Pyrene	25	ND	30	ND	31.2	ND	283	ND
Dibenzo(a,h)anthracene	0.9	ND	1.2	ND	ND	ND	10.4	ND
Anthracene	121	5.7	5.4	ND	122	10	75	5
Carbazole	35	ND	1.9	ND	64	2.2	20	ND
Benzo(a)anthracene	11	6.9	13	4	15	7	49	4.3
Chrysene	12	8.7	16	5.8	18	8	59	5.5
Benzo(a)pyrene	12	8.1	8.5	4.6	17	9.2	27	6.2
Fluoranthene	20	10	34	8.1	35	11	201	8.2
Benzo(g,h,i)perylene	5	ND	3.7	ND	7.1	ND	6	ND
Pentachlorophenol	0.7	ND	ND	ND	ND	ND	41	ND
Benzo(b,k)fluoranthene	33	19.5	24.5	12.9	36	20.7	83	14.5
Indeno(1,2,3-cd)pyrene	6.5	5.1	4.9	3.2	9.5	7.4	10	5.3
Total PAHs	346.15	66	151.7	41.4	434.3	79.7	920.4	51.8
Total PAHs LF1 1991	497.85							
Total PAHs LF1 1996	107.4							
Total PAHs LF2 1991	1354.7							
Total PAHs LF2 1996	131.5							

Results are in mg/kg dw

LF1 - Landfarm 1

LF2 - Landfarm 2

A,U - Upper soil sample taken approximately 3" below landfarm surface

L,B - Lower sample taken within bottom 6" of landfarm material

TABLE 3. DNAPL RECOVERY EVALUATION
11/13/00 - 11/22/00
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Monitoring Well	DNAPL Thickness	Well Sump Length	True DNAPL Thickness ¹	Maximum Pump Rate ²	Initial Recovery Cycle ³
MW-14	0.45		0.45	0.10 gal/day	0.10 gallons once every 24 hours
MW-26	1.95	1.00	0.95	0.17 gal/day	0.17 gallons once every 24 hours
MW-26A	3.29	0.80	2.49	1.92 gal/day	0.16 gallons once every two hours
MW-43	5.10	1.20	3.90	13.74 gal/day	0.57 gallons once every hour
MW-44	6.35	0.92	5.43	7.44 gal/day	0.31 gallons once every hour
MW-44A	2.90	1.00	1.90	3.32 gal/day	0.14 gallons once every hour
MW-45	3.92	0.43	3.49	13.36 gal/day	0.56 gallons once every hour

Notes:

All measurements are in feet unless otherwise specified.

¹ DNAPL thickness measured in well minus length of well screen and sump below peat/clay layer.

² Maximum pump rate estimated from DNAPL recovery test. Actual product recovery rate will likely decrease with prolonged pumping and DNAPL depletion.

³ The recovery cycle is the time interval at which the pump would be turned on. The pump would remain on until the stated volume is pumped from the well.

Oil recovery well ORW-1 would be pumped at the time interval listed for MW-45.

**TABLE 4. SRI SAMPLE SUMMARY TABLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Sample Code	Date	Sample Media	Sample Location	Depth/Aquifer	Sample Method	Justification	Consultant	Parameter	Analytical Method
SS-2DF	2001	Subsurface Soil	Southeast of site Optimist Park	>2'	Stainless Steel Hand Auger	To establish background levels	Schnabel	2001 Dioxins/Furans	2001 1613
SS-6DF	2001	Subsurface Soil	CCA & Creosote Treatment Area	>2'	Stainless Steel Hand Auger	To confirm presence or absence of contamination	Schnabel		
SS-13DF	2001	Subsurface Soil	Covered Ditch Area	>2'	Stainless Steel Hand Auger	To confirm presence or absence of contamination	Schnabel		
SS-13DF-Dup	2001	Subsurface Soil	Covered Ditch Area	>2'	Stainless Steel Hand Auger	To confirm presence or absence of contamination	Schnabel		
SS-14DF	2001	Subsurface Soil	Landfarm 1 & Landfarm 2	>2'	Stainless Steel Hand Auger	To confirm presence or absence of contamination	Schnabel		
SS-17DF	2001	Subsurface Soil	Between Greenfield Creek and the earthen berm	>2'	Stainless Steel Hand Auger	To confirm presence or absence of contamination	Schnabel		
BK-S1DF	2000	Sediment	Overflow stream from Greenfield Lake	Surface	Stainless Steel Hand Auger	To establish background levels	Schnabel	2000-2001 Dioxins/Furans	2000-2001 1613
SS-1	2001	Sediment	East of railroad crossing in Greenfield Creek	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Semi-Volatiles	8270C
SS-2	2001	Sediment	East of the site in offsite ditch	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Volatiles	8260
SS-3	2001	Sediment	East of the site near the entrance gates	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Total Organic Carbon	9060
SS-4	2001	Sediment	Ditch southeast of MW-26	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Ammonia	350.1
SS-5	2001	Sediment	Ditch southeast of MW-14	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Arsenic	6010
SS-6	2001	Sediment	Ditch southeast of MW-14	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Chromium	6010
SS-7	2001	Sediment	Ditch southeast of MW-26	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Copper	6010
SS-7-Dup	2001	Sediment	Ditch southeast of MW-26	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Arsenic	6010
SS-9DF	2000	Sediment	Mouth of Greenfield Creek	0 - 3"	Stainless Steel Spoon or Hand Auger	To determine presence or absence of contamination	Schnabel	Chromium	6010
SS-10ADF	2000	Sediment		0 - 3"	Stainless Steel Spoon or Hand Auger	To determine presence or absence of contamination	Schnabel	Copper	6010
SS-11	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Chromium	6010
SS-12	2001	Sediment	Tributary to Greenfield Creek southwest of railroad crossing	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Copper	6010
SS-13	2001	Sediment	Tributary to Greenfield Creek southwest of railroad crossing	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Chromium	6010
SS-15	2001	Sediment	Northwest property boundary in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Copper	6010
SS-16DF	2000	Sediment	North Slip in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To determine presence or absence of contamination	Schnabel	Chromium	6010
SS-17	2001	Sediment	Near former Pier in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Copper	6010
SS-18	2001	Sediment	Near former Pier in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Chromium	6010
SS-19DF	2000	Sediment	Southern Slip in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To determine presence or absence of contamination	Schnabel	Copper	6010
SS-20	2001	Sediment	Southern Slip in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Chromium	6010
SS-21DF	2000	Sediment	Southern Slip in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To determine presence or absence of contamination	Schnabel	Copper	6010
SS-22	2001	Sediment	West of Treated Wood Storage Area B (TWSB) in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel	Chromium	6010
								Acid Volatile Sulfide-SEM	68-03-3534
								pH	Field
								ORP	Field
								Salinity	ASTM D4542
								Grain Size	ASTM D422

**TABLE 4. SRI SAMPLE SUMMARY TABLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Sample Code	Date	Sample Media	Sample Location	Depth/Aquifer	Sample Method	Justification	Consultant	Parameter	Analytical Method
SS-23DF	2000	Sediment	Near Outfall of Greenfield Creek in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To determine presence or absence of contamination	Schnabel		
SS-24	2001	Sediment	Southwest of site in Cape Fear River	0 - 3"	Stainless Steel Spoon or Hand Auger	To confirm presence or absence of contamination	Schnabel		
SD-03	2001	Sediment	East of the site in the offsite ditch	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-05	2001	Sediment	Ditch south of Non-Treated Wood Storage Area A (NTA)	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-06DF	2000	Sediment	Ditch southeast of Non-Treated Wood Storage Area B (NTB)	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-07DF	2000	Sediment	Ditch west of Optimist Park	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-08	2001	Sediment	Greenfield Creek downstream of the confluence with ditch	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-09	2001	Sediment	Greenfield Creek downstream of SD-08	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-10	2001	Sediment	Near the Outfall of Greenfield Creek into Cape Fear River	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-11	2001	Sediment	In the Cape Fear River west of Large Storage Tank Area	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-13	2001	Sediment	Non-Treated Wood Storage Area B (NTB)	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-14	2001	Sediment	South of the Covered Ditch Area	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-15	2001	Sediment	South central portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-16	2001	Sediment	Southwestern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-17	2001	Sediment	Southwestern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-18	2001	Sediment	Southwestern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-18-Dup	2001	Sediment	Southwestern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-19	2001	Sediment	Southwestern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-20	2001	Sediment	Southwestern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-21	2001	Sediment	Drainage ditch east of site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-22	2001	Sediment	Drainage ditch east of site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-23	2001	Sediment	Drainage ditch in area NTB	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-24	2001	Sediment	Drainage ditch in area NTB	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-25	2001	Sediment	Drainage ditch in area NTB	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-26	2001	Sediment	Drainage ditch southern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-27	2001	Sediment	Drainage ditch southern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-28	2001	Sediment	Drainage ditch southern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-29	2001	Sediment	Drainage ditch southern portion of the site	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		

**TABLE 4. SRI SAMPLE SUMMARY TABLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Sample Code	Date	Sample Media	Sample Location	Depth/Aquifer	Sample Method	Justification	Consultant	Parameter	Analytical Method
SD-30	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-30-Dup	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-31	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-32	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-33	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-34	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-35	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-36	2001	Sediment	Wetland Area south of Covered Ditch	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-37	2001	Sediment	Wetland Area south of Covered Ditch	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-38	2001	Sediment	Wetland Area south of Covered Ditch	0 - 3"	Stainless Steel Spoon and Hand Auger	To determine presence or absence of contamination	Schnabel		
SD-39	2001	Sediment	Wetland Area east of Greenfield Lake	0 - 3"	Stainless Steel Spoon and Hand Auger	To establish background levels	Schnabel		
SD-40DF	2001	Sediment	Cape Fear River	0 - 3"	Stainless Steel Spoon and Hand Auger	To establish background levels	Schnabel		
SD-40DF-Dup	2001	Sediment	Cape Fear River	0 - 3"	Stainless Steel Spoon and Hand Auger	To establish background levels	Schnabel		
SD-41DF	2000	Sediment	Wetland Area northeast of site	0 - 3"	Stainless Steel Spoon and Hand Auger	To establish background levels	Schnabel		
SD-42-Comp	2001	Sediment Composite	Drainage ditch	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-43-Comp	2001	Sediment Composite	Drainage ditch	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-44-Comp	2001	Sediment Composite	Greenfield Creek	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-45-Comp	2001	Sediment Composite	Greenfield Creek	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-45-Comp-Dup	2001	Sediment Composite	Greenfield Creek	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-46-Comp	2001	Sediment Composite	Greenfield Creek	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-47-Comp	2001	Sediment Composite	Greenfield Creek	0-3"	Stainless Steel Hand Auger	Toxicity Testing	Schnabel		
SD-48	2001	Sediment	Greenfield Creek	0 - 3"	Stainless Steel Spoon and Hand Auger	To establish background levels	Schnabel		
MW-06	2001	Groundwater	North of Landfarm 1 and Landfarm 2	Shallow	Teflon Tubing or Polyethylene Bailers	To establish background levels upgradient of landfarm	Schnabel	2001	2001
MW-07	2001	Groundwater	West of Landfarm 1 and Landfarm 2	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel	Semi-Volatiles	8270C
MW-08	2001	Groundwater	Southwest of Landfarm 1 and Landfarm 2	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel	Volatiles	8260
MW-08-Dup	2001	Groundwater	Southwest of Landfarm 1 and Landfarm 2	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel	Arsenic	6010
MW-08A	2001	Groundwater	West of MW-08	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel	Chromium	6010
MW-09	2001	Groundwater	South of Landfarm 1 and Landfarm 2	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel	Copper	6010
								Dioxins/Furans	1613

**TABLE 4. SRI SAMPLE SUMMARY TABLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Sample Code	Date	Sample Media	Sample Location	Depth/Aquifer	Sample Method	Justification	Consultant	Parameter	Analytical Method
MW-10	2001	Groundwater	Production Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-11	2001	Groundwater	CCA & Creosote Treatment Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-11A	2001	Groundwater	Northwest of MW-11	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-11B	2001	Groundwater	Southwest of MW-11	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-12	2001	Groundwater	Production Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-13	2001	Groundwater	Production Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-14	2001	Groundwater	Covered Ditch Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-14A	2001	Groundwater	East of MW-14	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-15	2001	Groundwater	CCA Treatment Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-16	2001	Groundwater	Diesel Fuel Storage Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-17	2001	Groundwater	Diesel Fuel Storage Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-18	2001	Groundwater	North ditch area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-19	2001	Groundwater	Southern Treated Wood Storage Area A (TWSA)	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-19A	2001	Groundwater	East of MW-19	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-20	2001	Groundwater	Non-Treated Wood Storage Area B (NTB)	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-20A	2001	Groundwater	South of MW-20	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-21	2001	Groundwater	Non-Treated Wood Storage Area B (NTB)	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-22	2001	Groundwater	Large Storage Tank Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-22A	2001	Groundwater	East of MW-22	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-23	2001	Groundwater	Southern Treated Wood Storage Area A (TWSA)	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-24R	2001	Groundwater	South of Treated Wood Storage Area A (TWSA)	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-24A	2001	Groundwater	West of MW-24R	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-25	2001	Groundwater	South of Covered Ditch Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-26	2001	Groundwater	Covered Ditch Area	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-26A	2001	Groundwater	Covered Ditch Area	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-27	2001	Groundwater	Northeast corner of site along northern ditch	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-28	2001	Groundwater	West of railroad tracks along eastern ditch	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-28A	2001	Groundwater	Southeast of MW-28	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		

**TABLE 4. SRI SAMPLE SUMMARY TABLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Sample Code	Date	Sample Media	Sample Location	Depth/Aquifer	Sample Method	Justification	Consultant	Parameter	Analytical Method
MW-29	2001	Groundwater	Southeastern portion of site adjacent to Greenfield Creek	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-29A	2001	Groundwater	South of MW-29	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-30	2001	Groundwater	Northwest of MW-29	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-31	2001	Groundwater	Southwest corner of the site	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-32	2001	Groundwater	East of MW-31	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-33	2001	Groundwater	East of MW-32	Deep	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-34	2001	Groundwater	Southern boundary of the site	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-35	2001	Groundwater	South of MW-34	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-36	2001	Groundwater	Southwest of MW-35	Deep	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-36-Dup	2001	Groundwater	Southwest of MW-35	Deep	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-37	2001	Groundwater	South of Optimist Park	Shallow	Teflon Tubing or Polyethylene Bailers	To establish background levels	Schnabel		
MW-37-Dup	2001	Groundwater	South of Optimist Park	Shallow	Teflon Tubing or Polyethylene Bailers	To establish background levels	Schnabel		
MW-38	2001	Groundwater	North of MW-37	Intermediate	Teflon Tubing or Polyethylene Bailers	To establish background levels	Schnabel		
MW-39	2001	Groundwater	North of MW-38	Deep	Teflon Tubing or Polyethylene Bailers	To establish background levels	Schnabel		
MW-40	2001	Groundwater	Landfarm 1 & Landfarm 2	Shallow	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-41	2001	Groundwater	East of MW-40	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-42	2001	Groundwater	East of MW-41	Deep	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-43	2001	Groundwater	Large Storage Tank Area	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-44	2001	Groundwater	Covered Ditch Area	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-44A	2001	Groundwater	Covered Ditch Area	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
MW-45	2001	Groundwater	Creosote Treatment Area	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
ORW-1	2001	Groundwater	Creosote Treatment Area	Intermediate	Teflon Tubing or Polyethylene Bailers	To determine presence or absence of contamination	Schnabel		
BIO-10B	2001	Biological, Fish Tissue	Greenfield Lake	Sunfish	Electrofishing	To determine background concentration	Schnabel	2001 Semi-Volatiles	2001 8270C
BIO-10D	2001	Biological, Fish Tissue	Greenfield Lake	Largemouth Bass	Electrofishing	To determine background concentration	Schnabel	Arsenic	6010
BIO-10E	2001	Biological, Fish Tissue	Greenfield Lake	Bowfin	Electrofishing	To determine background concentration	Schnabel	Chromium	6010
BIO-11A	2001	Biological, Fish Tissue	Burnt Mill Creek	Largemouth Bass	Electrofishing	To determine background concentration	Schnabel	Copper	6010
BIO-11B	2001	Biological, Fish Tissue	Burnt Mill Creek	Stripped Mullet	Electrofishing	To determine background concentration	Schnabel	Total Lipids	OB/1090
BIO-11C	2001	Biological, Fish Tissue	Burnt Mill Creek	Sunfish	Electrofishing	To determine background concentration	Schnabel	Dioxins/Furans	1613

**TABLE 4. SRI SAMPLE SUMMARY TABLE
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Sample Code	Date	Sample Media	Sample Location	Depth/Aquifer	Sample Method	Justification	Consultant	Parameter	Analytical Method
BIO-11C-Dup	2001	Biological, Fish Tissue	Burnt Mill Creek	Sunfish	Electrofishing	To determine background concentration	Schnabel		
BIO-12A	2001	Biological, Fish Tissue	Upper Greenfield Creek	Sunfish	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-12B	2001	Biological, Fish Tissue	Upper Greenfield Creek	Stripped Mullet	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13A	2001	Biological, Fish Tissue	Lower Greenfield Creek	Bowfin	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13B	2001	Biological, Fish Tissue	Lower Greenfield Creek	Gizzard Shad	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13B-Dup	2001	Biological, Fish Tissue	Lower Greenfield Creek	Gizzard Shad	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13C	2001	Biological, Fish Tissue	Lower Greenfield Creek	Largemouth Bass	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13D	2001	Biological, Fish Tissue	Lower Greenfield Creek	Sunfish	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13E	2001	Biological, Fish Tissue	Lower Greenfield Creek	Stripped Mullet	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-13E-Dup	2001	Biological, Fish Tissue	Lower Greenfield Creek	Stripped Mullet	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-14-Comp	2001	Biological, Fish Tissue	Lower Greenfield Creek	Small Fish	Electrofishing	To determine presence or absence of contamination	Schnabel		
BIO-15-Comp	2001	Biological, Fish Tissue	Burnt Mill Creek	Small Fish	Electrofishing	To determine background concentration	Schnabel		
BIO-15-Comp-Dup	2001	Biological, Fish Tissue	Burnt Mill Creek	Small Fish	Electrofishing	To determine background concentration	Schnabel		
BIO-16-Comp	2001	Biological, Fish Tissue	Upper Greenfield Creek	Small Fish	Electrofishing	To determine presence or absence of contamination	Schnabel		

TABLE 5-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present in GW	¹ SWP-1 4/30/82	¹ SWP-3 4/30/82	¹ NCDDR-1 4/30/82	¹ NCDDR-3 4/30/82	² Area A 6/83-6/83	² Area B-1 6/83-6/83	² Area B-2 6/83-6/83	² Area B-3 6/83-6/83	² Area B-4 6/83-6/83	² Area B-5 6/83-6/83	² Area B-6 6/83-6/83	² Area B-7 6/83-6/83	² Area C-1 6/83-6/83	² Area C-2 6/83-6/83	
1-Methylnaphthalene	?			0.062**	0.29**	110**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dimethylbenzol	N	ND	2400				2.6	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	N	ND	460	10800				NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	N	ND	12.6	4.8			0.002	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	0.120J	11.2	38			0.56	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	N	ND	740	760			1.6	YES	450	50	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	?	ND	450**	10,800**				NO	ND	ND	300	16	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000			42	YES	190	ND	1000+	200	-	-	-	-	-	-	-	-	-	-	-
Anthracenedione	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzacephenanthrylene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzanthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluoranthene	C	0.110J	0.62	2.9	47		0.001	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluorene	C	0.140J	0.062	0.29	5		0.00094	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Naphthoquinone	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	C	0.260J	0.62	2.9	47		0.00094	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	?	0.180J	460**	10,800**			4.2	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)Fluoranthene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)Fluoranthene	C		6.2	29	475		0.0094	YES	ND	ND	300	90	-	-	-	-	-	-	-	-	-	-	-
Benzoanthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoanthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoanthracene (2 isomers)	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluorene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoic Acid	N		20000	20000			560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?			</																			

TABLE 5-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present in GW	Area D-1 6/83-8/83	Area D-2 6/83-8/83	Area D-3 6/83-8/83	Area E 6/83-8/83	Area F 6/83-8/83	Area G-1 6/83-8/83	Area G-2 6/83-8/83	Area G-3 6/83-8/83	JA-C1 1/7/85	LA-C2 1/7/85	LB-C3 1/7/85	LC-C4 1/7/85	LF1AU 10/16/90	LF1BU 10/16/90	
1-Methylanthracene	?		ND	0.052**	0.29**	110**		YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	N		ND	2400	450		2.8	NO	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	N		ND	10800				NO	-	-	-	-	-	-	-	-	0.400J	0.500J	0.400J	ND	-	-	-
2-Chlorophenol	N		ND	12.6	48		0.002	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-
2-Methylanthracene	N		0.120J	11.2	38		0.56	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	16	4.0J	5.9J
Acenaphthene	N		ND	740	7600		1.6	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	170	ND	ND
Acenaphthylene	?		ND	450**	10,800**			NO	-	-	-	-	-	-	-	-	ND	1.5	1.0J	5.3	ND	ND	ND
Anthracene	N		ND	4400	20000		4.2	YES	-	-	-	-	-	-	-	-	2.0J	5.2	2.0J	170	68	230	-
Anthracenedione	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzacephenanthrylene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzanthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	C		0.110J	0.62	2.9	47	0.001	YES	-	-	-	-	-	-	-	-	2.7	11	3.9	138	-	-	-
Benz(a)pyrene	C		0.140J	0.062	0.29	5	0.00094	YES	-	-	-	-	-	-	-	-	4.6	11	5.8	37	28	19	-
Benz(b)fluoranthene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	40JN	-	-
Benz(b)fluoranthene	C			0.62	2.9	47	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(b)fluoranthene	C		0.260J	0.62	2.9	47	0.00094	YES	-	-	-	-	-	-	-	-	5.6	14	7.3	48	-	-	-
Benz(b)fluoranthene	?							-	-	-	-	-	-	-	-	-	4JN	-	-	-	-	-	-
Benz(c)fluoranthene	?		0.180J	460**	10,800**		4.2	YES	-	-	-	-	-	-	-	-	ND	ND	ND	9	19	20	-
Benz(c)fluoranthene	?							-	-	-	-	-	-	-	-	-	3JN	6JN	4JN	40JN	-	-	-
Benz(k)fluoranthene	C			5.2	29	475	0.0094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluoranthene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluoranthene (2 isomers)	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluorene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoic Acid	N			20000	20000		560	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	-	-
Benzonaphthothiophene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzopyrene (not a)	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bohrene	N			350	350			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
But(2-ethylhexyl)phthalate	C		ND	35	180		0.06	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	8.5	7.4
Butyl Benzyl Phthalate	N			2400	20000		2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C		ND	24	120	1,729	0.068**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	26	46
Carboxylic Acid	?		0.100JN					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C		0.150J	62	290	4,753	0.1	YES	-	-	-	-	-	-	-	-	ND	ND	7.1	120	22	-	27
Cresol (ortho)	N		ND	620	8800		18**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N		ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclopentaphenanthrene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	70JN	-	-
Dibenz(a,h)anthracene	?			0.062	0.29	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	C			0.062	0.29	5	0.00094	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	-	-
Dibenzofuran	N		0.046J	58	1020		0.56	YES	-	-	-	-	-	-	-	-	0.300J	0.900J	0.300J	110	5.0J	6.7J	-
Dihydroanthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	8JN	-	-
Dimethylnaphthalene	?		0.090JN					-	-	-	-	-	-	-	-	-	-	-	-	-	50JN	-	-
Dimethylphenanthrene (2 isomers)	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyltetrahydropyran-2-one	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-N-Butylphthalate	N		0.100J	1220	17,600		14	YES	-	-	-	-	-	-	-	-	ND	ND	ND	6.5	-	-	-
Ethylene glycol	N			20000	20000		140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneindene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	10JN	-	-
Fluoranthene	N		0.150J	480	6000		6.6	YES	-	-	-	-	-	-	-	-	15	25	10	29	58	19	-
Fluorene	N		ND	520	6600		6.6	YES	-	-	-	-	-	-	-	-	ND	ND	ND	170	14	4.9J	-
Fluorone	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene (HCB)	C		ND	0.3	1.5		0.0004	NO	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	-	-
Indeno(1,2,3-Cd)Pyrene	C		0.140J	0.62	29	47	0.0094	YES	-	-	-	-	-	-	-	-	ND	ND	ND	10J	-	-	-
Methylantracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylantracene (2 isomers)	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzanthracene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran	?							-	-	-	-	-	-	-	-	-	-	-	-	-	40JN	-	-
Methylfluorene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	20JN	-	-
Methylnaphthalene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylpyrene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylpyrene (2 isomers)	?							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	N		0.085J	11.2	38	23,055	0.42	YES	81	420	0.2	-	-	-	-	ND	ND	1.2	ND	ND	3.8J	4.4J	-
Pentachlorophenol	C			3	11	59	0.008	YES	13	3.4	0.17	-	-	-	50	0.24	0.32	ND	4.0J	ND	150	ND	ND
Perylene	?		0.100JN					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	?		0.140J	450**	10,800**		4.2	YES	3,000	10,000	4.6	-	-	-	-	-	-	-	-	-	-	-	-
Phenylsulfathiazole	N							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N		0.180J	460	10800		4.2	YES	-	-	-	-	-	-	-	-	12	22	10J	220	44	50	-
Tetrachlorophenols	N			360	5200		4.2	YES	7.9	1.2	0.022	-	-	-	-	1.9	0.012	0.058	-	-	-	-	-
Triethylnaphthalenes	?							-	-	-	-	-	-	-	-	-	-	-	-	-	20JN	-	-
Xanthene	?							-	-	-	-	-	-	-	-	-	-	-	-	-	20JN	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs)
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 * Background Location
 ** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
 *** GW standard based on Region 9 Tap Water Concentration
 Res = Residential
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 S-Spec. = Site Specific
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TABLE 5-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present in GW	LF2BUS 10/15/01	LF2CUS 10/15/01	LF2DUS 10/15/01	LF2EUS 10/15/01	LF2A 2/15/96	LF1A 2/15/96	NTA-1 2/26/91	NTA-2 2/26/91	NTA-3 2/26/91	NTA-4 2/26/91	NTA-5 2/26/91	NTA-6 2/26/91	NTA-7 2/26/91	NTA-8 2/26/91	NTA-9 2/26/91	
Extractable Organics	N																						
1-Methylnaphthalene	?		0.062**	0.29**	110**			0.59J	0.46J	0.25J	0.26J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	N	ND	2400					ND	0.087J	ND	0.087J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	N	ND	450	10800		2.8	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	N	ND	12.6	48		0.002	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	N	0.120J	11.2	38		0.56	YES	16J	4.6J	4.4J	5.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	N	ND	740	7600		1.8	YES	2.5J	5.5J	1.3J	1.0J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	?	ND	450**	10,800**				5.0J	4.7J	3.7J	3.5J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	N	ND	4400	20000				310	120	75	64	10	5.7	0.77	ND	0.79	ND	0.36	0.55	1.1	0.95	ND	ND
Anthracenedione	?																						
Benzo(a)anthracene	?																						
Benzo(b)anthracene	?																						
Benzo(k)anthracene	?																						
Benzo(a)pyrene	C	0.110J	0.62	2.9	47	0.001	YES	25	17	8.6	11	7.0	6.9	1.2	1.6	1.1	ND	0.57	0.47	0.07	1.5	ND	ND
Benzo(a)pyrene	C	0.140J	0.062	0.29	5	0.00094	YES	23	26	12	12	9.2	8.1	1.0	1.1	1.0	ND	0.41	ND	0.77	1.3	ND	ND
Benzo(b)fluoranthene	?																						
Benzo(b)fluoranthene	C		0.62	2.9	47	0.0094	YES					15	14										
Benzo(k)fluoranthene	C	0.260J	0.62	2.9	47	0.0094	YES	55	37	26	30	21	20	4.1	5.9	4.1	0.80	2.2	ND	1.7	2.9	ND	ND
Benzo(ghi)perylene	?																						
Benzo(ghi)perylene	?	0.180J	450**	10,800**				10J	6.0J	7.0J	5.1	6.2	4.4										
Benzo(i)fluoranthene	?																						
Benzo(k)fluoranthene	C		5.2	29	475	0.094	YES					5.7	5.5										
Benzoanthracene	?																						
Benzoanthracene (2 isomers)	?																						
Benzo(a)fluorene	?																						
Benzoic Acid	N		20000	20000		560																	
Benzo(a)anthracene	?																						
Benzo(a)pyrene (not a)	?																						
Biphenyl	N		350	350			NO	2.1J	0.91J	0.64J	0.66J	ND	ND										
Bis(2-ethylhexyl)phthalate	C	ND	35	180		0.08	YES																
Butyl Benzyl Phthalate	N		2400	20000		2																	
Carbazole	C	ND	24	120	1,729	0.058**	YES	170	60	34	37	2.2	ND	ND	0.64	0.49	ND	ND	ND	ND	1.1	1.0	ND
Carboxylic Acid	?	0.700J/N																					
Chrysene	C	0.150J	62	290	4,753	0.1	YES	31	20	11	12	8.0	6.7	1.7	2.7	1.7	ND	0.93	0.63	1.6	1.7	ND	ND
Cresol (ortho)	N	ND	620	8800		1.8**	YES	ND	0.028J	ND	0.022J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cresol m & p	N	ND	62	880		0.070	YES	ND	ND	ND	0.087J	ND	ND										
Cyclopentaphenanthrene	?																						
Dibenz(a,h)anthracene	?		0.062	0.29	5			3.4J	3.4J	2.0J	2.5J												
Dibenz(a,h)anthracene	C		0.062	0.29	5	0.00094	YES							ND	ND								
Dibenzofuran	N	0.046J	58	1020		0.56	YES	20	8.4	5.0J	5.1	ND	ND										
Dihydroanthrothran	?																						
Dimethylnaphthalene	?	0.090J/N																					
Dimethylphenanthrene (2 isomers)	?																						
Dimethyltetrahydropyran-2-one	?																						
Di-N-Butylphthalate	N	0.100J	1220	17,800		14	YES																
Ethyleneglycol	N		20000	20000		140																	
Ethyleneindene	?																						
Fluoranthene	N	0.180J	450	8000		5.6	YES	78	37	19	20	11	10	2.5	4.0	2.4	0.52	1.5	1.3	1.7	2.0	ND	ND
Fluorene	N	ND	520	6600		5.6	YES	62	26	14	13	ND	ND										
Fluorenone	?																						
Hexachlorobenzene (HCB)	C	ND	0.3	1.5		0.0004	NO																
Indeno(1,2,3-Cd)Pyrene	C	0.140J	0.62	2.9	47	0.0094	YES	13J	9.1	8.8	7.3	7.4	5.1	0.68	0.66	0.85	ND	ND	ND	ND	0.58	ND	ND
Methylanthracene	?																						
Methylanthracene (2 isomers)	?																						
Methylbenzanthracene	?																						
Methylbenzofuran	?																						
Methylfluorene	?																						
Methylnaphthalene	?																						
Methylphenanthrene	?																						
Methylpyrene	?																						
Methylpyrene (2 isomers)	?																						
Naphthalene	N	0.085J	11.2	38	23,085	0.42	YES	11J	4.3J	3.4J	3.5J	ND	ND	ND	ND	0.66	ND	ND	ND	0.99	ND	ND	ND
Pentachlorophenol	C		3	11	59	0.006	YES	ND	4.6J	6.4J	4.1J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?	0.100J/N																					
Phenanthrene	?	0.140J	450**	10,800**		4.2	YES	87	38	20	21	4.2	2.0	0.82	ND	1.0	ND	0.42	0.44	1.1	0.47	ND	ND
Phenylnaphthalene	?																						
Pyrene	N	0.180J	450	10800		4.2	YES	64	35	17	19												
Tetrachlorophenols	N		360	5200		4.2	YES	ND	ND	0.34J	0.47J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trimethylnaphthalene	?																						
Xanthene	?																						

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs)
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 * Background Location
 ** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
 *** GW standard based on Region 9 Tap Water Concentration
 Res = Residential
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TABLE 5-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWSB2A 2/14/96	TWSB3A 2/14/96	TWSB4A 2/14/96	TWSB5A 2/14/96	TWSB6A 2/14/96	TWSB7A 2/14/96	TWSB8A 2/14/96	TWSB8A 2/14/96	TWSB10A 2/14/96	TWSB11A 2/14/96	TWSB12A 2/14/96	TWSB13A 2/14/96	TWSB14A 2/14/96	TWSB15A 2/14/96	
Extractable Organics	?																					
1-Methylnaphthalene	?		0.062**	0.29**	110**																	
2,4-Dimethylphenol	N	ND	2400																			
2-Chloronaphthalene	N	ND	450	10800		2.8	YES	ND	ND	ND	ND	ND	ND									
2-Chlorophenol	N	ND	12.8	48		0.002	YES	ND	ND	ND	ND	ND	ND									
2-Methylnaphthalene	N	0.120J	11.2	38		0.56	YES	ND	ND	ND	ND	ND	ND									
Acenaphthene	N	ND	740	7600		1.6	YES	ND	ND	ND	ND	ND	ND									
Acenaphthylene	?	ND	450**	10,800**																		
Anthracene	N	ND	4400	20000		42	YES	ND	ND	ND	15	ND	ND	ND	0.45	ND	ND	ND	ND	ND	2.2	
Anthracenedione	?																					
Benzo(a)anthracene	?																					
Benzo(a)fluoranthene	?																					
Benzo(a)pyrene	C	0.110J	0.62	2.9	47	0.001	YES	0.50	ND	4.8	59	2.7	0.64	0.85	ND	0.90	2.4	ND	10	2.4	7.7	
Benzo(b)fluoranthene	C	0.140J	0.062	0.29	5	0.00094	YES	0.45	ND	11	28	2.0	0.36	0.52	ND	0.54	1.3	ND	8.8	1.8	5.5	
Benzo(b)kaphanthrene	?																					
Benzo(b)fluoranthene	C		0.62	2.9	47	0.00094	YES	1.1	ND	22	60	5.6	1.4	1.5	0.58	2.3	3.9	0.66	20	7	13	
Benzo(b)kaphanthrene	C	0.280J	0.62	2.9	47	0.00094	YES															
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene	?																					
Benzo(k)perylene	?	0.180J	450**	10,800**																		
Benzo(k)fluoranthene	C																					
Benzo(k)fluoranthene	C		5.2	29	475	0.0094	YES	0.40	ND	7.1	30	1.9	0.55	0.61	ND	1.0	1.6	ND	10	2.5	5.9	
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene (2 isomers)	?																					
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene	N		20000	20000		560																
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene	?																					
Benzo(k)fluoranthene (not a)	?																					
Benzo(k)fluoranthene	N		350	350			NO															
Benzo(k)fluoranthene	C	ND	35	180		0.06	YES															
Bis(2-ethylhexyl)phthalate	N		2400	20000		2																
Bis(2-ethylhexyl)phthalate	C	ND	24	120	1,729	0.068**	YES	ND	0.37	ND	ND	ND	ND	ND	ND							
Carbazole	C	ND	24	120	1,729	0.068**	YES	ND	0.37	ND	ND	ND	ND	ND	ND							
Carboxylic Acid	?	0.700JN																				
Chrysene	C	0.150J	62	250	4,753	0.1	YES	0.88	ND	6.3	68	4.7	1.5	1.4	0.43	2.0	3.7	0.54	17	5.2	9.8	
Creosol (ortho)	N	ND	620	8800		1.6**	YES															
Creosol m & p	N	ND	62	880		0.070	YES															
Cyclopentaphenanthrene	?																					
DBenzo(a)anthracene	?		0.062	0.29	5																	
DBenzo(a,h)anthracene	C		0.062	0.29	5	0.00094	YES	ND	ND	ND	ND	ND	ND									
Dibenzofuran	N	0.046J	58	1020		0.56	YES															
Dihydroanthracene	?																					
Dimethylnaphthalene	?	0.090JN																				
Dimethylphenanthrene (2 isomers)	?																					
Dimethyltetrahydropyran-2-one	?																					
Di-N-Butylphthalate	N	0.100J	1220	17,800		14	YES															
Ethylene glycol	N		20000	20000		140																
Ethylendindene	?																					
Fluoranthene	N	0.180J	450	8000		5.6	YES	0.88	ND	6.1	85	4.6	3.3	2.2	0.58	3.6	6.8	0.53	17	8.8	12	
Fluorene	N	ND	520	6600		5.6	YES															
Fluorenone	?																					
Hexachlorobenzene (HCB)	C	ND	0.3	1.5		0.0004	NO															
Indeno(1,2,3-Cd)Pyrene	C	0.140J	0.62	2.9	47	0.0094	YES	ND	ND	6.4	10	1.5	ND	ND	ND	0.40	0.92	ND	6.2	ND	3.1	
Methylantracene	?																					
Methylantracene (2 isomers)	?																					
Methylbenzanthracene	?																					
Methylbenzofuran	?																					
Methylfluorene	?																					
Methylnaphthalene	?																					
Methylphenanthrene	?																					
Methylpyrene	?																					
Methylpyrene (2 isomers)	?																					
Naphthalene	N	0.085J	11.2	38	23,063	0.42	YES	ND	ND	ND	ND	ND	ND									
Pentachlorophenol	C		3	11	59	0.006	YES	ND	ND	ND	ND	ND	ND									
Perylene	?	0.100JN																				
Phenanthrene	?	0.140J	450**	10,800**		4.2	YES	ND	ND	ND	ND	0.73	0.71	ND	ND	0.53	ND	ND	ND	ND	2.5	
Phenylnaphthalene	?																					
Pyrene	N	0.180J	450	10800		4.2	YES															
Tetrachlorophenols	N		350	5200		4.2	YES	ND	ND	ND	ND	ND	ND									
Trimethylnaphthalene	?																					
Xanthene	?																					

Notes:
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Cancer Risk = 1E-06 and Chronic HQ = 0.2
J = Estimated Value
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* Background Location
** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
*** GW standard based on Region 9 Tap Water Concentration

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SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWSB15ADUP 2/14/98	PDA1A 2/14/98	PDA2A 2/14/98	PDA3A 2/14/98	PDA4A 2/14/98	PDA5A 2/14/98	PDA6A 2/14/98	PDA7A 2/14/98	PDA8A 2/14/98	PDA9A 2/14/98	PDA10A 2/14/98	PDA11A 2/14/98	SS-41 10/14/98	SS-42* 10/14/98	SS-43* 10/14/98	
1-Methylnaphthalene	?		0.062**	0.29**	110**																		
2,4-Dimethylnaphthalene	N	ND	2400																				
2-Chloronaphthalene	N	ND	460	10800		2.8	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	N	ND	12.8	48		0.002	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	N	0.120J	11.2	38		0.56	YES															0.120J	ND
Acenaphthene	N	ND	740	7600		1.8	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.45	ND	ND	ND	ND	ND	ND
Acenaphthylene	?	ND	460**	10,800**				ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38	ND	ND	ND	ND	ND	ND
Anthracene	N	ND	4400	20000		42	YES	ND	ND	1.1	ND	ND	3.6	2.6	ND	21	4.5	ND	ND	ND	ND	ND	ND
Anthracenedione	?																						
Benzo(a)anthracene	?																						
Benzo(a)anthracene	?																						
Benzo(a)anthracene	C	0.110J	0.62	2.9	47	0.001	YES	4.2	6.6	0.53	0.71	ND	1.8	3.7	1.1	8.1	1.4	ND	ND	ND	ND	0.110J	
Benzo(a)pyrene	C	0.140J	0.062	0.29	5	0.00094	YES	3.8	5.3	0.58	0.90	ND	1.5	3.1	0.67	7.3	1.9	ND	ND	0.150J	0.087J	0.140J	
Benzo(b)fluoranthene	?																						
Benzo(b)fluoranthene	C		0.52	2.9	47	0.00094	YES	8.4	15	1.7	2.4	1.1	6.2	10	1.7	17	3.7	ND	ND	0.220J			
Benzo(b)fluoranthene	C	0.260J	0.62	2.9	47	0.00094	YES														0.220J	0.150J	0.260J
Benzo(b)fluoranthene	?																						
Benzo(b)fluoranthene	?	0.180J	460**	10,800**				4.2													0.110J	0.056J	0.180J
Benzo(k)fluoranthene	?																						
Benzo(k)fluoranthene	C		6.2	29	475	0.0094	YES	3.4	6.0	0.49	0.88	ND	2.0	3.9	0.67	6.3	1.6	ND	ND	0.220J			
Benzoanthracene	?																						
Benzoanthracene (2 isomers)	?																						
Benzo(a)fluorene	?																						
Benzoic Acid	N		20000	20000		560																	
Benzo(a)anthracene	?																						
Benzo(a)anthracene (not a)	?																						
Biphenyl	N		350	350			NO																
Butyl(2-ethylhexyl)phthalate	C	ND	35	180		0.08	YES														ND	ND	ND
Butyl Benzyl Phthalate	N		2400	20000		2																	
Carbazole	C	ND	24	120	1,729	0.068**	YES	ND	ND	ND	ND	ND	0.44	ND	ND	7.8	0.56	ND	ND	ND	ND	ND	ND
Carboxylic Acid	?	0.700JN																					
Chrysene	C	0.150J	62	290	4,753	0.1	YES	8.4	11	0.91	1.4	ND	3.0	7.2	1.3	12	2.0	ND	ND	0.220J	0.160J	0.700JN	
Creosol (ortho)	N	ND	620	8800		1.8**	YES																
Creosol m & p	N	ND	62	880		0.070	YES																
Cyclopentaphenanthrene	?																						
Dibenz(a,h)anthracene	?		0.062	0.29	5																		
Dibenz(a,h)anthracene	C		0.062	0.29	5	0.00094	YES	ND	ND	ND	ND	ND	0.51	ND	ND	ND	0.39	ND	ND				
Dibenzofuran	N	0.046J	58	1020		0.56	YES														ND	0.046J	ND
Dihydronaphthofuran	?																						
Dimethylnaphthalene	?	0.090JN																					
Dimethylphenanthrene (2 isomers)	?																						
Dimethyltetrahydropyran-2-one	?																						
Di-N-Butylphthalate	N	0.100J	1220	17,800		14	YES														ND	0.100J	ND
Ethylene glycol	N		20000	20000		140																	
Ethyleneindene	?																						
Fluoranthene	N	0.180J	460	8000		5.6	YES	8.8	13	1.1	1.5	0.90	1.7	9.4	1.9	14	3.0	ND	ND	0.250J	ND	0.180J	
Fluorene	N	ND	520	6600		5.6	YES														ND	ND	ND
Fluorenone	?																						
Hexachlorobenzene (HCB)	C	ND	0.3	1.8		0.0004	NO														ND	ND	ND
Indeno(1,2,3-Cd)Pyrene	C	0.140J	0.62	2.9	47	0.0094	YES	2.0	ND	0.63	0.57	ND	1.7	2.9	0.46	5.0	2.0	ND	ND	0.110J	0.063J	0.140J	
Methylantracene	?																						
Methylantracene (2 isomers)	?																						
Methylbenzanthracene	?																						
Methylbenzofuran	?																						
Methylfluorene	?																						
Methylnaphthalene	?																						
Methylphenanthrene	?																						
Methylpyrene	?																						
Methylpyrene (2 isomers)	?																					0.100JN	
Naphthalene	N	0.085J	11.2	38	23,065	0.42	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.92	ND	ND	ND	0.085J	0.082J	
Pentachlorophenol	C		3	11	59	0.006	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?	0.100JN																				0.200JN	0.100JN
Phenanthrene	?	0.140J	460**	10,800**		4.2	YES	ND	ND	ND	ND	ND	0.50	2.7	ND	6.7	1.5	ND	ND	ND	0.140J	0.072J	
Phenylanthracene	?																						
Pyrene	N	0.180J	460	10800		4.2	YES														0.220J	0.096J	0.180J
Tetrachlorophenols	N		360	5200		4.2	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Trimethylnaphthalene	?																						
Xanthene	?																						

Notes:
USEPA Region 9 Preliminary Remediation Goals (PRGs). Res = Residential
Cancer Risk = 1E-06 and Chronic HQ = 0.2 Ind = Industrial
J = Estimated Value S-Spec. = Site Specific
C = Carcinogen Prot. = Protection of groundwater
N = Non-carcinogen - = Not Analyzed
* Background Location ND = Not Detected
** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
*** GW standard based on Region 9 Tap Water Concentration

TABLE 5-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	SS-04 10/4/96	SS-05 10/4/96	SS-06 10/4/96	SS-07 10/4/96	SS-08 10/4/96	SS-09 10/4/96	SS-10 10/4/96	SS-11 10/4/96	SS-12 10/4/96	SS-13 10/4/96	SS-14 10/4/96	SS-15 10/4/96	SS-16 10/4/96	SS-17 10/4/96	SS-18 10/4/96	SS-19 10/4/96		
Extractable Organics	?		0.062**	0.29**	110**																				
1,4-Dimethylphenol	N	ND	2400			2.8	YES	ND	0.070J	ND	ND	ND	ND	ND	ND										
2,4-Dimethylphenol	N	ND	460	10800			NO																		
2-Chloronaphthalene	N	ND	12.6	48		0.002	YES	ND	0.039J	ND	ND	ND	ND	ND	ND	ND									
2-Methylnaphthalene	N	0.120J	11.2	36		0.56	YES	ND	ND	ND	0.470J	0.360J	ND	0.230J	ND	0.066J	ND	ND	ND	ND	0.420J	ND	ND	ND	ND
Acenaphthene	N	ND	740	7600		1.8	YES	ND	ND	0.110J	ND	0.300J	ND	ND	ND	0.053J	0.033J	0.510	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	?	ND	460**	10,800**			NO	ND	0.036J	0.160J	0.470J	0.160J	ND	0.190J	ND	ND	0.130J	11	ND	ND	0.360J	ND	ND	ND	
Anthracene	N	ND	4400	20000		4.2	YES	0.050J	0.220J	2.2	0.800J	0.670	0.220J	0.610J	ND	0.120J	33	ND	ND	ND	0.670J	ND	ND	ND	
Anthracenedione	?							0.300JN			0.600JN	1JN									0.700JN				
Benzacephenanthrylene	?										4JN														
Benzanthracene	?											0.800JN		0.100JN											
Benz(a)anthracene	C	0.110J	0.62	2.9	47	0.001	YES	ND	0.740	2.7J	4.2	1.5	0.170J	1.8	ND	0.200J	0.190J	21J	ND	ND	3.7	0.350J	0.200J	0.200J	
Benzo(a)pyrene	C	0.140J	0.062	0.29	6	0.000094	YES	0.110J	0.140J	1.4J	5.3	1.0	0.180J	1.3	ND	0.130J	0.310J	29J	ND	ND	4.7	0.340J	0.250J	0.250J	
Benzo(b)fluoranthene	?																								
Benzo(b)fluoranthene	C	0.62	2.9	47	0.00094	YES																			
Benzo(b)fluoranthene	C	0.260J	0.62	2.9	47	0.00094	YES	0.300J	1.8	2.8J	13	8.2	0.630J	6.5	ND	0.460J	0.780J	34J	ND	ND	12	0.330J	0.280J	0.280J	
Benzo(g)fluoranthene	?	0.180J	460**	10,800**																					
Benzo(ghi)perylene	?	0.180J	460**	10,800**				0.079J	0.260J	0.910J	5.1	1.9	0.200J	1.3	ND	0.200J	0.580	17J	ND	ND	4.6	0.250J	0.160J	0.160J	
Benzo(k)fluoranthene	?																								
Benzofluoranthene	?		6.2	29	475	0.0094	YES																		
Benzofluoranthene	?																								
Benzofluoranthene (2 isomers)	?								0.300JN													0.500JN			
Benzofluorene	?																								
Benzofluorene	?																								
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**TABLE 5-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	JA-C1	LA-C2	LB-C3	LC-C4	TWSB1A	TWSB2A	TWSB3A	TWSB4A
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	1/7/85	1/7/85	1/7/85	1/7/85	2/14/96	2/14/96	2/14/96	2/14/96
M/P-Xylene	N	-	280	280		10.6	YES	-	-	-	-	ND	ND	ND	ND
Pinene	?	-					NO	-	-	-	0.007JN	-	-	-	-
Trichlorofluoromethane	N	-	78	400		42	NO	-	0.010JN	0.010JN	-	ND	ND	ND	ND
Trimethylcyclohexanone	?	-					NO	-	-	-	0.006JN	-	-	-	-

Parameters (mg/L)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWSB5A	TWSB6A	TWSB7A	TWSB8A	TWSB9A	TWSB10A	TWSB11A	TWSB12A
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96
M/P-Xylene	N	-	280	280		10.6	YES	ND	ND	ND	ND	0.0065	ND	ND	ND
Pinene	?	-					NO	-	-	-	-	-	-	-	-
Trichlorofluoromethane	N	-	78	400		42	NO	ND							
Trimethylcyclohexanone	?	-					NO	-	-	-	-	-	-	-	-

Parameters (mg/L)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWSB13A	TWSB14A	TWSB15A	TWSB15ADUP	PDA1A	PDA2A	PDA3A	PDA4A
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96
M/P-Xylene	N	-	280	280		10.6	YES	ND	ND	ND	ND	ND	ND	ND	ND
Pinene	?	-					NO	-	-	-	-	-	-	-	-
Trichlorofluoromethane	N	-	78	400		42	NO	ND	ND	ND	ND	ND	ND	ND	ND
Trimethylcyclohexanone	?	-					NO	-	-	-	-	-	-	-	-

Parameters (mg/L)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	PDA5A	PDA6A	PDA7A	PDA8A	PDA9A	PDA10A	PDA11A
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96
M/P-Xylene	N	-	280	280		10.6	YES	ND	ND	ND	0.0086	ND	0.011	ND
Pinene	?	-					NO	-	-	-	-	-	-	-
Trichlorofluoromethane	N	-	78	400		42	NO	ND						
Trimethylcyclohexanone	?	-					NO	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

[Exceeds Highest PRG.]

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence for Presence of Material.

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	¹ Area B-1 6/83-9/83	¹ Area B-2 6/83-9/83	¹ Area B-3 6/83-9/83	¹ Area B-4 6/83-9/83	¹ Area B-5 6/83-9/83	¹ Area B-6 6/83-9/83	¹ Area B-7 6/83-9/83	¹ Area B-8 6/83-9/83	¹ Area B-9 6/83-9/83	¹ Area B-1 6/83-9/83	¹ Area B-2 6/83-9/83
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	30	421	576	299	496	552	150	40	266	150	130
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	22	13	53	238	1306	123	181	3	48	56.1	32.7
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		20.0	YES	19	123	251	77	216	211	293	82	59	-	-
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		1.78	YES	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG. []
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material.
¹ Area A - Treating Area
¹ Area B - CCA Area
¹ Area C - Creo-Penta Track Area
¹ Area D - Old Ditch Area
¹ Area E - Bulk Storage Area (Creosote Storage Area Only)
¹ Area F - Banding House Area
¹ Area G - Product Storage Area
² #1 - Road in Front of Old #5 Pole Machine
² #2 - Road in Front of Old #5 Pole Machine
² #3 - Road Crossing Separating State Ports & City
² #4 - Road Crossing Separating State Ports & City

J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	¹ Area B-3	¹ Area F-1	¹ Area F-2	¹ Area F-3	¹ Area F-4	¹ Area F-5	¹ Area F-6	¹ Area F-7	JA-C1	LA-C2	LB-C3	LC-C4	LF1AU
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	6/83-9/83	6/83-9/83	6/83-9/83	6/83-9/83	6/83-9/83	6/83-9/83	6/83-9/83	6/83-9/83	1/7/85	1/7/85	1/7/85	1/7/85	10/10/90
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	2,600	4,300	2,100	1,700	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Arsenic	C	56J	0.39	2.7	4	1	YES	32	2.2	4.5	0.1	0.018	0.2	0.8	0.75	10	610	10	20	-
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	4,000	12,000	6,300	2,000	-
Chromium	C	10.9	30	64	1,406	1	YES	1.76	-	-	-	-	-	-	-	ND	390	ND	10	-
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Copper	N	24	580	15,200		20.0	YES	-	-	-	-	-	-	-	-	40	620	30	60	-
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	0.88	0.41	0.11	ND	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	4,800	12,000	5,800	6,600	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	12	150	33	61	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Manganese	N	65	360	6,400		1.76	YES	-	-	-	-	-	-	-	-	40	100	52	50	-
Mercury	N	ND	4.8	122		0.022	YES	-	-	-	-	-	-	-	-	ND	0.48	ND	0.45	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	ND	20	ND	ND	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	ND	75	20	87	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG: _____

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

¹ Area A - Treating Area

¹ Area B - CCA Area

¹ Area C - Creo-Penta Track Area

¹ Area D - Old Ditch Area

¹ Area E - Bulk Storage Area (Creosote Storage Area Only)

¹ Area F - Banding House Area

¹ Area G - Product Storage Area

² #1 - Road in Front of Old #5 Pole Machine

² #2 - Road in Front of Old #5 Pole Machine

² #3 - Road Crossing Separating State Ports & City

² #4 - Road Crossing Separating State Ports & City

J = Estimated Value
C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	LF1BU 10/10/90	LF1CU 10/10/90	LF1DU 10/10/90	LF1EU 10/10/90	LF2AU 10/10/90	LF2BU 10/10/90	LF2CU 10/10/90	LF2DU 10/10/90	LF2EU 10/10/90	LF1AUS 10/15/91	LF1BUS 10/15/91	LF1CUS 10/15/91	LF1DUS 10/15/91	LF1EUS 10/15/91
Inorganics	N																				
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	-	-	-	-	-	-	-	-	-	6.5	7.9	2.5	4.9	6.9
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	-	-	-	-	-	-	-	-	-	6.2	8.2	12	5.5	6.7
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		20.0	YES	-	-	-	-	-	-	-	-	-	37	30	39	22	44
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	8,400		1.76	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material.
 1 Area A - Treating Area
 1 Area B - CCA Area
 1 Area C - Creo-Penta Track Area
 1 Area D - Old Ditch Area
 1 Area E - Bulk Storage Area (Creosote Storage Area Only)
 1 Area F - Banding House Area
 1 Area G - Product Storage Area
 2 #1 - Road in Front of Old #5 Pole Machine
 2 #2 - Road in Front of Old #5 Pole Machine
 2 #3 - Road Crossing Separating State Ports & City
 2 #4 - Road Crossing Separating State Ports & City

J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	LF2AUS	LF2BUS	LF2CUS	LF2DUS	LF2EUS	LF2A	LF1A	NTA-1	NTA-2	NTA-3	NTA-4	NTA-5	NTA-6
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	2/15/96	2/15/96	2/26/91	2/26/91	2/26/91	2/26/91	2/26/91	2/26/91
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	7.9	8.3	5.6	6.4	6.7	6.2	5.9	11	1.8	30	2.8	7.1	25
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	15	11	6.2	7.1	7.8	1.3	1.3	8.4	3.8	15	5.1	4.7	4.3
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	590	15,200		20.0	YES	42	44	41	35	39	8.2	7.7	72	11	300	4.5	56	51
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		1.76	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	6,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material
 J = Estimated Value
 C = Carcinogen
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 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

¹ Area A - Treating Area
¹ Area B - CCA Area
¹ Area C - Creo-Penta Track Area
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¹ Area E - Bulk Storage Area (Creosote Storage Area Only)
¹ Area F - Banding House Area
¹ Area G - Product Storage Area
² #1 - Road in Front of Old #5 Pole Machine
² #2 - Road in Front of Old #5 Pole Machine
² #3 - Road Crossing Separating State Ports & City
² #4 - Road Crossing Separating State Ports & City

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	NTA-7	NTA-8	NTA-9	NTB-1	NTB-2	NTB-3	NTB-4	NTB-5	NTB-6	NTB-7	NTB-8	NTB-9	NTB-10
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/26/91	2/26/91	2/26/91	3/1/91	3/1/91	2/28/91	3/1/91	3/1/91	2/28/91	2/28/91	3/1/91	3/1/91	3/1/91
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	58J	0.39	2.7	4	1	YES	63	10	54	7.0	ND	4.8	1.7	1.8	5.0	9.4	5.3	12	4.7
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	13	5.9	8.9	8.0	1.8	9.1	2.9	3.2	2.3	2.7	5.6	5.7	2.2
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		20.0	YES	240	7.8	8.8	30	ND	4.3	9.7	3.9	11	2.8	90	130	8.6
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	8,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		1.78	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG: _____
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
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²#4 - Road Crossing Separating State Ports & City

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	NTB-11 3/1/91	NTB-12 3/1/91	NTB-13 3/1/91	TWS-1A 2/28/91	TWS-2A 2/28/91	TWS-3A 2/28/91	TWS-4A 2/28/91	TWS-5A 2/28/91	TWS-6A 2/28/91	TWS-7A 2/27/91	TWS-8A 2/27/91	TWS-9A 2/27/91
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	8.1	3.2	13	6.8	6.4	13	26	41	8.7	2.7	1.9	ND
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	4.6	1.4	22	6.5	8.82	7.0	8.4	19	13	5.3	3.4	4.1
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	560	15,200		20.0	YES	81	3.1	20	88	ND	8.2	7.3	71	7.2	3.8	4.4	3.3
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		1.76	YES	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

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J = Estimated Value

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TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWS-10A 2/27/91	TWS-11A 2/27/91	TWS-12A 2/27/91	TWS-13A 2/27/91	² #1 3/12/93	² #2 3/12/93	² #3 3/12/93	² #4 3/12/93	TWSB1A 2/14/96	TWSB2A 2/14/96	TWSB3A 2/14/96	TWSB4A 2/14/96	TWSB5A 2/14/96
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	ND	6.6	ND	ND	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	1.3	31	ND	1.8	10	2.8	ND	2.9	4.1	1.4	ND	38	5.7
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	ND	ND	ND	ND	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	2.7	11	2.7	5.2	130	150	16	75	19	2.1	1.9	29	5.1
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		20.0	YES	17	15	ND	ND	40	46	6.8	17	21	8.2	ND	47	27
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	ND	ND	ND	ND	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	590	510	59	420	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		1.76	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	ND	0.012	ND	0.018	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	17	110	ND	5.4	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	240	310	40	150	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

¹ Area A - Treating Area

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² #3 - Road Crossing Separating State Ports & City

² #4 - Road Crossing Separating State Ports & City

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWSB6A 2/14/96	TWSB7A 2/14/96	TWSB8A 2/14/96	TWSB9A 2/14/96	TWSB10A 2/14/96	TWSB11A 2/14/96	TWSB12A 2/14/96	TWSB13A 2/14/96	TWSB14A 2/14/96	TWSB15A 2/14/96	TWSB15ADU 2/14/96	PDA1A 2/14/96	PDA2A 2/14/96
Inorganics	N																			
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	5.9	ND	ND	16	ND	20	5.3	42	ND	13	14	1,300	5.6
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,406	1	YES	6.1	2.5	2.7	7.2	1.8	5.2	5.0	39	2.0	12	13	1,200	9.3
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		20.0	YES	53	ND	ND	28	ND	10	6.9	110	ND	48	60	1,600	11
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		1.76	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material.
 1 Area A - Treating Area
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 2 #1 - Road in Front of Old #5 Pole Machine
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J = Estimated Value
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 Res = Residential
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TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	PDA3A	PDA4A	PDA5A	PDA6A	PDA7A	PDA8A	PDA9A	PDA10A	PDA11A	SS-01	*SS-02	*SS-03	SS-04	SS-05	SS-06	SS-07
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
Aluminum	N	4,700	15,200	20,000		72**	YES	-	-	-	-	-	-	-	-	-	990	2,400	4,700	710	710	1,200	1,200
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	1.8J	56J	5.4	ND	2.2	210	16
Arsenic	C	56J	0.39	2.7	4	1	YES	27	3.2	3.1	67	74	45	2.5	ND	ND	1.8J	56J	5.4	ND	2.2	210	16
Barium	N	43	1,080	20,000		40.0	YES	-	-	-	-	-	-	-	-	-	8.8	27	43	13	4.6	28	22
Cadmium	N	ND	7.4	162		0.1	YES	-	-	-	-	-	-	-	-	-	ND						
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	1,200J	580J	4,800	260J	230	22,000	720
Chromium	C	10.9	30	64	1,406	1	YES	37	6.9	9.0	56	84	38	5.3	1.5	2.7	3.6	3.5J	10.9	2.2J	2.2	130J	9.2
Cobalt	N	1.8J	940	20,000		4.4**	YES	-	-	-	-	-	-	-	-	-	ND	1.4J	1.8J	ND	ND	1.6J	ND
Copper	N	24	560	15,200		20.0	YES	32	15	11	150	89	88	19	ND	ND	19	24	24	5.7J	14	170J	16
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	-	-	-	-	-	-	-	-	-	2,000J	5,000J	6,600	2,300J	1,300	11,000	2,500
Lead	N	100	400	400		0.3	YES	-	-	-	-	-	-	-	-	-	25J	54J	100	5.6J	2.6	19J	37
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	200	220	640	84	110	480J	140
Manganese	N	65	360	6,400		1.76	YES	-	-	-	-	-	-	-	-	-	11	60	65	21	8.8J	110J	40J
Mercury	N	ND	4.6	122		0.022	YES	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	0.17	0.12
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	1.3J	3.3J	ND	ND	ND	ND	ND
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	220	170	300	120	ND	150	ND
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	26	16J	270	13J	87	62	34
Vanadium	N	12	110	2,800		0.52**	YES	-	-	-	-	-	-	-	-	-	4.3J	4.7J	12	3.5J	2.4J	4.1J	4.6J
Zinc	N	100	4,600	20,000		42	YES	-	-	-	-	-	-	-	-	-	11	18	100	40	13	57	32

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material.
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¹ Area A - Treating Area
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TABLE 5-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	SS-08	SS-09	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
Aluminum	N	4,700	15,200	20,000		72**	YES	1,900	1,500	1,900	2,400	2,300	2,000	3,700	640	310	650	1,200	3,400	1,000	2,100
Antimony	N	-	6.2	164		0.12	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	56J	0.39	2.7	4	1	YES	27	ND	18	ND	12	3.1	5	ND	ND	ND	ND	3J	83	43
Barium	N	43	1,080	20,000		40.0	YES	21	3.2	12	17	11	3	15	23	2	4.1	3	7.7	4.5	7.2
Cadmium	N	ND	7.4	162		0.1	YES	ND	1J	ND											
Calcium	?	4,800					YES	15,000	5,200	710	640	7,700	280	1,200	33J	ND	ND	15J	37J	130,000	9,700
Chromium	C	10.9	30	64	1,408	1	YES	22	2.8	8.7	6.3	18	4.1	7.8J	2.9	1.7J	2.2J	4	9.2	61	19
Cobalt	N	1.8J	940	20,000		4.4**	YES	0.80J	ND	2.8J	ND										
Copper	N	24	580	15,200		20.0	YES	55	ND	18	ND	11	ND	35J	ND	ND	ND	ND	ND	110	29
Cyanide	N	-	2.2	7		3.08	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		22**	YES	3,500	1,300	3,100	1,100	2,400	1,600	4,600	1,100J	650	1,300	2,200J	4,700J	20,000	1,300
Lead	N	100	400	400		0.3	YES	19	2.7	9.9	24	45	3.2	16J	2.8J	2.8	6.5	5.5J	6.1J	6.1	8
Magnesium	?	640					YES	610	170	140	91	260	68	370J	96	ND	82	170	430	4,700	290
Manganese	N	65	360	6,400		1.76	YES	120	11J	28J	6.4J	34	8	53J	6.9	3.8J	4.9J	9.2	14	230	13J
Mercury	N	ND	4.6	122		0.022	YES	0.22	ND	0.15	ND	ND	ND	0.77	ND						
Nickel	N	3.3J	320	8,200		0.10	YES	ND	6J	ND											
Potassium	?	300					YES	310	ND	ND	ND	240J	ND	230	180	ND	ND	210	600	280	ND
Sodium	?	270					YES	230	110	120	ND	100	ND	46	ND	ND	ND	ND	ND	260	92
Vanadium	N	12	110	2,800		0.52**	YES	5.7J	2.4J	5.9J	6.2J	5.4J	3.6J	9J	3.6J	ND	2.6J	6.3J	14	19	3.6J
Zinc	N	100	4,600	20,000		42	YES	43	6.7	14	57	32	7	37	1.8J	5.6	6.9	5.6	8.3	11	12

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
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J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

TABLE 5-4. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE SOIL CONSTITUENTS - PESTICIDES AND PCBs
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters-(mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	JA-C1	LA-C2	LB-C3	LC-C4	'#1	'#2	'#3	'#4	PDA12C	PDA13C	NTB3	NTB4
Pesticides/PCB-Compounds	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	1/7/85	1/7/85	1/7/85	1/7/85	3/12/93	3/12/93	3/12/93	3/12/93	2/15/96	2/15/96	2/15/96	2/15/96
4,4'-DDD-(P,P'-DDD)	C	-	2.4	17		0.0028	YES***	ND	ND	ND	ND	ND	0.014	ND	ND	-	-	-	-
4,4'-DDE-(P,P'-DDE)	C	0.015J	1.7	12		0.002	NO	ND	ND	ND	ND	0.024	0.029	0.0039	0.022	-	-	-	-
4,4'-DDT-(P,P'-DDT)	C/N	0.010J	1.7	12		0.004**	NO	ND	ND	ND	ND	0.079	0.16	0.030	0.10	-	-	-	-
Aldrin	C/N	-	0.029	0.15		0.00008**	NO	ND	ND	ND	ND	ND	ND	ND	0.0030	-	-	-	-
Endosulfan-I-(Alpha)	N	ND	74	1060		4.4**	NO	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin	N	ND	3.6	52		0.04	NO	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Gamma-BHC-(Lindane)	C	-	0.44	2.9		0.004	NO	ND	ND	ND	ND	ND	ND	ND	0.0023	-	-	-	-
Heptachlor	C/N	-	0.11	0.55		0.00016	NO	ND	ND	ND	ND	ND	ND	ND	0.0019	-	-	-	-
PCB-1260-(Aroclor-1260)	C	-	1	1	18	0.01	NO	ND	ND	ND	ND	ND	0.060	ND	0.11	-	-	-	-

Parameters-(mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWS10	TWS14	SS-01	*SS-02	*SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09	SS-10
Pesticides/PCB-Compounds	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/15/96	2/15/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
4,4'-DDD-(P,P'-DDD)	C	-	2.4	17		0.0028	YES***	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE-(P,P'-DDE)	C	0.015J	1.7	12		0.002	NO	-	-	ND	ND	0.015J	ND						
4,4'-DDT-(P,P'-DDT)	C/N	0.010J	1.7	12		0.004**	NO	-	-	ND	ND	0.010J	ND						
Aldrin	C/N	-	0.029	0.15		0.00008**	NO	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan-I-(Alpha)	N	ND	74	1060		4.4**	NO	-	-	ND	ND	ND	ND	0.075J	ND	0.130N	0.078J	ND	ND
Endrin	N	ND	3.6	52		0.04	NO	-	-	ND									
Gamma-BHC-(Lindane)	C	-	0.44	2.9		0.004	NO	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	C/N	-	0.11	0.55		0.00016	NO	-	-	-	-	-	-	-	-	-	-	-	-
PCB-1260-(Aroclor-1260)	C	-	1	1	18	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	-

Parameters-(mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21
Pesticides/PCB-Compounds	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
4,4'-DDD-(P,P'-DDD)	C	-	2.4	17		0.0028	YES***	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE-(P,P'-DDE)	C	0.015J	1.7	12		0.002	NO	ND										
4,4'-DDT-(P,P'-DDT)	C/N	0.010J	1.7	12		0.004**	NO	ND										
Aldrin	C/N	-	0.029	0.15		0.00008**	NO	-	-	-	-	-	-	-	-	-	-	-
Endosulfan-I-(Alpha)	N	ND	74	1060		4.4**	NO	ND	0.0060N	ND	0.0052N	0.018						
Endrin	N	ND	3.6	52		0.04	NO	ND	ND	ND	0.0150N	ND						
Gamma-BHC-(Lindane)	C	-	0.44	2.9		0.004	NO	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	C/N	-	0.11	0.55		0.00016	NO	-	-	-	-	-	-	-	-	-	-	-
PCB-1260-(Aroclor-1260)	C	-	1	1	18	0.01	NO	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
Cancer Risk = 1E-06 and Chronic HQ = 0.2

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence for Presence of Material.

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

YES*** Constituent detected but is below groundwater standard.

#1 - Road In Front of Old #5 Pole Machine

#2 - Road In Front of Old #5 Pole Machine

#3 - Road Crossing Separating State Ports & City

#4 - Road Crossing Separating State Ports & City

**TABLE 5-5. SURFACE SOIL SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Protect. GW PRG	Present In GW	TEF	LF1A 10/9/90	LF2A 10/9/90	LF1A 2/15/96	LF2A 2/15/96	SS-02 10/4/96	SS-06 10/4/96	SS-13 10/4/96	SS-14 10/4/96	SS-15 10/4/96	SS-17 10/4/96	SS-19 10/4/96
2378-TCDD	C	ND	4	27	334	0.0044	NO	1	4	8	2.4	4.2	ND	23	ND	ND	ND	ND	0.9J
12378-PeCDD	C	0.00076J	8	54	668	0.0088	NO	0.5	30	50	42.2	55.2	0.76J	360	12J	40	ND	ND	2.6J
123478-HxCDD	C	ND	40	270	3,340	0.044	NO	0.1	100	180	191	263	ND	1100	44J	250	ND	46J	7
123678-HxCDD	C	ND	40	270	3,340	0.044	NO	0.1	1300	1800	1600	1910	ND	2500	130	1700	ND	350	12
123789-HxCDD	C	0.0013J	40	270	3,340	0.044	NO	0.1	220	890	526	789	1.3J	1800	130	660	ND	120	14
1234678-HpCDD	C	ND	400	2,700	33,440	0.44	YES**	0.01	65500	98700	55750	90080	ND	84000	7900J	76000	ND	24000	460
OCDD	C	ND	4,000	27,000	334,400	4.4	YES**	0.001	621000	932000	583460	496210	ND	1000000	100000	940000	ND	300000	4400J
2378-TCDF	C	ND	40	270	668	0.044	NO	0.1	20	20	11.3	14.5	ND	100J	ND	16J	ND	ND	ND
12378-PeCDF	C	-	80	540	6,680	0.088	NO	0.05	60	60	55.2	63.3	-	-	-	-	-	-	-
23478-PeCDF	C	0.0032J	8	54	3,340	0.0088	NO	0.5	60	60	51.1	53.1	3.2J	170	ND	66	ND	ND	1.2J
123478-HxCDF	C	-	40	270	3,340	0.044	NO	0.1	710	760	956	1160	-	-	-	-	-	-	-
123678-HxCDF	C	0.0040J	40	270	3,340	0.044	NO	0.1	240	210	206	217	4.0J	550	ND	390	2.0J	ND	2.1J
234678-HxCDF	C	0.017	40	270	3,340	0.044	NO	0.1	160	140	469	171	17	1100	ND	580	2.6J	ND	ND
123789-HxCDF	C	-	40	270	33,440	0.044	NO	0.1	40	50	44.8	62.5	-	-	-	-	-	-	-
1234678-HpCDF	C	0.042	400	2,700	33,440	0.44	YES**	0.01	59500	66000	56260	51580	42	12000	2500	94000	410	3100	160
1234789-HpCDF	C	0.0010J	400	2,700	33,440	0.44	NO	0.01	770	960	1100	1080	1.0J	850	68J	1100	4.6J	99J	ND
OCDF	C	0.028	4,000	27,000	334,400	4.4	NO	0.001	63200	83300	154750	155250	28	52000	5000	75000	210	11000	250
Total TCDDs	C	0.0028J							140	170	61	91.8	2.8J	1200J	ND	82J	ND	ND	2.3J
Total PeCDDs	C	0.0041J							480	650	736	879	4.1	4300J	12J	750J	ND	16J	14J
Total HxCDDs	C	0.018J							16400	22500	18060	26080	18J	22000J	2500J	28000J	4.8J	4600J	130J
Total HpCDDs	C	0.080J							461000	573000	290890	298650	80J	180000J	33000J	460000J	47J	110000J	1200J
Total TCDFs	C	0.046J							90	100	68.9	96.5	46J	470J	ND	71J	ND	ND	ND
Total PeCDFs	C	0.370J							920	870	1110	1050	370J	2800J	58J	1300J	4.9J	100J	19J
Total HxCDFs	C	0.230J							31400	34400	31580	38630	230J	12000J	1100J	15000J	180J	1800J	77J
Total HpCDFs	C	0.043J							147000	164000	133590	120130	43J	13000J	2600J	95000J	420J	3200J	160J
2378-TCDD TEQ			4	27	334				2,273	3,143	2,322	2,322	5	3,024	161	3,139	5	635	17

NOTES:

All results are in parts per trillion (ppt) by USEPA Method 8290

USEPA Region 9 Preliminary Remediation Goals (PRGs).

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

TEQ calculated using zero for not-detected (ND).

Cancer Risk=1E-06 & Chronic HQ=0.2

Exceeds Highest PRG.

SW = Surface Water

- = Not Analyzed

ND = Not Detected

J = Estimated Value

Protect = Protection of GW Goal = 20 times the GW standard.

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

* Background Sample

GW = Groundwater

BKGD = Background

Filtered groundwater samples used for presence in groundwater.

** Present in groundwater but is below groundwater PRG.

**TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	¹ SWP-2	¹ SWP-4	¹ NCDDR-2	¹ NCDDR-4	² AREA B-8	LF1AM	LF1BM	LF1CM	LF1DM	LF1EM	LF2AM	LF2BM	LF2CM	LF2DM
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	4/30/82	4/30/82	4/30/82	4/30/82	6/83-9/83	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	20	ND	ND
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	-	-	-	-	-	ND	15	ND	ND	ND	10	41	ND	ND
Acenaphthene	N	ND	740	7600		1.6	YES	-	-	-	-	-	ND	ND	ND	ND	ND	28	ND	ND	ND
Acenaphthylene	N	ND	460***	10,800***			NO	-	-	-	-	-	ND								
Alkanes	?	-	-	-	-	-	-	190	17	200	ND	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		42	YES	-	-	-	-	-	3.4J	200	58	4.7J	5.0J	280	400	72	15
Benz(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	ND	14	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.00094	YES	ND	ND	-	-	-	5.8J	8.6	3.7J	3.4J	7.4	110	13	19	27
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i) Perylene	N	ND	460***	10,800***		4.2	YES	ND	ND	-	-	-	7.3	9.4	6.5J	7.3	8.1	46	30	16	33
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Biphenyl	N	-	350	350			NO	-	-	-	-	-	5.0J	ND	ND	4.8J	ND	17	ND	13	34
Carbazole	C	ND	24	120	40,019	0.068**	YES	-	-	-	-	-	ND	90	9.6	ND	ND	200	160	23	4.6J
Carboxylic Acids	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	ND	11	ND	ND	-	9.5	15	8.9	7.3	8.1	120	18	22	40
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.00094	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	N	ND	58	1020		0.56	YES	-	-	-	-	-	ND	11	ND	ND	ND	26	20	3.8J	ND
Fluoranthene	N	ND	460	6000		5.6	YES	130	28	-	-	-	13	34	8.9	9.5	4.4J	300	27	38	65
Fluorene	N	ND	520	6600		5.6	YES	ND	ND	-	-	-	ND	27	5.8J	ND	ND	91	57	ND	ND
Indeno(1,2,3-cd)pyrene	C	ND	0.62	2.9	1,097	0.0094	YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	ND	ND	100	ND	0.1	ND	12	ND	ND	ND	ND	30	5.1J	3.7J
Pentachlorophenol	C	-	3	11	59	0.006	YES	250	ND	ND	ND	0.91	ND								
Perylene	?	-	-	-	-	-	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	ND	ND	-	-	4.8	3.9J	41	8.1	ND	4.6J	200	86	17	12
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	94	21	81	ND	-	13	27	11	9.5	6.0J	200	23	36	66
Tetrachlorophenols	N	-	360	5200		4.2	YES	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material.
 M = Landfarm 9 to 12 inches below surface
 L = Landfarm 21 to 24 inches below surface
 S = Substrate 6 inches below landfarm
 B = 6 inches above base of landfarm
 C = Substrate below landfarm
 *** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG

S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected
 LF1 = Landfarm area 1
 LF2 = Landfarm area 2
 J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial

¹ SWP-1 & 3, NCDHR-1 & 3 are Splits from Creosote and PCP Drip Track Area
² Area B - CCA Area

TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	LF2EM	LF1A1	LF1BL	LF1CL	LF1DL	LF1EL	LF2AL	LF2BL	LF2CL	LF2DL	LF2EL	LF1AS	LF1BS
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90	10/10/90
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	ND												
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	ND	11	ND	ND	ND								
Acenaphthene	N	ND	740	7600		1.6	YES	ND	24	ND	ND	ND								
Acenaphthylene	N	ND	460***	10,800***			NO	ND												
Alkanes	?	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		42	YES	50	3.7J	4.6J	6.8J	3.6J	ND	ND	66	ND	290	14	ND	ND
Benz(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	-	-	-	-	-	-	-	-	-	-	-	ND	ND
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	13	39	10	42	18	ND	ND	21	18	100	11	-	-
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	N	ND	460***	10,800***		4.2	YES	15	32	10	22	16	3.5J	ND	41	11	65	12	ND	ND
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl	N	-	350	350			NO	7.1J	16	3.9J	6.5J	7.4J	ND	ND	16	4.2J	14	8.6	ND	ND
Carbazole	C	ND	24	120	40,019	0.068**	YES	17	ND	ND	ND	ND	ND	ND	30	ND	75	1.9J	ND	ND
Carboxylic Acids	?	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	19	59	18	59	40	3.7J	3.6J	31	32	150	16	ND	ND
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	N	ND	58	1020		0.56	YES	ND	5.6J	ND	20	ND	ND	ND						
Fluoranthene	N	ND	460	6000		5.6	YES	36	80	20	120	71	6.8J	5.0J	82	47	500	32	ND	ND
Fluorene	N	ND	520	6600		5.6	YES	6.1J	ND	ND	ND	ND	ND	ND	12	ND	54	ND	ND	ND
Indeno(1,2,3-cd)pyrene	C	ND	0.62	2.9	1,097	0.0094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	ND	11	2.1J	ND	ND								
Pentachlorophenol	C	-	3	11	59	0.006	YES	ND	20J	ND	ND	ND								
Perylene	?	-					NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	14	6.2J	ND	13	14	ND	ND	24	6.0J	130	5.7	ND	ND
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	34	80	20	110	68	6.5J	4.7J	78	41	500	30	ND	ND
Tetrachlorophenols	N	-	360	5200		4.2	YES	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
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 *** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
 S-Spec. = Site Specific
 - = Not Analyzed
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 LF1 = Landfarm area 1
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 J = Estimated Value
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 Ind = Industrial

TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	LF1CS 10/10/90	LF1DS 10/10/90	LF1ES 10/10/90	LF2AS 10/10/90	LF2BS 10/10/90	LF2CS 10/10/90	LF2DS 10/10/90	LF2ES 10/10/90	LF1ALS 10/15/91	LF1BLS 10/15/91	LF1CLS 10/15/91	LF1DLS 10/15/91	LF1ELS 10/15/91
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	ND	0.17J	0.11J	0.097J	0.070J	0.063J							
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	ND	0.057J	0.050J	ND	ND
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	ND	0.29J	0.18J	0.14J	0.067J	0.11J							
Acenaphthene	N	ND	740	7600		1.6	YES	ND	1.9J	1.1J	0.15J	0.18J	0.070J							
Acenaphthylene	N	ND	460***	10,800***			NO	ND	0.59J	4.1J	0.58	0.13J	0.35							
Alkanes	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		42	YES	ND	3.0J	ND	0.36J	ND	ND	0.97	ND	5.7	16	2.3	1.0	1.8
Benz(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	ND	13	ND	1.2	0.21J	ND	1.0	ND	24	31	5.7	2.1	2.0
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	-	-	-	-	-	-	-	-	14	21	4.1	1.8	1.5
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	36	61	18	3.4	4.4
Benzo(g,h,i)Perylene	N	ND	460***	10,800***		4.2	YES	ND	5.9J	ND	1.3	0.30J	ND	0.97	ND	6.5	9.1	1.8	0.70	0.60
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl	N	-	350	350			NO	ND	ND	ND	0.71	ND	ND	0.47	ND	0.092J	0.066J	0.040J	0.022J	0.028J
Carbazole	C	ND	24	120	40,019	0.068**	YES	ND	1.1J	5.4J	0.97	0.98	1.1							
Carboxylic Acids	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	ND	19	ND	1.9	0.35J	ND	1.4	ND	28	36	8.9	3.0	2.9
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	ND	0.047J	ND	ND	ND
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	-	-	-	-	-	-	-	-	2.9J	2.3J	0.58	0.26J	ND
Dibenzofuran	N	ND	58	1020		0.56	YES	ND	0.89J	0.31J	0.18J	0.21J	0.14J							
Fluoranthene	N	ND	460	6000		5.6	YES	ND	24	ND	2.3	0.63	ND	2.3	ND	77	72	12	4.7	3.7
Fluorene	N	ND	520	6600		5.6	YES	ND	2.4J	1.1J	0.20J	0.21J	0.18J							
Indeno(1,2,3-cd)pyrene	C	ND	0.62	29	1,097	0.0094	YES	-	-	-	-	-	-	-	-	9.2	12	1.9	0.74	0.70
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	ND	ND	ND	0.33J	ND	ND	ND	ND	0.56J	0.27J	0.23J	0.088J	0.13J
Pentachlorophenol	C	-	3	11	59	0.006	YES	ND	ND	ND	ND	ND	ND	0.80J	ND	3.9J	4.3J	1.3J	ND	0.070J
Perylene	?						NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	ND	6.5J	ND	0.49	ND	ND	0.40J	ND	15	17	1.4	3.3	0.98
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND
Pyrene	N	0.049J	460	10800		4.2	YES	ND	23	ND	2.0	0.60	ND	2.2	ND	69	62	10	5.7	4.2
Tetrachlorophenols	N	-	360	5200		4.2	YES	-	-	-	-	-	-	-	-	ND	0.44J	0.13J	ND	0.045J

Notes:

- USEPA Region 9 Preliminary Remediation Goals (PRGs)
- Cancer Risk = 1E-06 and Chronic HQ = 0.2
- ? No health data evaluation as to carcinogenicity.
- Exceeds Highest PRG.**
- * Background Location
- ** GW standard based on Region 9 Tap Water Concentration
- Prot. GW = Protection of Groundwater = 20 X GW Standard
- N = Presumptive Evidence of Presence of Material.
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- Res = Residential
- Ind = Industrial

**TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	LF2ALS 10/15/91	LF2BLS 10/15/91	LF2CLS 10/15/91	LF2DLS 10/15/91	LF2ELS 10/15/91	LF1B 2/15/96	LF2B 2/15/96	LF1C 2/15/96	LF2C 2/15/96	TWS-1B 2/28/91	TWS-2B 2/28/91	TWS-3B 2/28/91	TWS-4B 2/28/91	TWS-5B 2/28/91	TWS-6B 2/28/91
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	0.13J	0.29J	0.34J	1.6J	0.41J	ND	ND	ND	ND	-	-	-	-	-	-
2,4-Dimethylphenol	N	ND	2400			2.8	YES	0.082J	0.037J	0.12J	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	0.22J	0.88J	0.85J	8.0J	2.4J	ND	ND	ND	ND	-	-	-	-	-	-
Acenaphthene	N	ND	740	7600		1.6	YES	0.62J	1.6J	1.7J	92	8.1J	ND	ND	ND	ND	ND	ND	47	ND	ND	ND
Acenaphthylene	N	ND	460***	10,800***			NO	2.4J	2.4J	4.3J	5.4J	5.0J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkanes	?	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		42	YES	9.5	19	84	170	93	ND	5.0	ND	ND	ND	ND	51	ND	ND	ND
Benz(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	12	12	28	130	63	4.0	4.3	ND	ND	ND	0.66	17	ND	ND	ND
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	9.6	9.2	27	61J	29J	4.6	6.2	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	9.2	11	ND	0.68	ND	ND	20	ND	ND	ND
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	32	21	81	190	90	13	14	ND	0.68	-	-	-	-	-	-
Benzo(g,h,i) Perylene	N	ND	460***	10,800***		4.2	YES	3.7J	5.5	5.6J	6.7J	8.3J	2.8	4.2	ND	ND	-	-	-	-	-	-
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	-	-	-	-	-	3.7	3.5	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	N	-	350	350			NO	0.078J	0.18J	0.27J	2.3J	0.59J	ND	ND	ND	ND	-	-	-	-	-	-
Carbazole	C	ND	24	120	40,019	0.068**	YES	3.1J	6.8	15	46J	28J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carboxylic Acids	?	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	18	15	41	150	69	5.8	5.5	ND	0.48	ND	0.73	13	ND	ND	ND
Cresol (ortho)	N	ND	620	8800		1.8**	YES	ND	0.040J	0.026J	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	0.070J	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	1.2J	2.6J	4.0J	6.6J	5.1J	-	-	-	-	ND	ND	ND	ND	ND	ND
Dibenzofuran	N	ND	58	1020		0.56	YES	0.49J	1.7J	2.2J	21J	5.6J	ND	ND	ND	ND	-	-	-	-	-	-
Fluoranthene	N	ND	460	6000		5.6	YES	24	30	83	520	350	8.1	8.2	ND	0.88	ND	1.0	150	0.95	ND	ND
Fluorene	N	ND	520	6600		5.6	YES	1.2J	2.8J	7.2J	59J	19J	ND	ND	ND	ND	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	C	ND	0.62	29	1,097	0.0094	YES	5.2	6.8	9.8	18J	12J	3.2	5.3	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	0.36J	1.4J	1.9J	14J	2.5J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	C	-	3	11	59	0.006	YES	2.8J	10	22J	150J	19J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?	-					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	4.1	13	21	91	45	2.8	2.8	ND	0.44	ND	ND	220	ND	ND	ND
Phenol	N	ND	7400	20000		6.0	YES	ND	ND	ND	2.2J	ND	ND	ND	ND	ND	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	25	25	74	980	310	-	-	-	-	-	-	-	-	-	-
Tetrachlorophenols	N	-	360	5200		4.2	YES	0.25J	0.52J	0.85J	3.5J	1.1J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs) S-Spec. = Site Specific
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 - = Not Analyzed
 ? No health data evaluation as to carcinogenicity. ND = Not Detected
 Exceeds Highest PRG. LF1 = Landfarm area 1
 * Background Location LF2 = Landfarm area 2
 ** GW standard based on Region 9 Tap Water Concentration J = Estimated Value
 Prot. GW = Protection of Groundwater = 20 X GW Standard C = Carcinogen
 N = Presumptive Evidence of Presence of Material. N = Non-carcinogen
 M = Landfarm 9 to 12 inches below surface Res = Residential
 L = Landfarm 21 to 24 inches below surface Ind = Industrial
 S = Substrate 6 inches below landfarm
 B = 6 inches above base of landfarm
 C = Substrate below landfarm
 *** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG

**TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWS-7B 2/28/91	TWS-8B 2/28/91	TWS-9B 2/28/91	TWS-10B 2/28/91	TWS-11B 2/28/91	TWS-12B 2/28/91	TWS-13B 2/28/91	TWSB1B 2/14/96	TWSB2B 2/14/96	TWSB3B 2/14/96	TWSB4B 2/14/96	TWSB5B 2/14/96	TWSB6B 2/14/96
Extractable Organics	N																			
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	N	ND	740	7600		1.6	YES	ND	ND	ND	2000	ND	ND	ND	ND	ND	ND	75	ND	ND
Acenaphthylene	N	ND	460***	10,800***			NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkanes	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		4.2	YES	ND	ND	ND	2200	ND	ND	ND	ND	ND	ND	34	ND	ND
Benzo(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	ND	ND	ND	800	ND	12	ND	ND	ND	ND	73	15	5.5
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	ND	ND	ND	290	ND	ND	ND	ND	ND	ND	57	10	6.0
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	ND	ND	ND	690	1.0	30	ND	ND	ND	ND	99	21	8.7
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	N	ND	460***	10,800***		4.2	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	7.3	3.2
Biphenyl	N	-	350	350			NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C	ND	24	120	40,019	0.068**	YES	ND	ND	ND	390	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carboxylic Acids	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	ND	ND	ND	740	0.49	19	ND	ND	ND	ND	92	16	5.2
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	N	ND	58	1020		0.56	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	N	ND	460	6000		5.6	YES	ND	ND	ND	3700	0.43	42	ND	ND	ND	ND	240	22	7.4
Fluorene	N	ND	520	6600		5.6	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	C	ND	0.62	2.9	1,097	0.0094	YES	ND	ND	ND	88	ND	ND	ND	ND	ND	ND	ND	ND	3.3
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	C	-	3	11	59	0.006	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?						NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	ND	ND	ND	4000	ND	ND	ND	ND	ND	ND	280	ND	ND
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachlorophenols	N	-	360	5200		4.2	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

- USEPA Region 9 Preliminary Remediation Goals (PRGs).
- Cancer Risk = 1E-06 and Chronic HQ = 0.2
- ? No health data evaluation as to carcinogenicity.
- Exceeds Highest PRG.**
- * Background Location
- ** GW standard based on Region 9 Tap Water Concentration
- Prot. GW = Protection of Groundwater = 20 X GW Standard
- N = Presumptive Evidence of Presence of Material.
- M = Landfarm 9 to 12 inches below surface
- L = Landfarm 21 to 24 inches below surface
- S = Substrate 6 inches below landfarm
- B = 6 inches above base of landfarm
- C = Substrate below landfarm
- *** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
- S-Spec. = Site Specific
- = Not Analyzed
- ND = Not Detected
- LF1 = Landfarm area 1
- LF2 = Landfarm area 2
- J = Estimated Value
- C = Carcinogen
- N = Non-carcinogen
- Res = Residential
- Ind = Industrial

TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWSB7B 2/14/96	TWSB8B 2/14/96	TWSB9B 2/14/96	TWSB10B 2/14/96	TWSB11B 2/14/96	TWSB12B 2/14/96	TWSB13B 2/14/96	TWSB14B 2/14/96	TWSB15B 2/14/96	PDA1B 2/14/96	PDA2B 2/14/96	PDA3B 2/14/96	PDA4B 2/14/96
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	N	ND	740	7600		1.6	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4
Acenaphthylene	N	ND	460***	10,800***			NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkanes	?	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		42	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.47
Benz(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	ND	ND	ND	ND	ND	ND	0.57	1.6	4.7	0.71	0.51	1.3	0.64
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	ND	ND	ND	ND	ND	ND	0.60	1.7	4.6	0.78	0.47	1.1	0.53
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	ND	ND	ND	ND	ND	ND	1.4	2.2	7.9	2.2	1.3	2.5	1.7
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	N	ND	460***	10,800***		4.2	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	ND	ND	ND	ND	ND	ND	0.78	0.69	3.1	0.74	0.44	1.0	ND
Biphenyl	N	-	350	350			NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C	ND	24	120	40,019	0.068**	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carboxylic Acids	?	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	ND	ND	ND	ND	ND	ND	1.1	2.3	5.7	1.3	0.93	2.4	1.0
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	N	ND	58	1020		0.56	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	N	ND	460	6000		5.6	YES	ND	ND	0.65	0.67	ND	ND	0.94	1.9	8.8	1.3	1.0	7.0	1.9
Fluorene	N	ND	520	6600		5.6	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	C	ND	0.62	2.9	1,097	0.0094	YES	ND	ND	ND	ND	ND	ND	0.74	2.6	0.61	ND	ND	ND	ND
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.86
Pentachlorophenol	C	-	3	11	59	0.006	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?	-					NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	ND	ND	ND	ND	ND	ND	ND	ND	1.9	ND	ND	ND	1.8
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachlorophenols	N	-	360	5200		4.2	YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

M = Landfarm 9 to 12 Inches below surface

L = Landfarm 21 to 24 Inches below surface

S = Substrate 6 inches below landfarm

B = 6 inches above base of landfarm

C = Substrate below landfarm

*** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

LF1 = Landfarm area 1

LF2 = Landfarm area 2

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

**TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	PDA5B 2/14/96	PDA6B 2/14/96	PDA7B 2/14/96	PDA8B 2/14/96	PDA9B 2/14/96	PDA10B 2/14/96	PDA11B 2/14/96	SB-01 10/4/96	SB-02 10/4/96	SB-03 10/4/96	SB-04 10/4/96	SB-05 10/4/96	SB-06 10/4/96	SB-07 10/4/96	SB-08 10/4/96	SB-09 10/4/96	
Extractable Organics	N																							
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	-	-	-	-	-	-	-	ND	7.2	2400	0.042J						
Acenaphthene	N	ND	740	7600		1.6	YES	ND	ND	ND	ND	2.0	ND	1400	ND	ND	ND	ND	9.4J	0.360J	20	4900	0.059J	
Acenaphthylene	N	ND	460***	10,800***			NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5J	ND	0.062J	
Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6J	-	-	-	-	-	-	1J
Anthracene	N	ND	4400	20000		42	YES	28	ND	0.84	1.8	5.5	ND	3400	ND	ND	0.056J	0.043J	21J	0.058J	5.8	4600	0.091J	
Benz(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	4.2	ND	2.8	4.9	2.8	ND	ND	ND	ND	0.057J	ND	29J	0.042J	6.7	1400	0.530	
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	2.9	ND	1.2	4.2	6.9	ND	ND	ND	ND	ND	0.100J	ND	0.051J	26	370J	0.580	
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	12	ND	3.2	6.2	12	ND	ND	0.044J	ND	0.110J	0.160J	24J	0.077J	55	1,000J	0.960J	
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	N	ND	460***	10,800***		4.2	YES	-	-	-	-	-	-	-	ND	ND	ND	0.077J	ND	0.042J	16	0.042J	0.450J	
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	7.1	ND	1.2	2.8	3.3	ND	ND	-	-	-	-	-	-	-	-	-	-
Biphenyl	N	-	350	350			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C	ND	24	120	40,019	0.068**	YES	5.3	ND	ND	ND	ND	ND	930	ND	ND	ND	ND	ND	ND	4.400J	1,200J	ND	ND
Carboxylic Acids	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	7.9	ND	2.9	4.3	6.2	ND	ND	ND	ND	0.081J	0.160J	35J	0.078J	19	1400	0.740	
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	ND	ND	ND	0.60	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	N	ND	58	1020		0.56	YES	-	-	-	-	-	-	-	ND	ND	ND	ND	69	0.082J	15	4000	ND	
Fluoranthene	N	ND	460	6000		5.6	YES	2.8	ND	3.6	4.9	12	ND	1800	ND	ND	0.220J	0.180J	210	0.077J	11	7300	0.670	
Fluorene	N	ND	520	6600		5.6	YES	-	-	-	-	-	-	-	ND	ND	ND	ND	150	0.190J	18	7000	0.069J	
Indeno(1,2,3-cd)pyrene	C	ND	0.62	29	1,097	0.0094	YES	5.5	ND	0.77	2.4	3.9	ND	ND	ND	ND	ND	0.086J	ND	ND	16	84J	0.0350J	
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	ND	ND	ND	ND	2.3	ND	2100	ND	ND	ND	ND	ND	ND	11	2900	0.054J	
Pentachlorophenol	C	-	3	11	59	0.006	YES	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Perylene	?	-	-	-	-	-	NO	-	-	-	-	-	-	-	-	-	-	0.100J	-	-	2JN	-	-	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	2.1	ND	0.39	2.6	5.0	ND	4400	ND	ND	0.120J	0.100J	430	0.067J	26	15000	0.370J	
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	-	-	-	-	-	-	-	0.049J	ND	0.210J	0.190J	97J	0.071J	23J	4600	0.930J	
Tetrachlorophenols	N	-	360	5200		4.2	YES	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs). S-Spec. = Site Specific
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 - = Not Analyzed
 ? No health data evaluation as to carcinogenicity. ND = Not Detected
 Exceeds Highest PRG. LF1 = Landfarm area 1
 * Background Location LF2 = Landfarm area 2
 ** GW standard based on Region 9 Tap Water Concentration J = Estimated Value
 Prot. GW = Protection of Groundwater = 20 X GW Standard C = Carcinogen
 N = Presumptive Evidence of Presence of Material. N = Non-carcinogen
 M = Landfarm 9 to 12 inches below surface Res = Residential
 L = Landfarm 21 to 24 inches below surface Ind = Industrial
 S = Substrate 6 inches below landfarm
 B = 6 inches above base of landfarm
 C = Substrate below landfarm
 *** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG

TABLE 5-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-17	SB-18	SB-19	SB-20	SB-21
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
1-Methylnaphthalene	?		0.062***	0.29***	110***		-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	N	ND	2400			2.8	YES	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N	ND	11.2	38	12,378	0.56	YES	0.051J	240J	0.480J	0.450	ND	0.065J						
Acenaphthene	N	ND	740	7600		1.6	YES	0.053J	270J	9.3	0.660	ND	0.069J						
Acenaphthylene	N	ND	460***	10,800***			NO	ND	2.3J	0.210J	ND	0.042	ND	ND	ND	ND	ND	0.071J	0.058J
Alkanes	?	-					-	1J	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N	ND	4400	20000		42	YES	ND	32J	1.9	0.055J	0.160J	ND	ND	0.037J	ND	ND	0.180J	0.130J
Benzo(a)anthracene	C	ND	0.62	2.9	1,097	0.001	YES	0.120J	26J	1.9	0.037J	0.200J	ND	ND	0.190J	ND	ND	0.510	0.410
Benzo(a)pyrene	C	ND	0.062	0.29	110	0.000094	YES	0.120J	9.3J	1.5	0.031J	0.150J	ND	ND	0.140J	ND	0.041J	0.480	0.540
Benzo(b)fluoranthene	C	0.044J	0.62	2.9	1,097	0.00094	YES	0.220J	21J	3.3	0.120J	0.230J	0.052J	ND	0.420J	ND	0.052J	0.790J	1.6
Benzo(b,k)fluoranthene	C	0.260J	0.62	2.9	1,097	0.00094	YES	-	-	-	-	-	-	-	-	-	-	-	-
Benzo (g,h,i) Perylene	N	ND	460***	10,800***		4.2	YES	0.072J	3.3J	0.790	ND	0.110J	ND	ND	0.120J	ND	ND	0.540	0.470
Benzo(k)fluoranthene	C	-	6.2	29	10,989	0.0094	YES	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl	N	-	350	350			NO	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C	ND	24	120	40,019	0.068**	YES	ND	20J	0.190J	ND	0.039J	ND	ND	ND	ND	ND	ND	0.110J
Carboxylic Acids	?	-					-	-	-	2J	-	-	-	-	-	-	-	-	-
Chrysene	C	ND	62	290	109,894	0.01	YES	0.150J	25J	2.7	0.120J	0.270J	ND	ND	0.260J	ND	0.041J	0.680	0.850
Cresol (ortho)	N	ND	620	8800		1.8**	YES	-	-	-	-	-	-	-	-	-	-	-	-
Cresol m & p	N	ND	62	880		0.070	YES	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	C	-	0.062	0.29	110	0.000094	YES	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	N	ND	58	1020		0.56	YES	ND	82J	2.2	0.085J	ND	0.079J						
Fluoranthene	N	ND	460	6000		5.6	YES	0.130J	250J	8.2	0.160J	0.290J	0.085J	ND	0.390	ND	ND	0.640	0.850
Fluorene	N	ND	520	6600		5.6	YES	ND	170J	4.2	0.170J	ND	0.100J						
Indeno(1,2,3-cd)pyrene	C	ND	0.62	29	1,097	0.0094	YES	0.057J	3.3J	0.830	ND	0.094J	ND	ND	0.099J	ND	ND	0.420	0.440
Naphthalene	N	ND	11.2	38	12,378	0.42	YES	0.130J	360J	1.1	ND	0.150J							
Pentachlorophenol	C	-	3	11	59	0.006	YES	-	-	-	-	-	-	-	-	-	-	-	-
Perylene	?	-					NO	-	6JN	-	-	-	-	-	0.100JN	-	-	0.100JN	-
Phenanthrene	N	ND	460***	10,800***		4.2	YES	0.110J	470J	7.1	0.083J	0.110J	ND	ND	0.060J	ND	ND	0.300J	0.360J
Phenol	N	ND	7400	20000		6.0	YES	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N	0.049J	460	10800		4.2	YES	0.240J	80J	4.9J	0.097J	0.320J	0.064J	ND	0.350J	ND	ND	0.800J	0.990J
Tetrachlorophenols	N	-	360	5200		4.2	YES	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- USEPA Region 9 Preliminary Remediation Goals (PRGs)
- Cancer Risk = 1E-06 and Chronic HQ = 0.2
- ? No health data evaluation as to carcinogenicity.
- Exceeds Highest PRG.
- * Background Location
- ** GW standard based on Region 9 Tap Water Concentration
- Prot. GW = Protection of Groundwater = 20 X GW Standard
- N = Presumptive Evidence of Presence of Material.
- M = Landfarm 9 to 12 inches below surface
- L = Landfarm 21 to 24 inches below surface
- S = Substrate 6 inches below landfarm
- B = 6 inches above base of landfarm
- C = Substrate below landfarm
- *** Screening Value: Carcinogen = Benzo(a)pyrene PRG; Noncarcinogen = Pyrene PRG
- S-Spec. = Site Specific
- = Not Analyzed
- ND = Not Detected
- LF1 = Landfarm area 1
- LF2 = Landfarm area 2
- J = Estimated Value
- C = Carcinogen
- N = Non-carcinogen
- Res = Residential
- Ind = Industrial

TABLE 5-7. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWS-1B	TWS-2B	TWS-3B	TWS-4B	TWS-5B	TWS-6B	TWS-7B	TWS-8B	TWS-9B	TWS-10B	TWS-11B	TWS-12B	TWS-13B	TWSB1B	TWSB2B	
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/14/96	2/14/96
Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	C	ND	0.65	1.5	-	0.02	YES	ND															
Branched Alkane	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclic Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Benzene	N	ND	300	300	-	0.58	YES	ND															
Methyl Ethyl Ketone	N	ND	1460	5600	-	3.4	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylenes	N	ND	280	280	-	10.6	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWSB3B	TWSB4B	TWSB5B	TWSB6B	TWSB7B	TWSB8B	TWSB9B	TWSB10B	TWSB11B	TWSB12B	TWSB13B	TWSB14B	TWSB15B	PDA1B	PDA2B	
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96
Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	C	ND	0.65	1.5	-	0.02	YES	ND															
Branched Alkane	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclic Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Benzene	N	ND	300	300	-	0.58	YES	ND															
Methyl Ethyl Ketone	N	ND	1460	5600	-	3.4	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylenes	N	ND	280	280	-	10.6	YES	0.021	ND	ND	0.0074	ND											

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	PDA3B	PDA4B	PDA5B	PDA6B	PDA7B	PDA8B	PDA9B	PDA10B	PDA11B	SB-01*	SB-02	SB-03	SB-04	SB-05	SB-06	
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	C	ND	0.65	1.5	-	0.02	YES	ND															
Branched Alkane	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclic Alkanes	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Benzene	N	ND	300	300	-	0.58	YES	ND	0.22	ND													
Methyl Ethyl Ketone	N	ND	1460	5600	-	3.4	YES	-	-	-	-	-	-	-	-	ND	ND	0.044J	ND	0.030J	ND	ND	
Total Xylenes	N	ND	280	280	-	10.6	YES	ND	ND	ND	ND	0.0088	ND	0.0064	0.0081	0.64	ND	ND	ND	ND	ND	ND	

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	SB-07	SB-08	SB-09	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-17	SB-18	SB-19	SB-20	SB-21
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96	10/4/96
Alkanes	?	-	-	-	-	-	-	-	-	-	-	1J	-	-	-	-	-	-	-	-	-	-
Benzene	C	ND	0.65	1.5	-	0.02	YES	ND	0.078J	ND												
Branched Alkane	?	-	-	-	-	-	-	-	-	-	-	0.200J	-	-	-	-	-	-	-	-	-	-
Cyclic Alkanes	?	-	-	-	-	-	-	-	-	-	-	0.400J	-	-	-	-	-	-	-	-	-	-
Ethyl Benzene	N	ND	300	300	-	0.58	YES	0.021	0.630J	ND	ND	0.510	ND									
Methyl Ethyl Ketone	N	ND	1460	5600	-	3.4	YES	0.018J	0.071J	ND												
Total Xylenes	N	ND	280	280	-	10.6	YES	0.047	2.3J	ND	ND	0.910	ND									

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs)
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 [Exceeds Highest PRG...]
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence for Presence of Material.

J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

**TABLE 5-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg) Inorganics	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	1 Area B-4	1 Area B-5	1 Area B-6	1 Area B-7	LF1ALS	LF1BLS	LF1CLS	LF1DLS	LF1ELS	LF2ALS	LF2BLS	LF2CLS	LF2DLS	LF2ELS	
								6/83-9/83	6/83-9/83	6/83-9/83	6/83-9/83	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91	10/15/91
Aluminum	N	4,700	15,200	20,000		36**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	5.4	0.39	2.7	61	0.050	YES	24	2	85	24	23	13	4.9	15	9.9	18	84	14	22	9.5	
Barium	N	43		20,000		2.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.005	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,061	0.050	YES	ND	8	66.9	ND	14	7.9	5.4	1.9	2.8	12	100	9.8	21	15	
Cobalt	N	1.8J	940	20,000		2.2**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		1.0	YES	-	-	-	-	70	35	38	12	17	120	140	62	150	51	
Cyanide	N	-	2.2	7		0.154	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		11**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.015	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		0.88**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.0011	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		.260**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		2.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

S = Substrate 6 inches below landfarm

B = 6 inches above base of landfarm

C = Substrate below landfarm

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

¹ Area B - CCA Area

**TABLE 5-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg) Inorganics	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present in GW	LF1B 2/15/96	LF2B 2/15/96	LF1C 2/15/96	LF2C 2/15/96	TWS-1B 2/28/91	TWS-2B 2/28/91	TWS-3B 2/28/91	TWS-4B 2/28/91	TWS-5B 2/28/91	TWS-6B 2/28/91	TWS-7B 2/28/91	TWS-8B 2/28/91	TWS-9B 2/28/91	TWS-10B 2/28/91	TWS-11B 2/28/91	
Aluminum	N	4,700	15,200	20,000		36**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	5.4	0.39	2.7	61	0.050	YES	22	13	6.4	5.3	2	3.5	4.3	13	1.6	6.1	ND	ND	ND	6.1	2.2	
Barium	N	43		20,000		2.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.005	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,061	0.050	YES	2.6	1.5	ND	ND	4.8	6.1	3.8	29	4.1	27	3.2	1.2	2.2	4.2	3.7	
Cobalt	N	1.8J	940	20,000		2.2**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		1.0	YES	8.3	7.9	ND	ND	12	ND	ND	16	ND	3.9	ND	ND	4.4	110	ND	
Cyanide	N	-	2.2	7		0.154	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		11**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.015	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		0.88**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.0011	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		.260**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		2.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG. []

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

S = Substrate 6 inches below landfarm

B = 6 inches above base of landfarm

C = Substrate below landfarm

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

**TABLE 5-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWS-12B	TWS-13B	TWSB1B	TWSB2B	TWSB3B	TWSB4B	TWSB5B	TWSB6B	TWSB7B	TWSB8B	TWSB9B	TWSB10B	TWSB11B
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/28/91	2/28/91	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96
Aluminum	N	4,700	15,200	20,000		36**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	C	5.4	0.39	2.7	61	0.050	YES	1.6	ND	ND	ND	ND	21	1.2	5.3	ND	ND	6.5	ND	5.7
Barium	N	43		20,000		2.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.005	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,061	0.050	YES	6	1.8	1.9	1.3	13	21	2.1	5.2	1.1	4.2	3	3.7	1.7
Cobalt	N	1.8J	940	20,000		2.2**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		1.0	YES	4.2	ND	ND	ND	16	58	ND	12	ND	ND	4.8	ND	ND
Cyanide	N	-	2.2	7		0.154	NO	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		11**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.015	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	8,400		0.88**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.0011	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		.260**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		2.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

S = Substrate 6 inches below landfarm

B = 6 inches above base of landfarm

C = Substrate below landfarm

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

**TABLE 5-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	TWSB12B	TWSB13B	TWSB14B	TWSB15B	PDA1B	PDA2B	PDA3B	PDA4B	PDA5B	PDA6B	PDA7B	PDA8B	PDA9B	PDA10B	PDA11B	
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	2/14/96	
Aluminum	N	4,700	15,200	20,000		36**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Arsenic	C	5.4	0.39	2.7	61	0.050	YES	3.2	2.9	ND	3.9	110	ND	20	8.2	10	4	74	6.6	2.2	ND	-	
Barium	N	43		20,000		2.0	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N	ND	7.4	162		0.005	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?	4,800					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	10.9	30	64	1,061	0.050	YES	2.1	5.1	2.4	4.5	380	2.5	25	6.9	32	10	80	14	5.6	1.5	4.5	
Cobalt	N	1.8J	940	20,000		2.2**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	24	580	15,200		1.0	YES	ND	80	ND	30	120	3.1	14	57	38	9.2	110	25	30	ND	12	
Cyanide	N	-	2.2	7		0.154	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	6,600	4,600	20,000		11**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	100	400	400		0.015	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?	640					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N	65	360	6,400		0.88**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	N	ND	4.6	122		0.0011	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N	3.3J	320	8,200		0.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?	300					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?	270					YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N	12	110	2,800		.260**	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N	100	4,600	20,000		2.10	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

S = Substrate 6 inches below landfarm

B = 6 inches above base of landfarm

C = Substrate below landfarm

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

**TABLE 5-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	SB-01*	SB-02	SB-03	SB-04	SB-05	SB-06	SB-07	SB-08	SB-09	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-17
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98	10/4/98
Aluminum	N	4,700	15,200	20,000		36**	YES	770	2600	3700	1100	1100	1100	920	1600	13000	7400	1100	1800	2100	800	440	350	950
Arsenic	C	5.4	0.39	2.7	61	0.050	YES	2J	9.2J	ND	4.2J	ND	ND	ND	19	5.2	ND	2.9	4.2	ND	2.3	ND	ND	ND
Barium	N	43		20,000		2.0	YES	4.4	1.9	16	25	4.5	7.3	18	47	39	21	24	18	2.3	11	2	2.4	5.2
Cadmium	N	ND	7.4	162		0.005	YES	ND	0.96J	ND														
Calcium	?	4,800					YES	1,400J	170J	17000	490J	470	230	380	8700	820	800	970	13000	ND	230	41J	150	71
Chromium	C	10.9	30	64	1,061	0.050	YES	2.9	1.8J	10	3.4J	2.3J	2.8J	2.5	12	18	12	6.5	6.4	1.6J	3.4J	2.4J	1.5J	3.2
Cobalt	N	1.8J	940	20,000		2.2**	YES	ND	ND	1.5J	0.77J	ND	ND	0.75J	2.7J	6.2J	3.8J	ND						
Copper	N	24	580	15,200		1.0	YES	3.1J	4.2J	ND	30	ND	8J	ND	100	11	ND	7.9	12	ND	6.3J	ND	ND	ND
Cyanide	N	-	2.2	7		0.154	NO	ND	12	ND														
Iron	N	6,600	4,600	20,000		11**	YES	1,600J	720J	4000	3,600J	1600	1400	1900	17000	14000	7200	2600	2700	1300	2100	970J	570	1500
Lead	N	100	400	400		0.015	YES	1.6J	5.4J	15	180J	3.7	2.8J	7.4	110	14	3.8	58	38	2	8.1J	0.94J	1.3	2
Magnesium	?	640					YES	160	14J	1800	120	110	140J	96	420	1300	910	180	900	ND	ND	90	ND	150
Manganese	N	65	360	6,400		0.88**	YES	6	2.2J	24	26	8.1	ND	10	130	110	130	18	51	4.1	9.5J	5.1	ND	6.1
Mercury	N	ND	4.6	122		0.0011	YES	ND	ND	ND	0.48	ND	ND	ND	1	ND								
Nickel	N	3.3J	320	8,200		0.10	YES	ND	11	ND														
Potassium	?	300					YES	130	50J	450	180	220J	230	ND	ND	780	560J	170	ND	ND	210	170	ND	330J
Sodium	?	270					YES	65	ND	280	12J	ND	ND	ND	150	110	180	ND	620	ND	ND	ND	ND	ND
Vanadium	N	12	110	2,800		260**	YES	3.2J	2.1J	12J	3.7J	3.2J	3.1J	3.3J	8.7J	34	18	4.7J	6.1J	3.6J	3J	2.3J	1.7J	4.2J
Zinc	N	100	4,600	20,000		2.10	YES	5.9	ND	24	48	18	23	22	120	73	36	82	60	5.1	19	2.2J	8.6	9.2

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** GW standard based on Region 9 Tap Water Concentration

Prot. GW = Protection of Groundwater = 20 X GW Standard

N = Presumptive Evidence of Presence of Material.

S = Substrate 6 inches below landfarm

B = 6 inches above base of landfarm

C = Substrate below landfarm

J = Estimated Value

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

- = Not Analyzed

ND = Not Detected

**TABLE 5-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Prot.	Present	SB-18	SB-19	SB-20	SB-21
Inorganics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	GW PRG	In GW	10/4/96	10/4/96	10/4/96	10/4/96
Aluminum	N	4,700	15,200	20,000		36**	YES	440	340	2100	1100
Arsenic	C	5.4	0.39	2.7	61	0.050	YES	ND	ND	ND	ND
Barium	N	43		20,000		2.0	YES	0.99J	0.74J	6	5.9
Cadmium	N	ND	7.4	162		0.005	YES	ND	ND	ND	ND
Calcium	?	4,800					YES	170J	2.7J	550	460
Chromium	C	10.9	30	64	1,061	0.050	YES	ND	ND	5.8	6.1
Cobalt	N	1.8J	940	20,000		2.2**	YES	ND	ND	ND	ND
Copper	N	24	580	15,200		1.0	YES	ND	ND	ND	ND
Cyanide	N	-	2.2	7		0.154	NO	ND	ND	ND	ND
Iron	N	6,600	4,600	20,000		11**	YES	1,000J	840J	1900	1500
Lead	N	100	400	400		0.015	YES	7.4J	0.93J	2	2.6
Magnesium	?	640					YES	23	22	340	120
Manganese	N	65	360	6,400		0.88**	YES	4.1	4.4	10	8.8
Mercury	N	ND	4.6	122		0.0011	YES	ND	ND	ND	ND
Nickel	N	3.3J	320	8,200		0.10	YES	ND	ND	ND	ND
Potassium	?	300					YES	67	84	320	ND
Sodium	?	270					YES	ND	ND	120	ND
Vanadium	N	12	110	2,800		.260**	YES	ND	1.4J	5.1J	3.8J
Zinc	N	100	4,600	20,000		2.10	YES	3.6J	2.2J	7.7	15

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence of Presence of Material.
 S = Substrate 6 inches below landfarm
 B = 6 inches above base of landfarm
 C = Substrate below landfarm

J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

TABLE 5-9. PRELIMINARY REMEDIATION GOALS FOR DETECTED SUBSURFACE SOIL CONSTITUENTS - PESTICIDES AND PCBs
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg) Pesticides/PCBs	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	¹ Area B-4 6/83-9/83	¹ Area B-5 6/83-9/83	¹ Area B-6 6/83-9/83	¹ Area B-7 6/83-9/83	TWS-1B 2/28/91	TWS-2B 2/28/91	TWS-3B 2/28/91	TWS-4B 2/28/91	TWS-5B 2/28/91	TWS-6B 2/28/91	TWS-7B 2/28/91	TWS-8B 2/28/91	TWS-9B 2/28/91	TWS-10B 2/28/91	
4,4'-DDD (P,P'-DDD)	C	ND	ND	2.4	17		0.0028	YES***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE (P,P'-DDE)	C	ND	ND	1.7	12		0.002	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT (P,P'-DDT)	C	ND	ND	1.7	12		0.004**	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alpha-Chlordane/2	C/N	ND	ND	1.6	11		0.00054	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	C/N	ND	ND	0.03	0.15		0.000044	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I (Alpha)	N	ND	ND	74	1060		4.4**	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Parameters (mg/kg) Pesticides/PCBs	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWS-11B 2/14/96	TWS-12B 2/14/96	TWS-13B 2/28/91	TWSB1B 2/14/96	TWSB2B 2/14/96	TWSB3B 2/14/96	TWSB4B 2/14/96	TWSB5B 2/14/96	TWSB6B 2/14/96	TWSB7B 2/14/96	TWSB8B 2/14/96	TWSB9B 2/14/96	TWSB10B 2/14/96	TWSB11B 2/14/96	
4,4'-DDD (P,P'-DDD)	C	ND	ND	2.4	17		0.0028	YES***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE (P,P'-DDE)	C	ND	ND	1.7	12		0.002	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT (P,P'-DDT)	C	ND	ND	1.7	12		0.004**	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alpha-Chlordane/2	C/N	ND	ND	1.6	11		0.00054	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	C/N	ND	ND	0.03	0.15		0.000044	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I (Alpha)	N	ND	ND	74	1060		4.4**	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Parameters (mg/kg) Pesticides/PCBs	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	TWSB12B 2/14/96	TWSB13B 2/14/96	TWSB14B 2/14/96	TWSB15B 2/14/96	PDA1B 2/14/96	PDA2B 2/14/96	PDA3B 2/14/96	PDA4B 2/14/96	PDA5B 2/14/96	PDA6B 2/14/96	PDA7B 2/14/96	PDA8B 2/14/96	PDA9B 2/14/96	PDA10B 2/14/96	
4,4'-DDD (P,P'-DDD)	C	ND	ND	2.4	17		0.0028	YES***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE (P,P'-DDE)	C	ND	ND	1.7	12		0.002	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT (P,P'-DDT)	C	ND	ND	1.7	12		0.004**	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alpha-Chlordane/2	C/N	ND	ND	1.6	11		0.00054	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	C/N	ND	ND	0.03	0.15		0.000044	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I (Alpha)	N	ND	ND	74	1060		4.4**	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Parameters (mg/kg) Pesticides/PCBs	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	PDA11B 2/14/96	SB-01* 10/4/96	SB-02 10/4/96	SB-03 10/4/96	SB-04 10/4/96	SB-05 10/4/96	SB-06 10/4/96	SB-07 10/4/96	SB-08 10/4/96	SB-09 10/4/96	SB-10 10/4/96	SB-11 10/4/96	SB-12 10/4/96	SB-13 10/4/96	
4,4'-DDD (P,P'-DDD)	C	ND	ND	2.4	17		0.0028	YES***	-	ND	ND	0.044	0.02	ND	0.064	ND	ND						
4,4'-DDE (P,P'-DDE)	C	ND	ND	1.7	12		0.002	NO	-	ND	ND	0.035J	0.0063	ND	ND								
4,4'-DDT (P,P'-DDT)	C	ND	ND	1.7	12		0.004**	NO	-	ND	ND	0.0075JN	ND	ND									
Alpha-Chlordane/2	C/N	ND	ND	1.6	11		0.00054	NO	-	ND	ND	ND	ND	ND	ND	0.150JN	ND	ND	ND	ND	ND	ND	ND
Dieldrin	C/N	ND	ND	0.03	0.15		0.000044	NO	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.014N	ND
Endosulfan I (Alpha)	N	ND	ND	74	1060		4.4**	NO	-	ND	ND	0.0024N	ND	0.069J	ND	ND	ND	0.008	ND	ND	ND	0.023N	ND

Parameters (mg/kg) Pesticides/PCBs	C	N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Prot. GW PRG	Present In GW	SB-14 10/4/96	SB-15 10/4/96	SB-16 10/4/96	SB-17 10/4/96	SB-18 10/4/96	SB-19 10/4/96	SB-20 10/4/96	SB-21 10/4/96
4,4'-DDD (P,P'-DDD)	C	ND	ND	2.4	17		0.0028	YES***	ND							
4,4'-DDE (P,P'-DDE)	C	ND	ND	1.7	12		0.002	NO	ND							
4,4'-DDT (P,P'-DDT)	C	ND	ND	1.7	12		0.004**	NO	ND							
Alpha-Chlordane/2	C/N	ND	ND	1.6	11		0.00054	NO	ND							
Dieldrin	C/N	ND	ND	0.03	0.15		0.000044	NO	ND							
Endosulfan I (Alpha)	N	ND	ND	74	1060		4.4**	NO	ND	ND	ND	0.0054N	ND	ND	0.0032	0.017

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 Exceeds Highest PRG.
 * Background Location
 ** GW standard based on Region 9 Tap Water Concentration
 Prot. GW = Protection of Groundwater = 20 X GW Standard
 N = Presumptive Evidence for Presence of Material.
 YES*** Constituent detected but is below groundwater standard.

J = Estimated Value
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 - = Not Analyzed
 ND = Not Detected

¹Area B - CCA Area

**TABLE 5-10. SUBSURFACE SOIL - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Protect. GW PRG	Present in GW	TEF	*SS-2DF 2/19/01	SS-6DF 1/25/01	SS-13DF 1/25/01	SS-13DF-DUP 1/25/01	*SS-14DF 1/25/01	SS-17DF 1/25/01
2378-TCDD	C	1.91	4	27	1,200	0.0044	NO	1	1.91	ND	ND	ND	ND	ND
12378-PeCDD	C	2.1	8	54	2,400	0.0088	NO	0.5	2.1	9.42	0.558	ND	0.491	ND
123478-HxCDD	C	3.33	40	270	12,000	0.044	NO	0.1	3.33	47	0.908	0.651	ND	ND
123678-HxCDD	C	7.63	40	270	12,000	0.044	YES	0.1	7.63	463	1.77	1.42	1.76	ND
123789-HxCDD	C	6.48	40	270	12,000	0.044	YES	0.1	6.48	154	1.09	0.860	0.72	ND
1234678-HpCDD	C	244	400	2700	120,000	0.44	YES	0.01	244	8440	61.5	65.7	53.8	4.02
OCDD	C	8840	4,000	27,000	1,200,000	4.4	YES	0.001	8840	92900	5120	3730	693	54.1
2378-TCDF	C	6.09	40	270	12,000	0.044	NO	0.1	6.09	ND	0.38	ND	ND	ND
12378-PeCDF	C	3.54	80	540	24,000	0.088	YES	0.05	3.54	13.2	0.225	ND	0.456	0.363
23478-PeCDF	C	23.7	8	54	2,400	0.0088	YES	0.5	23.7	24	0.4	0.384	0.8	0.461
123478-HxCDF	C	4.94	40	270	12,000	0.044	YES	0.1	4.94	159	0.4	0.442	1.0	0.40
123678-HxCDF	C	8.06	40	270	12,000	0.044	YES	0.1	8.06	40.6	0.481	0.465	0.649	0.373
234678-HxCDF	C	15.6	40	270	12,000	0.044	YES	0.1	15.6	81.6	0.612	0.721	0.834	0.432
123789-HxCDF	C	ND	40	270	12,000	0.044	YES	0.1	ND	67	ND	ND	0.544	ND
1234678-HpCDF	C	58.2	400	2700	120,000	0.44	YES	0.01	58.2	16700	7.63	9.18	44.2	2.7
1234789-HpCDF	C	2.88	400	2700	120,000	0.44	YES	0.01	2.88	161	ND	ND	ND	ND
OCDF	C	81.9	4,000	27,000	1,200,000	4.4	YES	0.001	81.9	15000	20.6	25.4	50.2	2.39
Total TCDDs	C	56.4							56.4	ND	ND	ND	4.65	ND
Total PeCDDs	C	56.6							56.6	261	2.77	0.848	11.0	ND
Total HxCDDs	C	205							205	5190	19.1	23.6	27.1	1.56
Total HpCDDs	C	770							770	49400	180	237	256	11.1
Total TCDFs	C	172							172	31.8	ND	ND	1.62	ND
Total PeCDFs	C	255							255	172	0.372	0.384	4.86	0.824
Total HxCDFs	C	196							196	6930	6.11	6.74	22.8	1.88
Total HpCDFs	C	141							141	31500	21.1	26.0	88.3	4.99
Dilution Factor									1	1	1	1	1	1
2378-TCDD TEQ					1,200				32	480	7	5	3	0.49

NOTES:

All results are in parts per trillion (ppt) by U.S. EPA Method 1613.
 Sample collected 2 to 4 feet below land surface above the water table.
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.
 TEQ calculated using zero for not-detected (ND).
Italic results are Estimated Possible Maximum Concentrations (EMPC).
EMPC detection meets all QA/QC requirements except ion concentration.
Interferences may mask the result or constituent may or may not be present.

Cancer Risk=1E-06 & Chronic HQ=0 C = Carcinogen
Exceeds Highest PRG. N = Non-carcinogen
 SW = Surface Water Res = Residential
 - = Not Analyzed Ind = Industrial
 ND = Not Detected S-Spec. = Site Specific
 BKGD = Background *Background sample
 GW = Groundwater
 Protect = Protection of GW Goal = 20 times the GW standard.

TABLE 6-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters Extractable Organics (mg/L)	MDL	PRG	CW-1 6/1/83	CW-2 6/1/83	CW-3 6/1/83	CW-4 6/1/83	CW-5 6/1/83	AW-01 1/7/85	GW-1 1/7/85	GW-2 1/7/85	GW-4 1/7/85	GW-5 1/7/85	B-2 3/11/92	B-3 3/13/92	B-4 3/12/92	B-5 3/11/92	B-6 3/12/92
2,4-Dimethylphenol	0.00039	0.140	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	0.00024	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	0.00033	0.028	-	-	-	-	-	ND	ND	0.018	ND	ND	-	-	-	-	-
Acenaphthene	0.00025	0.080	-	-	-	-	-	ND	ND	0.04	0.032	ND	ND	ND	3	ND	0.022
Acenaphthylene	0.00033	0.210	-	-	-	-	-	ND	ND	ND	0.0009J	ND	-	-	-	-	-
Anthracene	0.00033	2.10	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.94	ND	ND
Benz(a)anthracene	0.00030	0.00005	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.42	ND	ND
Benzo(a)Pyrene	0.00041	0.000047	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
Benzo(b)Fluoranthene	0.00028	0.000047	-	-	-	-	-	-	-	-	-	-	ND	ND	0.21	ND	ND
Benzo(k)Fluoranthene	0.00072	0.00047	-	-	-	-	-	-	-	-	-	-	ND	ND	0.056	ND	ND
Benzo(g,h,i)Perylene	0.00068	0.210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-ethylhexyl)Phthalate	0.00048	0.003	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-
Carbazole	0.00054	0.0034**	-	-	-	-	-	-	-	-	-	-	ND	ND	0.36	ND	ND
Chrysene	0.00044	0.005	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.34	ND	ND
Cresol (o) (2-Methylphenol)	0.00029	0.18**	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-
Cresol (m&p) (3&4-Methylphenol)	0.00071	0.0035	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND
Dibenzo(a,h)Anthracene	0.00080	0.000047	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.011	ND	ND
Dibenzofuran	0.00029	0.028	-	-	-	-	-	ND	ND	0.014	ND	ND	-	-	-	-	-
Di-n-butyl Phthalate	0.00026	0.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	0.00033	0.280	-	-	-	-	-	ND	ND	ND	0.0078	ND	ND	ND	2.7	ND	ND
Fluorene	0.00038	0.280	-	-	-	-	-	ND	ND	0.015	0.0007J	ND	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	0.00056	0.000047	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.035	ND	ND
Naphthalene	0.00036	0.021	ND	ND	ND	ND	ND	ND	ND	0.29	ND	ND	ND	ND	14	ND	0.052
Pentachlorophenol	0.0040	0.0003	0.001	0.18	0.003	0.007	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.00033	0.210	ND	0.008	ND	ND	ND	ND	ND	0.0078	0.0005	ND	ND	ND	5.8	ND	ND
Phenol	0.00028	0.30	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.00053	0.210	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-
Tetrachlorophenols	0.00061	0.210	ND	0.1	ND	ND	0.005	-	-	-	-	-	ND	ND	ND	ND	ND

Note:

- Background Location
 - J Estimated Value
 - N Presumptive Evidence for Presence of Material.
 - ND Not Detected
 - MDL Method Detection Limit
 - PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
 - ** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.
- Must calculate Interim 2L Standards for Carbazole and 2-Methylphenol (o-Cresol).
Exceeds Highest PRG

TABLE 6-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters Extractable Organics (mg/L)	MDL	PRG	MW-6 2/13/01	MW-7 2/13/01	MW-8 11/14/96	MW-8 2/13/01	MW-8-Dup 2/13/01	MW-9 2/13/01	MW-10 2/13/01	MW-11 11/14/96	MW-12 2/15/01	MW-13 2/14/01	MW-15 11/14/96	MW-15 2/15/01	MW-16 11/14/96	MW-16 2/14/01	MW-17 11/14/96	MW-17 2/14/01
2,4-Dimethylphenol	0.00039	0.140	ND	ND	ND	ND	ND	ND	ND	0.220J	0.15	ND	0.016	0.021J	ND	ND	ND	ND
2-Chlorophenol	0.00024	0.0001	ND	ND	-	ND	ND	ND	ND	-	0.0012J	ND	-	ND	-	ND	-	ND
2-Methylnaphthalene	0.00033	0.028	ND	ND	ND	ND	ND	ND	ND	0.067	0.15	0.22	0.048	0.2	ND	ND	ND	ND
Acenaphthene	0.00025	0.080	ND	ND	ND	ND	ND	ND	ND	0.720J	0.16	0.38	0.14	0.15	ND	ND	0.01	0.0052J
Acenaphthylene	0.00033	0.210	-	-	ND	-	-	-	-	0.034	-	-	0.002J	-	ND	-	ND	-
Anthracene	0.00033	2.10	ND	ND	ND	ND	ND	ND	ND	0.990J	0.012	0.0073J	0.004J	0.0026J	0.001J	ND	0.003J	ND
Benz(a)anthracene	0.00030	0.00005	ND	ND	ND	ND	ND	ND	ND	0.220J	ND	ND	ND	ND	ND	0.0043J	ND	0.0040J
Benzo(a)Pyrene	0.00041	0.0000047	ND	ND	ND	ND	ND	ND	ND	0.067	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	0.00028	0.000047	ND	ND	-	ND	ND	ND	ND	0.145J	0.00069J	0.0038J	ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene	0.00072	0.00047	ND	ND	-	ND	ND	ND	ND	-	0.00079J	ND	-	ND	-	ND	-	ND
Benzo(g,h,i)Perylene	0.00068	0.210	ND	ND	ND	ND	ND	ND	ND	0.019	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)Phthalate	0.00048	0.003	ND	ND	ND	0.00083J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	0.00054	0.0034**	ND	ND	ND	ND	ND	ND	ND	1.6J	0.038	0.11	0.009J	0.043J	ND	ND	ND	ND
Chrysene	0.00044	0.005	ND	ND	ND	ND	ND	ND	ND	0.220J	0.0019J	0.048J	ND	0.0052J	ND	0.0095J	ND	0.0092J
Cresol (o) (2-Methylphenol)	0.00029	0.18**	ND	ND	ND	ND	ND	ND	ND	0.530J	0.07	ND	ND	ND	ND	ND	ND	ND
Cresol (m&p) (3&4-Methylphenol)	0.00071	0.0035	ND	ND	ND	ND	ND	ND	ND	0.890J	0.12	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)Anthracene	0.00080	0.0000047	ND	ND	-	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	-	ND
Dibenzofuran	0.00029	0.028	ND	ND	ND	ND	ND	ND	ND	0.540J	0.11	0.19	0.05	0.073	ND	ND	0.002J	0.0010J
Di-n-butyl Phthalate	0.00026	0.70	ND	ND	-	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	-	0.00079J
Fluoranthene	0.00033	0.280	ND	ND	ND	ND	ND	ND	ND	3.0J	0.031	0.0051J	ND	ND	ND	ND	0.002J	0.00092J
Fluorene	0.00038	0.280	ND	ND	ND	ND	ND	ND	ND	0.660J	0.12	0.15	0.029	0.057	ND	ND	0.009J	0.0048J
Indeno(1,2,3-cd)Pyrene	0.00056	0.000047	ND	ND	ND	ND	ND	ND	ND	0.022	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	0.00036	0.021	ND	ND	ND	ND	ND	ND	ND	0.085J	0.27	1.7	0.38	0.88	ND	ND	ND	ND
Pentachlorophenol	0.0040	0.0003	ND	ND	-	ND	ND	ND	ND	-	0.016J	ND	-	ND	-	ND	-	ND
Phenanthrene	0.00033	0.210	ND	ND	ND	ND	ND	ND	ND	4.8J	0.15	0.091J	0.015	0.028J	ND	ND	0.002J	ND
Phenol	0.00028	0.30	ND	ND	ND	ND	ND	ND	ND	0.210J	0.048	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.00053	0.210	ND	ND	ND	ND	ND	ND	ND	0.570J	0.016	ND	ND	ND	ND	ND	0.002J	ND
Tetrachlorophenols	0.00061	0.210	ND	ND	-	ND	ND	ND	ND	-	0.014	ND	-	ND	-	ND	-	ND

**TABLE 6-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Extractable Organics (mg/L)	MDL	PRG	MW-18 2/14/01	MW-19 2/15/01	MW-20 11/14/98	MW-20 2/13/01	MW-21 2/13/01	MW-23 2/13/01	MW-24R 11/14/98	MW-24R 2/15/01	MW-25 11/14/98	MW-25 2/14/01	MW-27 11/14/98	MW-27 2/13/01	MW-28 11/14/98	MW-28 2/14/01	MW-29 11/14/98	MW-29 2/15/01
2,4-Dimethylphenol	0.00039	0.140	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	0.00024	0.0001	ND	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND
2-Methylnaphthalene	0.00033	0.028	ND	0.0067J	ND	ND	ND	ND	ND	0.037	0.001J	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	0.00025	0.080	ND	0.17	0.014	0.03	ND	ND	0.2	0.17	0.009J	0.0037J	0.001J	ND	0.017	0.0078J	ND	ND
Acenaphthylene	0.00033	0.210	-	-	ND	-	-	-	ND	-	ND	-	ND	-	ND	-	ND	-
Anthracene	0.00033	2.10	ND	0.0022J	0.001J	ND	ND	ND	ND	ND	0.006J	0.0026J	ND	ND	ND	0.00049J	ND	ND
Benz(a)anthracene	0.00030	0.00005	0.00098J	0.00032J	ND	ND	ND	ND	ND	0.00043J	ND	0.0025J	ND	ND	ND	0.0012J	ND	0.0011J
Benzo(a)Pyrene	0.00041	0.0000047	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00051J	ND	ND	ND	ND	ND	0.0011J
Benzo(b)Fluoranthene	0.00028	0.000047	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00074J
Benzo(k)Fluoranthene	0.00072	0.00047	ND	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	0.0011J
Benzo(g,h,i)Perylene	0.00068	0.210	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0025J
Bis(2-ethylhexyl)Phthalate	0.00048	0.003	0.0014J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0014J	ND	ND
Carbazole	0.00054	0.0034**	ND	0.0016J	ND	ND	ND	ND	ND	0.013	ND	ND	ND	ND	ND	ND	ND	0.0011J
Chrysene	0.00044	0.005	0.0011J	ND	ND	ND	ND	ND	ND	ND	0.001J	0.0051J	ND	ND	ND	0.0013J	ND	0.0012J
Cresol (o) (2-Methylphenol)	0.00029	0.18**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cresol (m&p) (3&4-Methylphenol)	0.00071	0.0035	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)Anthracene	0.00080	0.0000047	ND	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	0.0024J
Dibenzofuran	0.00029	0.028	ND	0.0080J	ND	ND	ND	ND	0.041J	0.045	0.005J	0.0021J	ND	ND	0.006J	0.00043J	ND	ND
Di-n-butyl Phthalate	0.00026	0.70	ND	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	0.00048J	-	0.00026J
Fluoranthene	0.00033	0.280	ND	0.0015J	0.001J	ND	ND	ND	ND	0.00088J	0.012	0.0058J	ND	ND	0.002J	0.0015J	ND	0.0011J
Fluorene	0.00038	0.280	ND	0.036	0.001J	ND	ND	ND	0.072J	0.058	0.008J	0.0033J	ND	ND	0.013	0.0073J	ND	ND
Indeno(1,2,3-cd)Pyrene	0.00056	0.000047	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0025J
Naphthalene	0.00036	0.021	ND	0.14	ND	ND	ND	ND	ND	0.033	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	0.0040	0.0003	ND	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Phenanthrene	0.00033	0.210	ND	0.024	ND	ND	ND	ND	0.022J	0.022	0.017	0.0045J	ND	ND	0.003J	0.0068J	ND	ND
Phenol	0.00028	0.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.00053	0.210	ND	0.00079J	ND	ND	ND	ND	ND	ND	0.008J	0.0040J	ND	ND	0.001J	0.0010J	ND	0.0011J
Tetrachlorophenols	0.00061	0.210	ND	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND

TABLE 6-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters Extractable Organics (mg/L)	MDL	PRG	MW-30 2/13/01	MW-31 11/14/96	MW-31 2/13/01	MW-34 11/14/96	MW-34 2/15/01	MW-37* 11/14/96	MW-37* 2/14/01	MW-37-Dup* 2/14/01	MW-40 11/14/96	MW-40 2/14/01
2,4-Dimethylphenol	0.00039	0.140	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	0.00024	0.0001	ND	-	ND	-	ND	-	ND	ND	-	ND
2-Methylnaphthalene	0.00033	0.028	ND	ND	ND	ND	0.00048J	0.005J	ND	ND	ND	ND
Acenaphthene	0.00025	0.080	0.012	ND	ND	0.25	0.064	0.051	0.06	0.057	ND	ND
Acenaphthylene	0.00033	0.210	-	ND	-	ND	-	ND	-	-	ND	-
Anthracene	0.00033	2.10	ND	ND	ND	0.016J	0.0016J	ND	ND	ND	0.002J	ND
Benz(a)anthracene	0.00030	0.00005	ND	ND	ND	ND	0.0012J	ND	0.0023J	0.0022J	ND	0.0016J
Benzo(a)Pyrene	0.00041	0.0000047	ND	ND	ND	ND	ND	ND	0.0010J	0.00085J	ND	ND
Benzo(b)Fluoranthene	0.00028	0.000047	ND	ND	ND	ND	ND	ND	0.00089J	0.00042J	ND	ND
Benzo(k)Fluoranthene	0.00072	0.00047	ND	-	ND	-	ND	-	0.00097J	0.00080J	-	ND
Benzo(g,h,i)Perylene	0.00068	0.210	ND	ND	ND	ND	0.00070J	ND	0.0076J	ND	ND	ND
Bis(2-ethylhexyl)Phthalate	0.00048	0.003	ND	ND	ND	0.068	ND	ND	ND	ND	ND	0.0018J
Carbazole	0.00054	0.0034**	ND	ND	ND	ND	0.00077J	0.001J	ND	ND	ND	ND
Chrysene	0.00044	0.005	ND	ND	ND	ND	0.0012J	ND	0.0050J	0.0049J	ND	0.0015J
Cresol (o) (2-Methylphenol)	0.00029	0.18**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cresol (m&p) (3&4-Methylphenol)	0.00071	0.0035	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)Anthracene	0.00080	0.0000047	ND	-	ND	-	ND	-	ND	ND	-	ND
Dibenzofuran	0.00029	0.028	ND	ND	ND	0.15	0.0030J	ND	ND	ND	ND	ND
Di-n-butyl Phthalate	0.00026	0.70	ND	-	ND	-	ND	-	ND	0.00043J	-	0.00049J
Fluoranthene	0.00033	0.280	ND	ND	ND	0.036J	0.011	ND	0.00035J	ND	ND	ND
Fluorene	0.00038	0.280	ND	ND	ND	0.2	0.014	0.007J	0.0036J	0.0033J	ND	ND
Indeno(1,2,3-cd)Pyrene	0.00056	0.000047	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	0.00036	0.021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	0.0040	0.0003	ND	-	ND	-	ND	-	ND	ND	-	ND
Phenanthrene	0.00033	0.210	ND	ND	ND	0.23	0.0064J	0.003J	ND	ND	ND	0.0024J
Phenol	0.00028	0.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.00053	0.210	ND	ND	ND	0.022J	0.0061J	ND	ND	ND	ND	ND
Tetrachlorophenols	0.00061	0.210	ND	-	ND	-	ND	-	ND	ND	-	ND

**TABLE 6-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Purgeable Organics (mg/L)	MDL	PRG	*AW-01 1/7/85	GW-1 1/7/85	GW-2 1/7/85	GW-4 1/7/85	GW-5 1/7/85	B-2 3/11/92	B-3 3/13/92	B-4 3/12/92	B-5 3/11/92	B-6 3/12/92	MW-6 2/13/01	MW-7 2/13/01	MW-8 11/14/98	MW-8 2/13/01	MW-8-Dup 2/13/01	MW-9 2/13/01
1,1,1-Trichloroethane		0.002	0.014	ND	-	-	-	-	-	-								
1,1,2,2-Tetrachloroethane		0.00017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-
1,1-Dichloroethene		0.007	0.0066	ND	-	-	-	-	-	-								
1,2-Dichloroethane		0.00038	0.055	ND	-	-	-	-	-	-								
Acetone	0.0099	0.70	ND	ND	0.5	1	ND	-	-	-	-	-	ND	ND	-	ND	ND	ND
Benzene	0.00027	0.001	ND	0.0003J	0.0003J	ND	ND	ND	ND	ND	ND							
Bromodichloroethane			0.06	ND	-	-	-	-	-	-								
Bromoform		0.00019	0.014	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride		0.0003	0.038	ND	-	-	-	-	-	-								
Chlorobenzene		0.050	0.026	ND	-	-	-	-	-	-								
Chloroform (Trichloromethane)		0.00019	0.063	ND	-	-	-	-	-	-								
Chloromethylpropane			-	-	0.003JN	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorobromomethane		0.0006	0.038	ND	-	-	-	-	-	-								
Dichloromethane (Methylene Chloride)	0.00031	0.005	0.037	0.007J	0.007J	ND	0.023	ND	ND	ND	ND	ND	0.00049J	0.00038J	ND	ND	ND	ND
Ethyl Benzene	0.00083	0.029	ND	0.003J	0.0051	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)		0.170	ND	0.005J	ND	ND	0.026	-	-	-	-	-	-	-	ND	-	-	-
Propene			-	0.800JN	0.100JN	0.090JN	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene		0.0007	0.081	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	-
Toluene	0.00051	1.0	ND	ND	0.005J	0.016	ND	ND	ND	ND	ND	ND						
Total Xylenes	0.0019	0.530	-	-	-	-	-	-	-	0.13	-	-	ND	ND	ND	ND	ND	ND
Trichloroethene		0.0028	0.015	ND	-	-	-	-	-	-								

Note:

- Background Location
 - J Estimated Value
 - N Presumptive Evidence for Presence of Material.
 - ND Not Detected
 - MDL Method Detection Limit
 - PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
 - ** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.
- Must calculate Interim 2L Standards for Carbazole and 2-Methylphenol (o-Cresol).
Exceeds Highest PRG

AW-01 - Artesian wells in Greenfield Park
CW-1 is same well as GW-1, as is CW-2 is GW-2, etc.
Different identification used by different investigators.

**TABLE 6-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Purgeable Organics (mg/L)	MDL	PRG	MW-10 2/13/01	MW-11 11/14/98	MW-12 2/15/01	MW-13 2/14/01	MW-15 11/14/98	MW-15 2/15/01	MW-16 11/14/98	MW-16 2/14/01	MW-17 11/14/98	MW-17 2/14/01	MW-18 2/14/01	MW-19 2/15/01	MW-20 11/14/98	MW-20 2/13/01	MW-21 2/13/01
1,1,1-Trichloroethane		0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane		0.00017	-	ND	-	-	-	-	ND	-	0.006J	-	-	-	ND	-	-
1,1-Dichloroethene		0.007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane		0.00038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	0.0099	0.70	ND	-	ND	0.012J	-	ND	-	ND	-	ND	ND	ND	-	ND	ND
Benzene	0.00027	0.001	ND	0.13	0.0028J	0.014	ND	0.0045J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloroethane			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform		0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride		0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene		0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)		0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethylpropane			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorobromomethane		0.0006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	0.00031	0.005	ND	ND	ND	ND	ND	ND	ND	ND	0.017	ND	ND	ND	ND	0.0010J	ND
Ethyl Benzene	0.00083	0.029	ND	0.13	0.00089J	0.029	0.006J	0.014	ND	ND	ND	ND	0.0019J	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)		0.170	-	ND	-	-	ND	-	ND	-	0.015	-	-	-	ND	-	-
Propene			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene		0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	0.00051	1.0	ND	0.16	0.0022J	0.0024J	ND	0.0029J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.0019	0.530	ND	0.25	ND	0.030	0.009J	0.019	ND	ND	ND	ND	0.00092J	ND	ND	ND	ND
Trichloroethene		0.0028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 6-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters Purgeable Organics (mg/L)	MDL	PRG	MW-23 2/13/01	MW-24R 11/14/96	MW-24R 2/15/01	MW-25 11/14/96	MW-25 2/14/01	MW-27 11/14/96	MW-27 2/13/01	MW-28 11/14/96	MW-28 2/14/01	MW-29 11/14/96	MW-29 2/15/01	MW-30 2/13/01	MW-31 11/14/96	MW-31 2/13/01
1,1,1-Trichloroethane		0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane		0.00017	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-
1,1-Dichloroethene		0.007	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane		0.00038	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	0.0099	0.70	ND	-	ND	-	0.011J	-	ND	-	ND	-	ND	ND	-	ND
Benzene	0.00027	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloroethane		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform		0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride		0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene		0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)		0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethylpropane		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorobromomethane		0.0006	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	0.00031	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00059J	ND	0.00059J
Ethyl Benzene	0.00083	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)		0.170	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-
Propene		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene		0.0007	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	0.00051	1.0	ND	ND	ND	ND	ND	ND	0.0021J	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.0019	0.530	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.0028	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**TABLE 6-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Purgeable Organics (mg/L)	MDL	PRG	MW-34 11/14/96	MW-34 2/15/01	MW-37* 11/14/96	MW-37* 2/14/01	MW-37-Dup* 2/14/01	MW-40 11/14/96	MW-40 2/14/01
1,1,1-Trichloroethane		0.002	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane		0.00017	ND	-	ND	-	-	ND	-
1,1-Dichloroethene		0.007	-	-	-	-	-	-	-
1,2-Dichloroethane		0.00038	-	-	-	-	-	-	-
Acetone	0.0099	0.70	-	ND	-	ND	ND	-	0.014J
Benzene	0.00027	0.001	ND	ND	ND	ND	ND	ND	ND
Bromodichloroethane		-	-	-	-	-	-	-	-
Bromoform		0.00019	-	-	-	-	-	-	-
Carbon Tetrachloride		0.0003	-	-	-	-	-	-	-
Chlorobenzene		0.050	-	-	-	-	-	-	-
Chloroform (Trichloromethane)		0.00019	-	-	-	-	-	-	-
Chloromethylpropane		-	-	-	-	-	-	-	-
Dichlorobromomethane		0.0006	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	0.00031	0.005	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	0.00083	0.029	ND	ND	0.001J	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)		0.170	ND	-	ND	-	-	ND	-
Propene		-	-	-	-	-	-	-	-
Tetrachloroethene		0.0007	-	-	-	-	-	-	-
Toluene	0.00051	1.0	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.0019	0.530	ND	ND	0.002J	ND	ND	ND	ND
Trichloroethene		0.0028	-	-	-	-	-	-	-

**TABLE 6-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Inorganics (mg/L)	BKGD	MDL	PRG	CW-1 6/1/83	CW-2 6/1/83	CW-3 (LT) 6/1/83	CW-4 6/1/83	CW-5 6/1/83	AW-01 1/7/85	GW-1 1/7/85	GW-2 1/7/85	GW-4 1/7/85	GW-5 1/7/85	B-2 3/11/92	B-3 3/13/92	B-4 3/12/92	B-5 3/11/92	B-6 3/12/92	MW-6 2/13/01	MW-7 2/13/01
Aluminum	0.78		3.6**	-	-	-	-	-	ND	4.8	7.1	3.5	5.7	-	-	-	-	-	-	-
Arsenic (Total)	ND	0.0032	0.050	0.04	0.04	0.005	0.06	0.01	ND	ND	0.022	0.044	ND	0.11	0.049	0.031	ND	0.051	ND	ND
Arsenic (Dissolved)	-	0.0032	0.050	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-
Barium	0.034		2.0	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	-	-
Cadmium	ND		0.005	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	-	-
Calcium	67			-	-	-	-	-	43	80	35	66	42	-	-	-	-	-	-	-
Chromium (Total)	0.011	0.0017	0.050	ND	ND	0.05	0.04	ND	ND	ND	ND	ND	0.02	0.1	0.095	0.19	0.006	0.066	ND	0.0035B
Chromium (Dissolved)	-	0.0017	0.050	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-
Cobalt	ND		0.22**	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	-	-
Copper (Total)	0.0033B	0.00090	1.0	0.01	ND	0.08	0.03	ND	ND	ND	ND	ND	ND	0.05	0.085	0.13	0.014	0.056	0.0018B	ND
Copper (Dissolved)	-	0.00090	1.0	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	0.0064	ND	-	-
Iron	-		1.1**	-	-	-	-	-	ND	91	46	17	5.3	-	-	-	-	-	69	23
Lead (Total)	-		0.015	-	-	-	-	-	ND	0.014	0.012	0.016	ND	0.35	0.12	0.21	0.01	0.1	0.032	ND
Lead (Dissolved)	-		0.015	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-
Magnesium	-			-	-	-	-	-	ND	48	8	160	ND	-	-	-	-	-	18	22
Manganese	-		0.088**	-	-	-	-	-	ND	2	1.1	0.3	ND	-	-	-	-	-	2	1.8
Mercury	-		0.0011	-	-	-	-	-	ND	0.0002	ND	ND	ND	-	-	-	-	-	0.00042	ND
Nickel	-		0.10	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	ND	ND
Potassium	-			-	-	-	-	-	ND	14	6	49	ND	-	-	-	-	-	15	11
Selenium	-		0.050	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	ND	ND
Sodium	-			-	-	-	-	-	6	230	9	1400	15	-	-	-	-	-	33	140
Vanadium	-		0.026**	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-	0.030J	ND
Zinc	-		2.10	-	-	-	-	-	ND	0.04	0.06	0.04	ND	-	-	-	-	-	0.092	0.034

Note:

* Background Location

B Estimated Value

ND Not Detected

- Not-Analyzed

MDL Method Detection Limit

PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)

[Exceeds Highest PRG]

** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.

TABLE 6-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters Inorganics (mg/L)	BKGD	MDL	PRG	MW-8 2/13/01	MW-8-Dup 2/13/01	MW-9 2/13/01	MW-10 2/13/01	MW-11 11/14/96	MW-12 2/15/01	MW-13 2/14/01	MW-15 11/14/96	MW-15 2/15/01	MW-16 11/14/96	MW-16 2/14/01	MW-17 11/14/96	MW-17 2/14/01	MW-18 2/14/01	MW-19 2/15/01
Aluminum	0.78		3.6**	-	-	-	-	7.7	-	-	ND	-	ND	-	ND	-	-	-
Arsenic (Total)	ND	0.0032	0.050	ND	ND	0.025	0.045	0.012	0.0088B	0.0040B	0.068	0.33	ND	ND	0.01	0.0058B	0.032	0.0034B
Arsenic (Dissolved)	-	0.0032	0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-
Barium	0.034		2.0	-	-	-	-	0.17	-	-	0.094	-	0.044	-	0.15	-	-	-
Cadmium	ND		0.005	-	-	-	-	ND	-	-	ND	-	ND	-	ND	-	-	-
Calcium	67			-	-	-	-	78	-	-	91	-	9.1	-	32	-	-	-
Chromium (Total)	0.011	0.0017	0.050	0.0075B	0.0049B	0.0024B	0.0026B	0.015	ND	0.013	0.009J	0.0067B	0.006J	0.0030B	ND	ND	6.7	0.0051B
Chromium (Dissolved)	-	0.0017	0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	0.010	-
Cobalt	ND		0.22**	-	-	-	-	0.007J	-	-	ND	-	ND	-	ND	-	-	-
Copper (Total)	0.0033B	0.00090	1.0	0.0031B	0.0031B	0.0012B	0.0098B	0.051	0.0026B	0.0032	ND	0.0098B	ND	0.0026B	ND	0.0080B	0.16	0.0031B
Copper (Dissolved)	-	0.00090	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-		1.1**	2.3	17	73	61	7.2	76	37	8.6	39	25	16	3.3	-	-	-
Lead (Total)	-		0.015	ND	ND	ND	ND	0.003	ND	0.008	ND	ND	ND	ND	0.008	-	-	-
Lead (Dissolved)	-		0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	-			4.5	11	39	33	13	9.6	36	8.1	53	14	4.9	5.7	-	-	-
Manganese	-		0.088**	0.063	0.4	2.2	3.6	0.25	1.2	0.63	0.64	1.4	0.61	0.34	0.16	-	-	-
Mercury	-		0.0011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Nickel	-		0.10	ND	ND	ND	ND	ND	ND	ND	0.012J	ND	0.017J	0.007J	0.019J	-	-	-
Potassium	-			6	10	17	8.9	5.7	4.1	14	6.7	9.9	6.4	2.9	4.4	-	-	-
Selenium	-		0.050	ND	ND	ND	ND	ND	ND	ND	0.003J	ND	ND	0.004J	ND	-	-	-
Sodium	-			44	120	220	130	140	14	250	11	420	89	22	15	-	-	-
Vanadium	-		0.026**	ND	ND	0.019J	ND	ND	ND	ND	0.004J	ND	0.011J	0.005J	0.002J	-	-	-
Zinc	-		2.10	0.045	ND	ND	ND	0.021J	0.027J	ND	0.027J	0.016J	0.009J	0.014J	0.011J	-	-	-

Note:

* Background Location

B Estimated Value

ND Not Detected

- Not-Analyzed

MDL Method Detection Limit

PRG Preliminary Remediation Goal (Lower of NC

Exceeds Highest PRG)

** USEPA Region 9 PRG tap water concentrati

**TABLE 6-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Inorganics (mg/L)	BKGD	MDL	PRG	MW-20 11/14/96	MW-20 2/13/01	MW-21 2/13/01	MW-23 2/13/01	MW-24R 11/14/96	MW-24R 2/15/01	MW-25 11/14/96	MW-25 2/14/01	MW-27 11/14/96	MW-27 2/13/01	MW-28 11/14/96	MW-28 2/14/01	MW-29 11/14/96	MW-29 2/15/01	MW-30 2/13/01
Aluminum	0.78		3.6**	0.7	-	-	-	0.14	-	2.2	-	0.064	-	0.17	-	0.76	-	-
Arsenic (Total)	ND	0.0032	0.050	ND	ND	ND	0.0055B	ND	ND	ND	ND	ND	ND	ND	0.0039B	ND	0.0061B	ND
Arsenic (Dissolved)	-	0.0032	0.050	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-
Barium	0.034		2.0	0.19	-	-	-	0.32	-	0.047	-	0.24	-	0.28	-	0.14	-	-
Cadmium	ND		0.005	ND	-	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	-
Calcium	67			63	-	-	-	88	-	14	-	89	-	140	-	42	-	-
Chromium (Total)	0.011	0.0017	0.050	ND	0.0026B	ND	0.0047B	ND	ND	0.0039	0.0072B	ND	0.0031B	ND	0.0035B	0.07	0.029	0.0082B
Chromium (Dissolved)	-	0.0017	0.050	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-
Cobalt	ND		0.22**	ND	-	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	-
Copper (Total)	0.0033B	0.00090	1.0	ND	0.092	ND	0.0027B	ND	0.0017B	ND	0.0040B	ND	0.0016B	ND	0.0073B	ND	0.0045B	0.0014B
Copper (Dissolved)	-	0.00090	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-		1.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Total)	-		0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Dissolved)	-		0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-		0.088**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	-		0.0011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-		0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	-		0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-		0.026**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-		2.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note:

* Background Location

B Estimated Value

ND Not Detected

- Not-Analyzed

MDL Method Detection Limit

PRG Preliminary Remediation Goal (Lower of NC

Exceeds Highest PRG)

** USEPA Region 9 PRG tap water concentrati

**TABLE 6-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SHALLOW GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters Inorganics (mg/L)	BKGD	MDL	PRG	MW-31 11/14/96	MW-31 2/13/01	MW-34 11/14/96	MW-34 2/15/01	MW-37* 11/14/96	MW-37* 2/14/01	MW-37-Dup* 2/14/01	MW-40 11/14/96	MW-40 2/14/01
Aluminum	0.78		3.6**	0.23	-	0.73	-	0.78	-	-	0.38	-
Arsenic (Total)	ND	0.0032	0.050	ND	ND	ND	ND	ND	ND	ND	0.22	0.12
Arsenic (Dissolved)	-	0.0032	0.050	-	-	-	-	-	-	-	-	0.085
Barium	0.034		2.0	0.047	-	0.044	-	0.034	-	-	0.085	-
Cadmium	ND		0.005	0.001J	-	ND	-	ND	-	-	ND	-
Calcium	67			45	-	19	-	67	-	-	53	-
Chromium (Total)	0.011	0.0017	0.050	0.004J	0.0020B	0.003J	0.0023B	0.002J	0.011	0.011	0.003J	ND
Chromium (Dissolved)	-	0.0017	0.050	-	-	-	-	-	-	-	-	ND
Cobalt	ND		0.22**	ND	-	0.001J	-	ND	-	-	0.005J	-
Copper (Total)	0.0033B	0.00090	1.0	0.002J	ND	0.003J	0.0033B	ND	0.0033B	0.0014B	0.027	0.0016B
Copper (Dissolved)	-	0.00090	1.0	-	-	-	-	-	-	-	-	-
Iron	-		1.1**	-	-	-	-	-	-	-	-	-
Lead (Total)	-		0.015	-	-	-	-	-	-	-	-	-
Lead (Dissolved)	-		0.015	-	-	-	-	-	-	-	-	-
Magnesium	-			-	-	-	-	-	-	-	-	-
Manganese	-		0.088**	-	-	-	-	-	-	-	-	-
Mercury	-		0.0011	-	-	-	-	-	-	-	-	-
Nickel	-		0.10	-	-	-	-	-	-	-	-	-
Potassium	-			-	-	-	-	-	-	-	-	-
Selenium	-		0.050	-	-	-	-	-	-	-	-	-
Sodium	-			-	-	-	-	-	-	-	-	-
Vanadium	-		0.026**	-	-	-	-	-	-	-	-	-
Zinc	-		2.10	-	-	-	-	-	-	-	-	-

Note:

* Background Location

B Estimated Value

ND Not Detected

- Not-Analyzed

MDL Method Detection Limit

PRG Preliminary Remediation Goal (Lower of NC

Exceeds Highest PRG]

** USEPA Region 9 PRG tap water concentrati

**TABLE 6-4. SHALLOW AQUIFER GROUNDWATER - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	MDL	PRG	TEF	MW-12 2/15/01	MW-12-DUP 2/15/01	MW-12DIS 2/15/01	MW-14 2/15/01	*MW-17 2/14/01	*MW-17DIS 2/14/01	MW-34 2/15/01	MW-40 2/14/01
2378-TCDD	0.00237	0.00022	1	ND	ND	ND	ND	ND	ND	ND	ND
12378-PeCDD	0.00365	0.00044	0.5	ND	ND	ND	ND	ND	ND	ND	ND
123478-HxCDD	0.00690	0.0022	0.1	ND	0.0026	ND	ND	ND	ND	ND	ND
123678-HxCDD	0.00602	0.0022	0.1	0.0162	0.0236	ND	0.0057	ND	ND	ND	ND
123789-HxCDD	0.00340	0.0022	0.1	0.0026	0.0042	ND	0.0028	ND	ND	ND	ND
1234678-HpCDD	0.00465	0.022	0.01	0.921	1.48	0.0068	0.0383	0.0678	0.0056	0.0055	0.0221
OCDD	0.02406	0.22	0.001	9.88	16.0	0.0473	0.155	1.06	0.0329	0.0345	0.201
2378-TCDF	0.00178	0.0022	0.1	ND	ND	ND	ND	ND	ND	ND	ND
12378-PeCDF	0.00225	0.0044	0.05	ND	0.0019	ND	0.0015	ND	ND	ND	ND
23478-PeCDF	0.00128	0.00044	0.5	0.0013	0.0021	ND	0.0022	ND	ND	ND	ND
123478-HxCDF	0.00475	0.0022	0.1	0.0036	0.0058	ND	0.0107	ND	ND	0.0015	ND
123678-HxCDF	0.00365	0.0022	0.1	ND	0.0023	ND	0.0041	ND	ND	0.0013	ND
234678-HxCDF	0.00492	0.0022	0.1	0.0025	0.0040	ND	0.0043	ND	ND	0.0014	ND
123789-HxCDF	0.00245	0.0022	0.1	ND	0.0028	ND	0.004	ND	ND	ND	ND
1234678-HpCDF	0.00290	0.022	0.01	0.0903	0.148	0.0011	1.12	0.0309	0.0018	0.0188	0.0189
1234789-HpCDF	0.00394	0.022	0.01	0.0086	0.0149	ND	0.0099	ND	ND	ND	ND
OCDF	0.00609	0.22	0.001	0.674	1.07	ND	0.762	0.0513	ND	0.0110	0.0167
Total TCDDs	0.00237			ND	ND	ND	ND	ND	ND	ND	ND
Total PeCDDs	0.00365			ND	ND	ND	ND	ND	ND	ND	ND
Total HxCDDs	0.00690			0.141	0.226	ND	0.0467	0.0130	ND	ND	0.0061
Total HpCDDs	0.00465			3.44	5.46	0.0172	0.0878	0.226	0.0118	0.0120	0.105
Total TCDFs	0.00178			ND	ND	ND	ND	ND	ND	ND	ND
Total PeCDFs	0.00225			0.0013	0.0040	ND	0.0037	ND	ND	ND	ND
Total HxCDFs	0.00492			0.0735	0.118	ND	0.376	0.0160	ND	0.0103	0.0113
Total HpCDFs	0.00394			0.46	0.738	0.0030	2.00	0.0701	0.0018	0.0347	0.0422
Dilution Factor				1	1	1	1	1	1	1	1
2378-TCDD TEQ		0.00022		0.02389	0.03917	0.00013	0.01693	0.00210	0.00011	0.00071	0.00063

NOTES:

All results are in parts per trillion (ppt) by U.S. EPA Method 1613.

Preliminary Remediation Goal (PRG).

PRG is lower of NCAC 2L, MCL or MCLG.

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

TEQ calculated using zero for not-detected (ND).

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concentration.

Interferences may mask the result or constituent may or may not be present.

Exceeds Highest PRG.

MDL = Method Detection Limit

*Background sample

ND = Not Detected

**TABLE 6-5. PRELIMINARY REMEDIATION GOALS FOR DETECTED INTERMEDIATE GROUNDWATER CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L) Extractable Organics	MDL	PRG	MW-8A 11/14/98	MW-8A 2/13/01	MW-11A 2/15/01	MW-14A 2/15/01	MW-19A 2/15/01	MW-20A 2/13/01	MW-22A 2/14/01	MW-24A 2/15/01	MW-28A 2/14/01	MW-29A 2/15/01	MW-32 11/14/98	MW-32 2/13/01	MW-35 11/14/98	MW-35 2/15/01	MW-38* 11/14/98	MW-38* 2/14/01	MW-41 11/14/98	MW-41 2/14/01
2-Methylnaphthalene	0.00033	0.028	ND	ND	0.040	0.024	ND	ND	ND	0.00047J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	0.00025	0.080	ND	ND	0.039	0.027	0.0013J	ND	0.0012J	0.00074J	0.017	0.12	ND	ND	0.11	0.050	ND	ND	ND	ND
Anthracene	0.00033	2.10	ND	ND	0.0022J	0.0012J	ND	ND	ND	ND	ND	0.0020J	ND	ND	0.007J	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.00030	0.00005	ND	ND	0.00083J	ND	ND	ND	0.0020J	ND	0.0032J	0.00083J	ND	ND	ND	0.00090J	ND	0.0023J	ND	0.0021J
Benzo(a)Pyrene	0.00041	0.0000047	-	ND	ND	ND	ND	ND	ND	ND	0.0014J	ND	-	ND	-	ND	-	0.00072J	-	0.00050J
Benzo(b)Fluoranthene	0.00028	0.000047	-	ND	ND	ND	ND	ND	ND	ND	0.0013J	ND	-	ND	-	ND	-	ND	-	ND
Benzo(g,h,i)Perylene	0.00068	0.210	-	ND	ND	ND	ND	ND	ND	ND	0.0094J	0.0014J	-	ND	-	ND	-	ND	-	0.0074J
Benzo(k)Fluoranthene	0.00072	0.00047	-	ND	ND	ND	ND	ND	ND	ND	0.0012J	ND	-	ND	-	ND	-	ND	-	ND
Bis(2-Ethylhexyl)Phthalate	0.00048	0.003	-	ND	ND	ND	ND	ND	ND	ND	ND	0.00064J	-	ND	-	ND	-	ND	-	ND
Carbazole	0.00054	0.0034**	ND	ND	0.00095J	0.012	ND	ND	ND	ND	0.00075J	0.0072J	ND	ND	0.11	ND	ND	ND	ND	ND
Chrysene	0.00044	0.005	-	ND	0.00097J	ND	ND	ND	0.0047J	ND	0.0061J	0.00094J	-	ND	-	0.00087J	-	0.0050J	-	0.0048J
Dibenzo(a,h)Anthracene	0.00080	0.0000047	-	ND	ND	ND	ND	ND	ND	ND	0.011	0.0012J	-	ND	-	ND	-	ND	-	0.0098J
Dibenzofuran	0.00029	0.028	ND	ND	0.020	0.017	ND	ND	ND	0.00073J	ND	0.048	ND	ND	0.04	0.0029J	ND	ND	ND	ND
Di-n-Butyl-Phthalate	0.00026	0.70	-	ND	ND	ND	ND	ND	0.00080J	ND	ND	ND	-	ND	-	ND	-	ND	-	0.00029J
Fluoranthene	0.00033	0.280	ND	ND	0.0021J	0.0014J	ND	ND	ND	0.00050J	ND	0.0016J	ND	ND	0.007J	0.0046J	ND	ND	ND	ND
Fluorene	0.00038	0.280	ND	ND	0.020	0.015	ND	ND	ND	ND	ND	0.056	ND	ND	0.096	0.0025J	ND	ND	ND	ND
Indeno(1,2,3-Cd)Pyrene	0.00056	0.000047	-	ND	ND	ND	ND	ND	ND	ND	ND	0.0010J	-	ND	-	ND	-	ND	-	ND
Naphthalene	0.00036	0.021	ND	ND	0.036	0.057	ND	ND	0.00084J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.00033	0.210	ND	ND	0.014	0.014	0.00080J	ND	ND	0.0024J	ND	0.0015J	ND	ND	ND	0.00097J	ND	ND	ND	ND
Pyrene	0.00053	0.210	ND	ND	0.0010J	0.00076J	ND	ND	ND	ND	ND	0.00087J	ND	ND	0.003J	0.0027J	ND	ND	ND	ND

Note:
 * Background Location
 J Estimated Value
 N Presumptive Evidence for Presence of Material.
 ND Not Detected
 MDL Method Detection Limit
 PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
 ** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.
 Must calculate Interim 2L Standards for Carbazole and 2-Methylphenol (o-Cresol).
 Exceeds Highest PRG

**TABLE 6-6. PRELIMINARY REMEDIATION GOALS FOR DETECTED INTERMEDIATE GROUNDWATER CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L) Purgeable Organics	MDL	PRG	MW-8A 11/14/96	MW-8A 2/13/01	MW-11A 2/15/01	MW-14A 2/15/01	MW-19A 2/15/01	MW-20A 2/13/01	MW-22A 2/14/01	MW-24A 2/15/01	MW-28A 2/14/01
1,1,1-Trichloroethane		0.2	ND	-	-	-	-	-	-	-	-
Acetone	0.0099	0.70	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	0.00027	0.001	ND	ND	ND	ND	0.00040J	ND	ND	ND	ND
Chloroform (Trichloromethane)		0.00019	ND	-	-	-	-	-	-	-	-
Dichlorobromomethane		0.0006	ND	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	0.00031	0.005	-	ND	ND	ND	ND	0.00049J	ND	ND	ND
Ethyl Benzene	0.00083	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes		0.530	ND	-	-	-	-	-	-	-	-

Parameters (mg/L) Purgeable Organics	MDL	PRG	MW-29A 2/15/01	MW-32 2/13/01	MW-35 11/14/96	MW-35 2/15/01	MW-38* 11/14/96	MW-38* 2/14/01	MW-41 11/14/96	MW-41 2/14/01
1,1,1-Trichloroethane		0.2	-	-	-	-	0.001J	-	ND	-
Acetone	0.0099	0.70	ND	ND	-	ND	-	0.011J	-	0.011J
Benzene	0.00027	0.001	ND	ND	0.004J	0.00038J	ND	ND	ND	ND
Chloroform (Trichloromethane)		0.00019	-	-	0.016	-	ND	-	ND	-
Dichlorobromomethane		0.0006	-	-	0.002J	-	ND	-	ND	-
Dichloromethane (Methylene Chloride)	0.00031	0.005	ND	0.00055J	-	ND	-	ND	-	ND
Ethyl Benzene	0.00083	0.029	ND	ND	0.026	0.0036J	ND	ND	-	ND
Total Xylenes		0.530	-	-	0.032	-	ND	-	ND	-

Note:

- * Background Location
- J Estimated Value
- N Presumptive Evidence for Presence of Material.
- ND Not Detected
- MDL Method Detection Limit
- PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
- Exceeds Highest PRG

**TABLE 6-7. PRELIMINARY REMEDIATION GOALS FOR DETECTED INTERMEDIATE GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L)	BKGD	MDL	PRG	MW-8A 11/14/96	MW-8A 2/13/01	MW-11A 11/14/96	MW-11A 2/15/01	MW-11B 11/14/96	MW-14A 2/15/01	MW-19A 2/15/01	MW-20A 11/14/96	MW-20A 2/13/01	MW-22A 11/14/96	MW-22A 2/14/01	MW-24A 11/14/96	MW-24A 2/15/01
Inorganics																
Aluminum	0.160		3.6**	ND	-	ND	-	ND	-	-	ND	-	0.094	-	0.081	-
Arsenic (Total)	ND	0.0032	0.050	ND	ND	ND	0.0036B	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic (Dissolved)	-	0.0032	0.050	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	ND		0.005	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND	-
Calcium	47			48	-	3.8	-	52	-	-	43	-	12	-	17	-
Chromium (Total)	0.0039B	0.0017	0.050	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0026B	ND	ND
Chromium (Dissolved)	-	0.0017	0.050	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Total)	ND	0.00090	1.0	ND	ND	ND	0.0030B	ND	0.0025B	0.0017B	ND	0.0094B	ND	0.0023B	ND	0.0019B
Copper (Dissolved)	-	0.00090	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	2.6		1.1**	3.6	-	1.9	-	0.220	-	-	2.2	-	3.6	-	5.0	-
Lead (Total)	ND		0.015	0.012	-	ND	-	ND	-	-	ND	-	ND	-	ND	-
Lead (Dissolved)	-		0.015	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	3.9			3.2	-	2.7	-	1.7	-	-	4.1	-	4.2	-	4.1	-
Manganese	0.24		0.088**	0.078	-	0.062	-	ND	-	-	0.330	-	0.073	-	0.160	-
Nickel	0.020J		0.10	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND	-
Potassium	2.9			3.8	-	0.690	-	0.990J	-	-	3.5	-	2.0	-	1.4	-
Sodium	19			26	-	5.9	-	7.2	-	-	10	-	30	-	29	-
Vanadium	0.002J		0.026**	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND	-
Zinc	0.024		2.1	0.027	-	0.021	-	ND	-	-	ND	-	ND	-	ND	-

Note:
 * Background Location
 J Estimated Value
 N Presumptive Evidence for Presence of Material.
 ND Not Detected
 MDL Method Detection Limit
 PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
 Exceeds Highest PRG
 ** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.

TABLE 6-7. PRELIMINARY REMEDIATION GOALS FOR DETECTED INTERMEDIATE GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/L)	BKGD	MDL	PRG	MW-28A 11/14/96	MW-28A 2/14/01	MW-29A 11/14/96	MW-29A 2/15/01	MW-32 11/14/96	MW-32 2/13/01	MW-35 11/14/96	MW-35 2/15/01	MW-38* 11/14/96	MW-38* 2/14/01	MW-41 11/14/96	MW-41 2/14/01
Inorganics															
Aluminum	0.160		3.6**	ND	-	ND	-	0.220	-	0.350	-	0.160	-	0.380	-
Arsenic (Total)	ND	0.0032	0.050	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic (Dissolved)	-	0.0032	0.050	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	ND		0.005	ND	-	ND	-	ND	-	ND	-	ND	-	0.001J	-
Calcium	47			23	-	52	-	29	-	41	-	47	-	28	-
Chromium (Total)	0.0039B	0.0017	0.050	ND	ND	ND	ND	0.006J	ND	0.004J	0.0029B	0.002J	0.0039B	0.003J	0.0055B
Chromium (Dissolved)	-	0.0017	0.050	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Total)	ND	0.00090	1.0	ND	ND	ND	0.0035B	0.004J	0.0020B	0.017J	0.0051B	ND	ND	0.006J	0.0035B
Copper (Dissolved)	-	0.00090	1.0	-	-	-	-	-	-	-	-	-	-	-	-
Iron	2.6		1.1**	1.6	-	ND	-	0.380	-	0.390	-	2.6	-	1.2	-
Lead (Total)	ND		0.015	ND	-	ND	-	0.022	-	0.010	-	ND	-	0.014	-
Lead (Dissolved)	-		0.015	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	3.9			2.1	-	5.4	-	2.6	-	4.4	-	3.9	-	3.8	-
Manganese	0.24		0.088**	0.041	-	0.037	-	0.037	-	0.041	-	0.240	-	0.310	-
Nickel	0.020J		0.10	ND	-	ND	-	0.004J	-	0.004J	-	0.020J	-	0.041	-
Potassium	2.9			2.1	-	2.1	-	5.6	-	2.9	-	2.9	-	3.1	-
Sodium	19			8.6	-	20	-	43	-	25	-	19	-	23	-
Vanadium	0.002J		0.026**	ND	-	ND	-	0.003J	-	0.003J	-	0.002J	-	ND	-
Zinc	0.024		2.1	ND	-	ND	-	0.010	-	0.009J	-	0.024	-	0.023	-

Note:

- * Background Location
- J Estimated Value
- N Presumptive Evidence for Presence of Material.
- ND Not Detected
- MDL Method Detection Limit
- PRG Preliminary Remediation Goal (Lower of NCAC 2L, A Exceeds Highest PRG)
- ** USEPA Region 9 PRG tap water concentration adjust

**TABLE 6-8. PRELIMINARY REMEDIATION GOALS FOR DETECTED DEEP GROUNDWATER CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L) Extractable Organics	MDL	PRG	MW-33 11/14/96	MW-33 2/13/01	MW-36 11/14/96	MW-36 2/15/01	MW-36-Dup 2/15/01	MW-39* 11/14/96	MW-39* 2/14/01	MW-42 11/14/96	MW-42 2/14/01
2 - Methylanthralene	0.00033	0.028	-	ND	-	0.77	0.97	-	ND	-	ND
Acenaphthene	0.00025	0.080	0.020	0.052	0.045	0.48	0.54	ND	ND	ND	ND
Anthracene	0.00033	2.10	-	ND	-	0.022J	ND	-	ND	-	ND
Benzo(a)anthracene	0.00030	0.00005	-	ND	-	0.0031J	ND	-	0.0021J	-	0.0021J
Benzo(a)Pyrene	0.00041	0.000047	-	ND	-	ND	ND	-	ND	-	0.00047J
Benzo(b)Fluoranthene	0.00028	0.000047	-	ND	-	ND	ND	-	0.00034J	-	ND
Carbazole	0.00054	0.0034**	0.003J	ND	0.003J	0.20	0.20J	ND	ND	ND	ND
Chrysene	0.00044	0.005	-	ND	-	ND	ND	-	0.0047J	-	0.0047J
Dibenzofuran	0.00029	0.028	-	ND	-	0.33	0.37	-	ND	-	ND
Di-n-Butyl Phthalate	0.00026	0.70	-	ND	-	ND	ND	-	0.00035J	-	0.00030J
Fluoranthene	0.00033	0.280	ND	ND	0.003J	0.023J	0.019J	ND	ND	ND	ND
Fluorene	0.00038	0.280	0.002J	ND	0.015	0.29	0.30	ND	ND	ND	ND
Naphthalene	0.00036	0.021	-	ND	-	2.6	4.4	-	ND	-	ND
Phenanthrene	0.00033	0.210	-	ND	-	0.25	0.28	-	ND	-	ND
Pyrene	0.00053	0.210	ND	ND	0.002J	0.011J	ND	ND	ND	ND	ND

Notes:

- * Background Location
 - J Estimated Value
 - N Presumptive Evidence for Presence of Material.
 - ND Not Detected
 - MDL Method Detection Limit
 - PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
 - ** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.
Must calculate Interim 2L Standards for Carbazole and 2-Methylphenol (o-Cresol).
- Exceeds Highest PRG

**TABLE 6-9. PRELIMINARY REMEDIATION GOALS FOR DETECTED DEEP GROUNDWATER CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L) Purgeable Organics	MDL	PRG	MW-33 11/14/96	MW-33 2/13/01	MW-36 11/14/96	MW-36 2/15/01	MW-36-Dup 2/15/01	MW-39* 11/14/96	MW-39* 2/14/01	MW-42 11/14/96	MW-42 2/14/01
Acetone	0.0099	0.070	-	ND	-	ND	ND	-	0.011J	-	0.010J
Bromodichloromethane		0.0006	ND	-	0.005J	-	-	ND	-	ND	-
Chloroform		0.00019	ND	-	0.028	-	-	ND	-	ND	-
Dichloromethane (Methylene Chloride)	0.00031	0.005	-	0.00052J	-	ND	ND	-	ND	-	ND
Ethyl Benzene	0.00083	0.029	ND	-	0.003J	-	-	ND	-	ND	-
Total Xylenes	0.00019	0.530	ND	0.0027J	0.004J	ND	ND	ND	ND	ND	ND

* Background Location

J Estimated Value

N Presumptive Evidence for Presence of Material.

ND Not Detected

MDL Method Detection Limit

PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)

Exceeds Highest PRG

**TABLE 6-10. PRELIMINARY REMEDIATION GOALS FOR DETECTED DEEP GROUNDWATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L)	BKGD	MDL	PRG	MW-33 11/14/96	MW-33 2/13/01	MW-36 11/14/96	MW-36 2/15/01	MW-36-Dup 2/15/01	MW-39* 11/14/96	MW-39* 2/14/01	MW-42 11/14/96	MW-42 2/14/01
Inorganics												
Aluminum	0.095		3.6**	0.071	-	0.270	-	-	0.095	-	0.049	-
Arsenic (Total)	ND	0.0032	0.050	-	ND	-	ND	ND	-	ND	-	ND
Barium	0.012		2.0	0.043	-	0.088	-	-	0.012	-	0.200	-
Calcium	45			52	-	32	-	-	45	-	51	-
Chromium (Total)	0.0022B	0.0017	0.050	ND	ND	0.004J	0.0019B	ND	0.001J	0.0022B	ND	0.0022B
Copper (Total)	0.008J	0.00090	1.0	0.006J	ND	0.021J	0.0051B	0.0055B	0.008J	0.0071B	0.002J	0.0024B
Iron	0.14		1.1**	0.150	-	0.220	-	-	0.140	-	0.055	-
Lead	0.003J		0.015	0.012	-	0.022	-	-	0.003J	-	0.020	-
Magnesium	6.0			6.9	-	2.6	-	-	6.0	-	4.6	-
Manganese	0.021		0.088**	0.034	-	0.016	-	-	0.021	-	0.006J	-
Nickel	ND		0.10	0.003J	-	ND	-	-	ND	-	ND	-
Potassium	2.8			6.2	-	9.0	-	-	2.8	-	19	-
Sodium	11			52	-	54	-	-	11	-	46	-
Vanadium	ND		0.026**	ND	-	0.006J	-	-	ND	-	0.002J	-
Zinc	0.003J		2.1	0.013J	-	0.022	-	-	0.003J	-	0.004J	-

Notes:

- * Background Location
- B Estimated Value
- N Presumptive Evidence for Presence of Material.
- ND Not Detected
- MDL Method Detection Limit
- PRG Preliminary Remediation Goal (Lower of NCAC 2L, MCL or MCLG)
- Exceeds Highest PRG
- ** USEPA Region 9 PRG tap water concentration adjusted for non-carcinogenicity.

**TABLE 7. SEDIMENT SAMPLES - INDICATOR PARAMETERS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	BK-S1 10/24/00	SS-1 2/15/96	SS-1 1/23/01	SS-2 1/24/01	SS-3 1/24/01	SS-4 1/24/01	SS-5 1/24/01	SS-6 1/24/01	SS-7 2/15/96	SS-7 1/24/01	SS-7-Dup 1/24/01	SS-8 2/15/96	SS-9 2/15/96	SS-9 10/24/00	SS-10A 10/24/00
Laboratory															
Acid Volatile Sulfide	-	ND	-	-	-	-	-	-	ND	-	-	370	ND	-	-
Ammonia, Nitrogen	3.2	-	7.3	3.2	15.0	53.0	8.6	53.0	-	16.0	16.0	-	-	4.0	8.1
Total Organic Carbon	ND	99,000	64,000	29,000	15,000	69,000	6,000	75,000	25,000	23,000	19,000	41,000	3,000	5,200	25,000
Classification (Soil)		-	SM	SM	SP/SM	PT	SP/SM	SM	-	SM	SM	-	-	SM	SM
Percent Organics	1	-	15	37	7	55	1	18	-	10	10	-	-	2	9
Salinity (parts per thousand)	0.1	-	0.1	1	0.1	2	1	0.01	-	2	2	-	-	11	3
Percent Solids	73	-	30	51	50	31	70	20	-	70	54	-	-	68	39
Field Measurements															
Depth	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch
Odor		-		Slight		Strong	Slight	Strong		Strong	Strong			Slight	Moderate
Staining		-		Yes		Yes	Little	Yes		Yes	Yes			Yes	Yes
pH	6.6	-	6.7	7	6.8	7	7.1	6.8	-	6.9	6.9	-	-	6.4	7
ORP	-16	-	135	-167	-55	-50	-134	-36	-	-108	-108	-	-	24	-45

Notes:

- * Background Location
- J Estimated Value
- N Presumptive Evidence of Presence of Material.
- ND Not Detected
- Not Analyzed
- F¹ Laboratory Flag

**TABLE 7. SEDIMENT SAMPLES - INDICATOR PARAMETERS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	SS-11 2/15/96	SS-11 1/10/01	SS-12 1/23/01	SS-13 1/23/01	SS-14 2/16/96	SS-15 1/11/01	SS-16 10/24/00	SS-17 1/11/01	SS-18 2/16/96	SS-18 1/11/01	SS-19 10/24/00	SS-20 2/16/96	SS-20 1/11/01	SS-21 10/24/01	SS-22 1/11/01	SS-23 2/16/96
Laboratory																
Acid Volatile Sulfide	ND	-	-	-	ND	-	-	-	53	-	-	ND	-	-	-	ND
Ammonia, Nitrogen	-	ND	15.0	6.0	-	2.8	3.0	ND	-	3.7	0.67	-	96.0	1.3	5.6	-
Total Organic Carbon	4,600	2,300	51,000	38,000	9,200	4,400	18,000	920	49,000	4,300	ND	73,000	41,000	1,900	4,200	27,000
Classification (Soil)	-	SP	ML	ML	-	SP/SM	SM	SP	-	SW	SP/SM	-	ML	SP/SM	SP	-
Percent Organics	-	1	10	10	-	1	4	0	-	1	1	-	11	1	2	-
Salinity (parts per thousand)	-	0.1	2	1	-	11	6	0.1	-	9	8	-	9	7	5	-
Percent Solids	-	80	37	41	-	71	66	87	-	70	83	-	34	77	67	-
Field Measurements																
Depth	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch						
Odor										Slight	Slight					
Staining										Sheen						
pH	-	6.8	6.2	6.1	-	7.4	6.2	7.6	-	7.3	6.8	-	7.3	6.7	7.3	-
ORP	-	332	109	120	-	159	47	128	-	17	93	-	-67	57	230	-

**TABLE 7. SEDIMENT SAMPLES - INDICATOR PARAMETERS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	SS-23	SS-24	SD-01	SD-03	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-11	SD-13	SD-14	SD-15	SD-16	SD-17	SD-18
Laboratory	10/24/01	1/11/01	11/10/96	1/24/01	1/25/01	10/24/00	10/24/00	1/23/01	1/10/01	1/11/01	1/11/01	1/25/01	1/25/01	1/25/01	1/25/01	1/25/01	1/25/01
Acid Volatile Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia, Nitrogen	4.2	ND	-	0.61	2.5	6.3	31.0	2.7	2.0	36.0	120	10.0	1.9	17.0	ND	ND	0.71
Total Organic Carbon	23,000	1,200	-	2,500	45,000	11,000	100,000	50,000	10,000	55,000	57,000	120,000	69,000	260,000	4,300	9,300	9,800
Classification (Soil)	ML	SP	-	SP	SM	SM	ML	ML	SP	ML	ML	SM	ML	SM	SP	SP	SP
Percent Organics	5	1	-	2	23	5	36	17	2	15	12	20	23	41	1	4	3
Salinity (parts per thousand)	7	9	-	0.1	0.1	4	2	1	0.1	10	7	1	2	0.1	0.1	0.1	2
Percent Solids	47	74	-	72	41	61	24	36	63	25	25	35	35	11	81	60	68
Field Measurements																	
Depth	0 to 3-inch																
Odor						Moderate	Moderate		Slight								
Staining						Yes	Yes		Sheen	Sheen							
pH	7	7	-	7.3	7.1	7	6.7	6.1	6.4	6.8	7.3	5.2	5.8	5.8	5.1	5.1	5.6
ORP	7	300	-	15	-165	-20	-197	66	258	243	-51	287	145	175	420	340	285

**TABLE 7. SEDIMENT SAMPLES - INDICATOR PARAMETERS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	SD-18-Dup 1/25/01	SD-19 1/25/01	SD-20 1/23/01	SD-21 1/24/01 [F]	SD-22 1/24/01 [F]	SD-23 1/25/01 [F]	SD-24 1/25/01 [F]	SD-25 1/24/01 [F]	SD-26 1/23/01 [F]	SD-27 1/23/01 [F]	SD-28 1/23/01 [F]	SD-29 1/23/01 [F]	SD-30 1/10/01 [F]	SD-30-Dup 1/23/01 [F]
Acid Volatile Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia, Nitrogen	ND	1.9	8.1	ND	0.78	2.5	17.0	1.3	32.0	13.0	7.0	1.9	9.5	3.0
Total Organic Carbon	8600	21000	110000	2400	2500	43000	180000	16000	150000	48000	87000	4800	21000	36000
Classification (Soil)	SP	SP	ML	SP	SP	SM	PT	SW	ML	SM	ML	SP	SM	SM
Percent Organics	3	3	23	1	1	13	52	2	23	11	20	2	5	5
Salinity (parts per thousand)	2	1	1	0.1	0.1	0.1	1	0.1	3	3	2	1	1	1
Percent Solids	72	72	26	73	74	42	9	66	37	39	35	63	49	44
Field Measurements														
Depth	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch	0 to 3-inch
Odor								Slight	Strong	Strong	Strong			
Staining					Sheen		Little	Little	Yes	Yes	Yes			
pH	5.6	6.1	6.3	7.4	7.2	6.4	6.7	6.7	6.3	6.3	6.1	6.6	6.2	6.2
ORP	285	72	68	21	7	26	49	-60	60	35	33	157	177	177

**TABLE 7. SEDIMENT SAMPLES - INDICATOR PARAMETERS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	SD-31		SD-32		SD-33		SD-34		SD-35		SD-36		SD-37		SD-38		*SD-39		*SD-40		*SD-40-Dup		*SD-41		SD-42-Comp			
Laboratory	1/10/01	F ¹	1/25/01	F ¹	1/25/01	F ¹	1/25/01	F ¹	1/19/01	F ¹	3/22/01	F ¹	3/22/01	F ¹	3/22/01	F ¹	1/25/01	F ¹	1/18/01	F ¹								
Acid Volatile Sulfide	-		-		ND		-		-		-		-		-		-		-		-		-		-		ND	
Ammonia, Nitrogen	2.9		4.9		ND		19.0		6.4		12.0		1.5		0.55		2.4	B	0.73		ND		78		78		1.3	
Total Organic Carbon	2700		11000		1000		90000		16000		150000		58000		61000		390000		3300		2400		73000		73000		96000	
Classification (Soil)	SP		SP		SP		SM		SM		ML		ML		ML		PT		ML		ML		SM		SM		ML	
Percent Organics	1		1		2		7		5		38		14		15		70		14		14		14		14		31	
Salinity (parts per thousand)	2		0.1		0.1		4		3		2		1		1		0.1		5		5		5		1		3	
Percent Solids	81		54		80		23		71		22		38		41		-		82		80		80		42		-	
Field Measurements																												
Depth	0 to 3-inch																											
Odor																												Strong
Staining			Sheen																									Yes
pH	6.9		6.3		6.6		6.1		6.8		5.7		5.7		5.8		4		7.2		7.2		7.2		6.9		6.5	
ORP	313		277		258		213		346		102		214		235		308		-69		-69		-69		-54		-71	

**TABLE 7. SEDIMENT SAMPLES - INDICATOR PARAMETERS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	SD-43-Comp		SD-44-Comp		SD-45-Comp		SD-45-COMP-Dup		SD-46-Comp		SD-47-Comp		SD-48	
	1/18/01	F ¹	1/18/01	F ¹	1/18/01	F ¹	1/18/01	F ¹	1/18/01	F ¹	1/18/01	F ¹	1/25/01	F ¹
Laboratory														
Acid Volatile Sulfide	ND		ND		ND		ND		ND		ND		-	
Ammonia, Nitrogen	0.66		13		1.3		0.71		4.6		0.72		-	
Total Organic Carbon	56000		100000		880		880		2400		8400		-	
Classification (Soil)	ML		SM		SP		SP		SM		SP		SP	
Percent Organics	15		24		1		1		3		4		3	
Salinity (parts per thousand)	2		1		0.1		0.1		5		0.1		0.1	
Percent Solids	-		-		-		-		-		-		68	
Field Measurements														
Depth	0 to 3-inch		0 to 3-inch		0 to 3-inch		0 to 3-inch		0 to 3-inch		0 to 3-inch		0 to 3-inch	
Odor	Strong		Slight		Slight		Slight		Slight					
Staining	Yes		Sheen		Sheen		Sheen		Sheen		Sheen		Sheen	
pH	6.4		6.7		6.7		6.7		6.8		7.6		6.5	
ORP	102		-74		-17		-17		252		103		74	

TABLE 8-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameter (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	RB-5	BK-S1	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-10A	SS-11	
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	In SW	1/7/85	1/7/85	12/9/92	12/9/92	12/9/92	12/9/92	12/9/92	12/9/92	12/9/92	12/14/92	12/14/92	12/14/92	1/19/93	12/14/92	
1-Methylnaphthalene	?																				
2-Chloronaphthalene	N	0.024	460	10,800		NO	0.019	0.024	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N		11.2	38		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-Methylphenol	?					NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	N		740	7,600		NO	ND	ND	0.51	ND	ND	0.59	4.4	2.9	44	1.0	32	ND	3.3	ND	
Acenaphthylene	?					NO	0.030J	ND	-	-	-	-	-	-	-	-	-	-	-	-	
Aminofluorenone	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N		4,400	20,000		-	0.070J	ND	ND	ND	ND	ND	45	36	10	ND	49	ND	ND	ND	
Anthracenecarbonitrile	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	C	0.088J	0.62	2.9	738	NO	0.078	ND	1.1	0.54	ND	1.1	5.8	7.4	3.2	ND	26	730	7.3	ND	
Benzo(a)Pyrene	C	0.052J	0.062	0.29	74	NO	0.090J	ND	0.42	ND	ND	2.0	3.1	1.9	0.64	ND	9.0	680	2.6	ND	
Benzo(b)Fluoranthene	C	0.053J	0.62	2.9	738	NO	-	-	ND	0.75	ND	ND	ND	ND	ND	ND	15	1800	6.0	ND	
Benzo(b,k)Fluoranthene	?					NO	0.11	ND	-	-	-	-	-	-	-	-	-	-	-	-	
Benzo(g,h,i)Perylene	N	0.046J		10,800		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)Fluoranthene	C	0.064J	6.2	29	7,394	NO	-	-	1.5	ND	ND	4.9	3.8	3.6	1.2	ND	ND	ND	2.1	ND	
Benzoanthracene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluoranthene (not b or k)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene (not b or k)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluorene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluorene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(c)fluorene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(e)fluorene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)anthracene (not a)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl)Phthalate	C		35	180		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C		24	120		NO	-	-	ND	ND	ND	ND	18	4.4	17	ND	ND	ND	ND	ND	ND
Chrysene	C	0.096J	62	290	73,944	NO	0.18	ND	1.1	0.53	ND	1.6	4.5	5.5	1.9	ND	22	920	9.0	ND	
Cyclopentaphenanthrene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclopentapyrene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)Anthracene	C		0.062	0.29	74	NO	ND	ND	ND	ND	ND	3.7	ND	ND	ND	ND	0.94	ND	ND	ND	ND
Dibenzofuran	N		58	1020		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzothiophene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butylphthalate	N	0.058J	1,220	17,600		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	N	0.3J	460	6,000		NO	0.35	0.300J	3.8	0.87	ND	1.8	38	52	26	ND	130	1,300	15	ND	
Fluorene	N		520	6,600		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobiphenyl	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexahydrodihydroxytrimethyl	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	C		0.62	29	738	NO	ND	ND	ND	ND	ND	2.0	0.67	0.72	ND	ND	3.4	680	ND	ND	ND
Methylantracene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylantracene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylchrysene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylpyrene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	N		11.2	38	137,666	NO	ND	ND	ND	ND	ND	ND	1.8	ND	44	ND	ND	ND	ND	ND	ND
Octahydrodimethyl (Methyletheryl)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorobiphenyl (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	C		3	11		NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	?					NO	0.07	ND	1.5	0.56	ND	ND	42	36	55	ND	70.0	ND	ND	ND	ND
Phenylnaphthalene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N		460	10,800		NO	0.300J	0.500J	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetramethylphenanthrene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs). C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 * Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected

**TABLE 8-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	SS-12	SS-12 DUP	SS-13	**SS14	SS15	SS16	SS16-DUP	SS17	SS18	SS19	SS20	SS21	SS22	SS23	SS24	
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	In SW	2/15/96	2/15/96	2/15/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	
1-Methylnaphthalene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	N	0.024	460	10,800			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N		11.2	38			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-Methylphenol	?						NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	N		740	7,600			NO	1.8	1.9	ND	24	ND	ND	ND	1.1	ND	ND	11	ND	ND	ND	ND
Acenaphthylene	?						NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aminofluorenone	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N		4,400	20,000			-	1.1	ND	ND	13	ND	ND	ND	2.2	20	ND	40	1.8	17	ND	ND
Anthracenecarbonitrile	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	C	0.088J	0.62	2.9	738	NO	1.9	1.4	2.3	6.4	1.4	ND	ND	1.3	1.7	12	ND	13	ND	ND	ND	ND
Benzo(a)Pyrene	C	0.052J	0.062	0.29	74	NO	0.99	0.73	ND	6.3	1.3	ND	ND	ND	ND	5.9	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	C	0.053J	0.62	2.9	738	NO	2.0	1.5	2.2	6.6	1.8	ND	1.4	1.6	ND	11	ND	11	ND	ND	ND	ND
Benzo(b,k)Fluoranthene	?						NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	N	0.046J		10,800			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)Fluoranthene	C	0.064J	6.2	29	7,394	NO	ND	ND	ND	ND	ND	1.6	ND	ND	ND	5.5	ND	ND	ND	ND	ND	ND
Benzoanthracene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoofluoranthene (not b or k)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoofluoranthene (not b or k)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluorene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluorene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzofluorene (3 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzonaphthothiophene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzonaphthothiophene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene (not a)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl)Phthalate	C		35	180			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	C		24	120			NO	ND	ND	ND	ND	ND	ND	ND	ND	4.7	ND	15	ND	ND	ND	ND
Chrysene	C	0.096J	62	290	73,944	NO	2.4	1.6	3.0	5.7	1.2	1.2	1.2	1.4	1.6	15	ND	18	ND	ND	ND	ND
Cyclopentaphenanthrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclopentapyrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)Anthracene	C		0.062	0.29	74	NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	N		58	1020			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzothiophene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (3 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butylphthalate	N	0.058J	1,220	17,600			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	N	0.3J	460	6,000			NO	6.8	6.0	10	22	1.1	3.0	3.2	4.7	7.5	60	2.6	54	2.9	55	ND
Fluorene	N		520	6,600			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobiphenyl	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexahydrodihydroxytrimethyl	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	C		0.62	29	738	NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylantracene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylantracene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylchrysene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylidibenzofuran	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (3 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylpyrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	N		11.2	38	137,666	NO	ND	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Octahydrodimethyl (Methylethyl)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorobiphenyl (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	C		3	11			NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perylene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	?						NO	ND	ND	ND	40	ND	ND	ND	ND	19	ND	31	ND	ND	ND	ND
Phenylnaphthalene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N		460	10,800			NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetramethylphenanthrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
 ** Impacted Background Location
 J = Estimated Value
 N = Presumptive Evidence of Presence of Material.
 C = Carcinogen
 N = Non-carcinogen
 Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific
 SW = Surface Water
 - = Not Analyzed
 ND = Not Detected

TABLE 8-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameter (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	SD-01	SD-03	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-11	SD-12	SD-13	SD-14	SD-15	SD-16	SD-17	SD-18	SD-19	SD-20
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	In SW	11/10/96	11/10/96	11/8/96	11/9/96	11/9/96	11/9/96	11/9/96	11/10/96	11/10/96	11/10/96	11/8/96	11/8/96	11/8/96	11/8/96	11/8/96	11/8/96	11/8/96	11/8/96
1-Methylnaphthalene	?					NO	-	-	-	20JN	20JN	-	2JN	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	N	0.024	460	10,800		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	N		11.2	38		NO	ND	ND	ND	38	21J	0.340J	4.0J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-Methylphenol	?					NO	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.260J	ND	ND	ND	ND
Acenaphthene	N		740	7,600		NO	0.130J	0.140J	ND	31	63	0.590J	6.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	?					NO	ND	0.070J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.210J	ND	ND	ND	ND	ND	ND
Aminofluorenone	?					-	-	-	-	5JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N		4,400	20,000		-	0.170J	0.340J	0.140J	61	88	7.8	33	0.110J	0.740J	ND	ND	0.780	ND	ND	ND	ND	0.240J	ND
Anthracenecarbonitrile	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.200JN	-
Benz(a)anthracene	C	0.088J	0.62	2.9	738	NO	0.860	ND	0.260J	33	38	ND	ND	ND	ND	ND	0.170J	0.970	ND	ND	ND	ND	0.550	ND
Benzo(a)Pyrene	C	0.052J	0.062	0.29	74	NO	0.780	0.440J	0.250J	10J	11J	0.630J	0.750J	0.180J	0.280J	ND	0.150J	1.4	ND	ND	ND	0.140J	0.880J	0.094J
Benzo(b)Fluoranthene	C	0.053J	0.62	2.9	738	NO	1.4J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,k)Fluoranthene	?					NO	1.4J	0.920J	0.350J	27J	26J	2.2J	1.1J	0.380J	0.690J	ND	0.540J	3.8J	ND	ND	0.051J	0.200J	3.8J	0.130J
Benzo(g,h,i) Perylene	N	0.046J		10,800		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)Fluoranthene	C	0.064J	6.2	29	7,394	NO	1.4J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoanthracenone	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.100JN	-
Benzo(a)fluoranthene (not b or k)	?					-	-	-	-	8JN	9JN	-	-	-	-	-	-	0.700JN	-	-	-	-	-	-
Benzo(b)fluoranthene (not b or k)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1JN
(2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluorene	?					-	-	-	-	-	-	0.800JN	-	0.090JN	-	-	-	0.200JN	-	-	-	-	-	0.200JN
Benzo(b)fluorene (2 isomers)	?					-	-	-	-	-	-	-	3JN	-	-	-	-	-	-	-	-	-	-	-
Benzo(c)fluorene (3 isomers)	?					-	-	-	-	30JN	40JN	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	?					-	0.500JN	-	-	-	-	-	-	0.200JN	-	-	-	-	-	-	-	-	-	-
Benzo(b)anthracene (2 isomers)	?					-	-	-	-	10JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(e)anthracene (not a)	?					-	-	-	-	-	-	-	-	-	-	-	-	0.300JN	-	-	-	-	-	-
Bis(2-Ethylhexyl)Phthalate	C		35	180		NO	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	C		24	120		NO	0.200J	0.059J	0.640J	20	9.8J	1.4J	4.8	ND	0.170J	ND	ND	0.100J	ND	ND	ND	ND	ND	ND
Chrysene	C	0.096J	62	290	73,944	NO	1.2	0.520J	0.320J	42	46	2.2	3.1J	0.130J	0.450J	ND	0.330J	1.5	ND	ND	ND	0.160J	1.3	0.075J
Cyclopentaphenanthrene	?					-	-	-	-	-	-	-	-	-	-	-	-	0.200JN	-	-	-	-	-	-
Cyclohexapyrene	?					-	-	-	-	-	-	-	-	-	-	-	-	0.100JN	-	-	-	-	-	0.300JN
Dibenzo(a,h)Anthracene	C		0.062	0.29	74	NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.200J	ND
Dibenzofuran	N		58	1020		NO	0.082J	ND	ND	21	37	0.860J	6.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzothiophene	?					-	-	-	-	7JN	20JN	-	2JN	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (2 isomers)	?					-	-	-	-	-	20JN	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (3 isomers)	?					-	-	-	-	-	-	-	4JN	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butylphthalate	N	0.058J	1,220	17,600		NO	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	N	0.3J	460	6,000		NO	2.2	1.0	0.580	130	190	5.5	13	0.100J	1.2J	ND	0.240J	1.0	ND	ND	ND	0.170J	0.7	0.065J
Fluorene	N		520	6,600		NO	0.110J	ND	ND	41	89	2.2	9.6	ND	ND	ND	ND	0.069J	ND	ND	ND	ND	ND	ND
Hexachlorobiphenyl	?					-	-	-	-	-	-	-	-	-	-	-	0.100JN	-	-	-	-	-	-	-
Hexahydroxytrimethyl	?					-	-	-	-	-	-	4JN	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	C		0.62	29	738	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylantracene	?					-	-	-	-	10JN	40JN	1JN	-	-	-	-	-	-	-	-	-	-	-	-
Methylantracene (2 isomers)	?					-	-	-	-	-	-	-	4JN	-	-	-	-	-	-	-	-	-	-	-
Methylchrysene	?					-	1JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl dibenzofuran	?					-	-	-	-	10JN	-	1JN	-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene	?					-	-	-	-	-	-	1JN	-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene (2 isomers)	?					-	-	-	-	-	30JN	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (2 isomers)	?					-	-	-	-	-	30JN	-	4JN	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (3 isomers)	?					-	-	-	-	30JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylpyrene	?					-	-	-	-	-	6JN	-	-	-	-	-	-	0.100JN	-	-	-	-	-	-
Naphthalene	N		11.2	38	137,668	NO	ND	ND	ND	3.2J	13J	ND	3.6J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Octahydrodimethyl (Methyl)ethenyl	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.200JN	-	-	-	-
Pentachlorobiphenyl (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.400JN
Pentachlorophenol	C		3	11		NO	1.8J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.220J	ND	ND	ND	ND	ND	ND
Perylene	?					-	-	-	-	-	-	-	-	-	-	-	0.200JN	-	-	-	-	-	0.100JN	-
Phenanthrene	?					NO	1.2	0.200J	0.260J	94	230	7.0	22	ND	0.140J	ND	ND	0.130J	ND	ND	ND	ND	0.110J	ND
Phenylanthracene	?					-	-	-	-	10JN	20JN	-	1JN	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N		460	10,800		NO	1.7	0.750	0.630	91	140	ND	9.2	0.100J	0.810J	ND	0.350J	1.6	ND	ND	ND	0.190J	1.6	0.077J
Tetramethylphenanthrene	?					-	-	-	-	-	-	3JN	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).

Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG

* Background Location

** Impacted Background Location

J = Estimated Value

N = Presumptive Evidence of Presence of Material.

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

SW = Surface Water

- = Not Analyzed

ND = Not Detected

TABLE 8-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameter (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	SD-21	SD-22	SD-23	SD-24	SD-25	SD-26	SD-27	SD-28	SD-29	SD-30	SD-30-Dup
Extractable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	In SW	1/24/01	1/24/01	1/25/01	1/25/01	1/24/01	1/23/01	1/23/01	1/23/01	1/23/01	1/10/01	1/23/01
							F ¹										
1-Methylnaphthalene	?					-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	N	0.024	460	10,800		NO	ND										
2-Methylnaphthalene	N		11.2	38		NO	ND	0.21	J	ND							
4-Chloro-3-Methylphenol	?					NO	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	N		740	7,600		NO	ND	1.1	ND	ND	8.8	250	7.5	60	ND	ND	0.21
Acenaphthylene	?					NO	ND	0.34									
Aminofluorenone	?					-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	N		4,400	20,000		-	ND	1.8	ND	ND	2.9	J	420	13	200	0.79	0.91
Anthracenecarbonitrile	?					-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	C	0.088J	0.62	2.9	738	NO	0.050	J	6.7	1.5	0.70	J	6.2	100	9.8	64	1.8
Benzo(a)Pyrene	C	0.052J	0.062	0.29	74	NO	ND	5.5	0.95	ND	2.3	J	ND	4.2	ND	1.3	ND
Benzo(b)Fluoranthene	C	0.053J	0.62	2.9	738	NO	0.059	J	6.1	1.6	ND	3.4	J	ND	5.0	29	2.4
Benzo(b,k)Fluoranthene	?					NO	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	N	0.046J		10,800		NO	ND	3.4	ND	ND	1.0	J	ND	ND	ND	0.57	ND
Benzo(k)Fluoranthene	C	0.064J	6.2	29	7,394	NO	0.053	J	5.3	1.3	ND	3.0	J	ND	4.8	ND	1.6
Benzoanthracene	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluoranthene (not b or k)	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene (not b or k)	?					-	-	-	-	-	-	-	-	-	-	-	-
(2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluorene	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluorene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)fluorene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzonaphthothiophene	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)pyrene (not a)	?					-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl)Phthalate	C		35	180		NO	ND	0.32	J	ND							
Carbazole	C		24	120		NO	ND	1.7	ND	0.14							
Chrysene	C	0.096J	62	290	73,944	NO	0.062	J	7.5	1.9	1.1	J	7.4	110	11	78	2.9
Cyclopentaphenanthrene	?					-	-	-	-	-	-	-	-	-	-	-	-
Cyclopentapyrene	?					-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)Anthracene	C		0.062	0.29	74	NO	ND	1.8	ND	1.1							
Dibenzofuran	N		58	1020		NO	ND	0.57	ND	ND	2.8	J	200	4.3	45	ND	0.15
Dibenzothiophene	?					-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Dimethylnaphthalene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butylphthalate	N	0.058J	1,220	17,600		NO	ND	0.076	J	ND							
Fluoranthene	N	0.3J	460	6,000		NO	0.074	J	15	2.1	1.4	J	38	650	49	390	4.6
Fluorene	N		520	6,600		NO	ND	0.74	ND	ND	7.4	370	10	96	ND	ND	0.25
Hexachlorobiphenyl	?					-	-	-	-	-	-	-	-	-	-	-	-
Hexahydrohydroxytrimehyl	?					-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	C		0.62	29	738	NO	ND	4.0	ND	ND	1.3	J	ND	1.8	ND	0.72	ND
Methylanthracene	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylanthracene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylchrysene	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylidibenzofuran	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylfluorene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylphenanthrene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Methylpyrene	?					-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	N		11.2	38	137,666	NO	ND	0.30	J	ND							
Octahydrodimethyl (Methylethenyl)	?					-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorobiphenyl (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	C		3	11		NO	ND										
Perylene	?					-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	?					NO	ND	9.4	ND	ND	14	980	26	230	ND	ND	0.60
Phenylanthracene	?					-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	N		460	10,800		NO	ND	12	1.7	1.0	J	23	360	30	230	3.2	0.98
Tetramethylphenanthrene	?					-	-	-	-	-	-	-	-	-	-	-	-

Notes:
USEPA Region 9 Preliminary Remediation Goals (PRGs).
Cancer Risk = 1E-06 and Chronic HQ = 0.2
? No health data evaluation as to carcinogenicity.
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* Background Location
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TABLE 8-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameter (mg/kg)	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	SD-31		SD-32		SD-33		SD-34		SD-35		SD-36		SD-37		SD-38		*SD-39		*SD-40		*SD-40-Dup		*SD-41		*SD-48	
							1/10/01	F ¹	1/25/01	F ¹	1/25/01	F ¹	1/25/01	F ¹	1/19/01	F ¹	3/22/01	F ¹	3/22/01	F ¹	3/22/01	F ¹										
Extractable Organics																																
1-Methylnaphthalene	?																															
2-Chloronaphthalene	N	0.024	460	10,800			NO	ND	ND	ND	ND	ND	ND																			
2-Methylnaphthalene	N		11.2	38			NO	ND	ND	ND	ND	ND	ND																			
4-Chloro-3-Methylphenol	?						NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Acenaphthene	N		740	7,600			NO	ND	ND	ND	ND	ND	ND																			
Acenaphthylene	?						NO	ND	ND	ND	ND	ND	ND																			
Aminofluorenone	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Anthracene	N		4,400	20,000			-	ND	ND	ND	2.9	ND	ND	ND	ND	ND	ND															
Anthracenecarbonitrile	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benz(a)anthracene	C	0.088J	0.62	2.9	738	NO	ND	ND	0.65	ND	3.2	ND	ND	ND	0.088	J	0.048	J	0.048	J	ND	ND	ND									
Benzo(a)Pyrene	C	0.052J	0.062	0.29	74	NO	ND	ND	ND	ND	1.9	0.58	ND	ND	ND	1.5	J	ND	ND	ND	ND	1.5	J	ND	0.052	J	0.038	J	ND	ND	ND	
Benzo(b)Fluoranthene	C	0.053J	0.62	2.9	738	NO	ND	ND	ND	ND	3.0	1.5	ND	ND	ND	2.0	J	ND	ND	ND	ND	0.053	J	0.031	J	0.031	J	ND	ND	ND		
Benzo(b,k)Fluoranthene	?						NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(g,h,i)Perylene	N	0.046J		10,800			NO	ND	ND	ND	ND	0.61	ND	ND	0.046	J	ND	ND	ND	ND	ND	ND										
Benzo(k)Fluoranthene	C	0.064J	6.2	29	7,394	NO	ND	ND	ND	ND	2.3	1.3	ND	ND	ND	1.9	J	ND	ND	ND	ND	0.064	J	0.052	J	0.052	J	ND	ND	ND		
Benzoanthracenone	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(a)fluoranthene (not b or k)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(b)fluoranthene (not b or k)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
(2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(a)fluorene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(b)fluorene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(c)fluorene (3 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(a)phthothiophene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(b)phthothiophene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzo(p)pyrene (not a)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bis(2-Ethylhexyl)Phthalate	C		35	180			NO	ND	ND	ND	ND	ND	ND																			
Carbazole	C		24	120			NO	ND	ND	ND	ND	ND	ND																			
Chrysene	C	0.096J	62	290	73,944	NO	ND	ND	0.94	ND	4.6	0.80	ND	ND	ND	1.6	J	ND	ND	ND	ND	0.096	J	0.042	J	0.042	J	ND	ND	ND		
Cyclopentaphenanthrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cyclopentapyrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Dibenzo(a,h)Anthracene	C		0.062	0.29	74	NO	ND	ND	ND	ND	ND	ND	ND																			
Dibenzofuran	N		58	1020			NO	ND	ND	ND	ND	ND	ND																			
Dibenzothiophene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Dimethylnaphthalene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Dimethylnaphthalene (3 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Di-n-Butylphthalate	N	0.058J	1,220	17,600			NO	ND	ND	ND	0.058	J	ND	ND	ND	ND																
Fluoranthene	N	0.3J	460	6,000			NO	ND	1.4	ND	9.3	ND	ND	ND	ND	1.6	J	ND	ND	ND	ND	ND										
Fluorene	N		520	6,600			NO	ND	ND	ND	ND	ND																				
Hexachlorobiphenyl	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Hexahydrodihydroxytrimethyl	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Indeno(1,2,3-cd)Pyrene	C		0.62	29	738	NO	ND	ND	ND	ND	ND	0.61	ND	ND	ND	ND	ND	ND														
Methylanthracene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylanthracene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylchrysene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methyl dibenzofuran	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylfluorene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylfluorene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylphenanthrene (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylphenanthrene (3 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methylpyrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Naphthalene	N		11.2	38	137,666	NO	ND	ND	ND	ND	ND	ND																				
Octahydrodimethyl (Methylethenyl)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Pentachlorobiphenyl (2 isomers)	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Pentachlorophenol	C		3	11			NO	ND	ND	ND	ND	ND																				
Perylene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Phenanthrene	?						NO	ND	ND	ND	ND	ND																				
Phenylnaphthalene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Pyrene	N		460	10,800			NO	ND	1.0	ND	5.4	0.71	ND	ND	ND	1.2	J	ND	ND	ND	ND	ND										
Tetramethylphenanthrene	?						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 Cancer Risk = 1E-06 and Chronic HQ = 0.2
 ? No health data evaluation as to carcinogenicity.
 Exceeds Highest PRG.
 * Background Location
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TABLE 8-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	RB-5	BK-S1	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-10A	SS-11	
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	In SW	1/7/85	1/7/85	12/9/92	12/9/92	12/9/92	12/9/92	12/9/92	12/9/92	12/9/92	12/14/92	12/14/92	12/14/92	1/19/93	12/14/92	
1,2-Dichloropropane	C/N		0.35	0.77		NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	N	0.021J	320	1240		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Camphene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	C/N		8.9	21		NO	-	-	0.024	0.0064	0.015	0.017	0.012	0.014	0.059	0.007	0.020	0.008	-	0.0068	
Dihydromethylindene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	N		300	300		NO	ND	ND	ND	ND	ND	ND	ND	ND	0.15	ND	ND	ND	ND	ND	ND
Ethylidimethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylidimethylbenzene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylidimethylbenzene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indane	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M/P-Xylene	N		210	210		NO	-	-	0.0025	ND	ND	0.001	0.0011	0.0014	0.084	ND	0.0071	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	N	0.021J	1460	5600		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (3 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylindan	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O-Xylene	N		210	210		NO	-	-	0.0011	ND	ND	ND	ND	ND	0.069	ND	0.0075	ND	ND	ND	ND
Tetramethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	N		104	520		***YES	ND	ND	0.0024	ND	ND	ND	0.0013	0.0034	0.016	ND	ND	ND	ND	ND	ND
Total Xylenes	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

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TABLE 8-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	SS-12	SS-12 DUP	SS-13	SS14	SS15	SS16	SS16-DUP	SS17	SS18	SS19	SS20	SS21	SS22	SS23	SS24
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	In SW	2/15/96	2/15/96	2/15/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96	2/16/96
1,2-Dichloropropane	C/N		0.35	0.77		NO	ND	ND	ND	ND	0.065	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	N	0.021J	320	1240		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Camphene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	C/N		8.9	21		NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dihydromethylindene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	N		300	300		NO	ND	ND	ND	0.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylidimethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylidimethylbenzene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylidimethylbenzene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indane	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M/P-Xylene	N		210	210		NO	ND	ND	ND	0.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	N	0.021J	1460	5600		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (3 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylindan	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O-Xylene	N		210	210		NO	ND	ND	ND	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetramethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	N		104	520		***YES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

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***YES Toluene detected at 0.001 mg/l in Cape Fear River Upgradient of Site.

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**TABLE 8-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present in SW	SD-01 11/10/96	SD-03 11/10/96	SD-05 11/8/96	SD-06 11/9/96	SD-07 11/9/96	SD-08 11/9/96	SD-09 11/9/96	SD-10 11/10/96	SD-11 11/10/96	SD-12 11/10/96	SD-13 11/8/96	SD-14 11/8/96	SD-15 11/8/96	SD-16 11/8/96	SD-17 11/8/96	SD-18 11/8/96	SD-19 11/8/96	SD-20 11/8/96
Purgeable Organics																								
1,2-Dichloropropane	C/N		0.35	0.77		NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	N	0.021J	320	1240		NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Camphene	?					-	-	-	0.040JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	C/N		8.9	21		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dihydromethylindene	?					-	-	-	-	0.100JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	N		300	300		NO	0.003J	ND	ND	0.064	0.020J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylmethylbenzene	?					-	-	-	-	0.060JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene (2 isomers)	?					-	-	-	-	-	-	0.010JN	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene (3 isomers)	?					-	-	-	0.200JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene	?					-	-	-	-	-	0.070JN	-	-	-	-	-	-	-	-	-	-	-	-	-
Indane	?					-	-	-	2JN	0.900JN	-	0.050JN	-	-	-	-	-	-	-	-	-	-	-	-
Indene	?					-	-	-	0.030JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M/P-Xylene	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	N	0.021J	1460	5600		NO	ND	ND	ND	0.100	0.320	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylbenzofuran (2 isomers)	?					NO	-	-	-	-	0.400JN	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (3 isomers)	?					NO	-	-	-	0.900JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylindan	?					NO	-	-	-	0.400JN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O-Xylene	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetramethylbenzene	?					NO	-	-	-	-	-	0.008JN	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	N		104	520		***YES	0.160	ND	ND	0.020J	ND	ND	ND	ND	ND	0.002J	ND	ND	ND	ND	0.002J	ND	ND	ND
Total Xylenes	N		210	210		NO	ND	ND	ND	0.094	0.037J	ND	0.002J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trimethylbenzene	?					NO	-	-	-	-	-	-	0.010JN	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene (2 isomers)	?					NO	-	-	-	0.400JN	0.200JN	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
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SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	SD-21	SD-22	SD-23	SD-24	SD-25	SD-26	SD-27	SD-28	SD-29	SD-30	SD-30-Dup	SD-31	SD-32	
							1/24/01 F ¹	1/24/01 F ¹	1/25/01 F ¹	1/25/01 F ¹	1/24/01 F ¹	1/23/01 F ¹	1/10/01 F ¹	1/23/01 F ¹	1/10/01 F ¹	1/10/01 F ¹				
Purgeable Organics																				
1,2-Dichloropropane	C/N		0.35	0.77		NO	ND													
Acetone	N	0.021J	320	1240		NO	ND	ND	ND	ND	ND	0.14 J	0.048 J	0.064 J	0.15	0.14	0.075 J	ND	ND	ND
Camphene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	C/N		8.9	21		NO	ND													
Dihydromethylindene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	N		300	300		NO	ND													
Ethylmethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indane	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indene	?					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M/P-Xylene	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	N	0.021J	1460	5600		NO	ND	ND	ND	ND	ND	0.050 J	ND	0.029 J	0.013 J	ND	0.011 J	ND	ND	ND
Methylbenzofuran (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (3 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylindan	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O-Xylene	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetramethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	N		104	520		***YES	ND													
Total Xylenes	N		210	210		NO	ND	ND	ND	ND	ND	0.011 J	ND							
Trimethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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ND = Not Detected

**TABLE 8-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health	Health	S-Spec.	Present	SD-33	SD-34	SD-35	SD-36	SD-37	SD-38	*SD-39	*SD-40	*SD-40-Dup	*SD-41	SD-48
Purgeable Organics	N	PRG	Res. PRG	Ind. PRG	Ind. PRG	in SW	1/10/01 [F]	1/10/01 [F]	1/10/01 [F]	1/25/01 [F]	1/25/01 [F]	1/25/01 [F]	1/19/01 [F]	3/22/01 [F]	3/22/01 [F]	1/25/01 [F]	1/25/01 [F]
1,2-Dichloropropane	C/N		0.35	0.77		NO	ND										
Acetone	N	0.021J	320	1240		NO	ND	0.50	0.11	ND	ND	ND	ND	0.019 J	0.021 J	ND	ND
Camphene	?					-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	C/N		8.9	21		NO	ND	ND	ND	0.0094 J	ND	ND	ND	ND	ND	0.011 J	0.0016 J
Dihydromethylindene	?					-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	N		300	300		NO	ND										
Ethylidimethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-
Ethylidimethylbenzene (2 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Ethylidimethylbenzene (3 isomers)	?					-	-	-	-	-	-	-	-	-	-	-	-
Ethylmethylbenzene	?					-	-	-	-	-	-	-	-	-	-	-	-
Indane	?					-	-	-	-	-	-	-	-	-	-	-	-
Indene	?					-	-	-	-	-	-	-	-	-	-	-	-
M/P-Xylene	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	N	0.021J	1460	5600		NO	ND	0.021 J	0.0073 J								
Methylbenzofuran (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-
Methylbenzofuran (3 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-
Methylindan	?					NO	-	-	-	-	-	-	-	-	-	-	-
O-Xylene	N		210	210		NO	-	-	-	-	-	-	-	-	-	-	-
Tetramethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-
Toluene	N		104	520		***YES	ND										
Total Xylenes	N		210	210		NO	ND										
Trimethylbenzene	?					NO	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene (2 isomers)	?					NO	-	-	-	-	-	-	-	-	-	-	-

Notes:

USEPA Region 9 Preliminary Remediation Goals (PRGs).
Cancer Risk = 1E-06 and Chronic HQ = 0.2

? No health data evaluation as to carcinogenicity.

Exceeds Highest PRG.

* Background Location

** Impacted Background Location

J = Estimated Value

N = Presumptive Evidence of Presence of Material.

***YES Toluene detected at 0.001 mg/l in Cape Fear River Upgradient of Site.

C = Carcinogen

N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

SW = Surface Water

- = Not Analyzed

ND = Not Detected

**TABLE 8-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	RB-5 1/7/85	BK-S1 1/7/85	SS-1 12/9/92	SS-1 2/15/96	SS-2 12/9/92	SS-3 12/9/92	SS-4 12/9/92	SS-5 12/9/92	SS-6 12/9/92	SS-7 12/9/92	SS-7 2/15/96	SS-8 12/14/92	SS-8 2/15/96	SS-9 12/14/92	SS-9 2/15/96	SS-9 1/19/93	SS-10 1/19/93
Inorganics	N																						
Aluminum	N	1,700	15,200	20,000		***YES	750	1,700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	N	120	0.4	27	41	***YES	ND	ND	3.5	-	5.2	ND	3.6	1.5	ND	2.3	-	ND	-	ND	-	ND	ND
Barium	N		1,080	20,000		***YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N		7.4	162		NO	ND	ND	-	0.97	-	-	-	-	-	-	0.18	-	0.31	-	ND	-	-
Calcium	?					***YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	19	30	64	13,985	***YES	ND	ND	5.5	-	14	2.1	11	5.2	3.1	9.2	-	4.2	-	4.1	-	-	2.6
Cobalt	N		940	20,000		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Extractable Metal)	N		580	15,200		***YES	-	-	-	21	-	-	-	-	-	-	3.0	-	10	-	0.58	-	-
Copper	N	28	580	15,200		***YES	ND	ND	6.1	-	46	8.0	14	2.4	2.8	5.1	-	1.9	-	4.4	-	-	3.9
Cyanide	N		2.2	7		***YES	0.22	0.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	930	4,600	20,000		***YES	1,400	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	6	400	400		***YES	15	6	14	220	290	61	25	3.4	3.1	6.3	22	2.3	54	6.9	5.0	6.2	-
Magnesium	?					***YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N		360	6,400		***YES	20	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N		320	8,200		NO	ND	ND	-	2.8	-	-	-	-	-	-	ND	-	1.5	-	ND	-	-
Potassium	?					***YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	N		78	2,000		NO	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?					***YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N		110	2,800		***YES	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N		4,600	20,000		***YES	ND	ND	-	160	-	-	-	-	-	-	36	-	89	-	6.7	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRG) C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected
 ***YES Inorganics have been detected at background concentrations in ditch, creek and river samples.

**TABLE 8-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present in SW	SS-10A 12/14/92	SS-11 2/15/96	SS-11 2/15/96	SS-12 12/14/96	SS-12 DUP 2/15/96	SS-13 2/15/96	** SS14 2/16/96	SS15 2/16/96	SS16 2/16/96	SS16-DUP 2/16/96	SS17 2/16/96	SS18 2/16/96	SS19 2/16/96	SS20 2/16/96	SS21 2/16/96
Inorganics	N																				
Aluminum	N	1,700	15,200	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	N	120	0.4	27	41	***YES	13	ND	-	4.4	4.9	ND	4.9	6.0	10	12	11	8.6	10	9.7	9.8
Barium	N		1,080	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N		7.4	162		NO	-	-	ND	-	-	-	0.96	-	-	-	-	0.29	-	0.54	-
Calcium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	19	30	64	13,985	***YES	38	1.3	-	2.4	2.4	ND	6.8	19	49	47	65	30	57	37	52
Cobalt	N		940	20,000		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Extractable Metal)	N		580	15,200		***YES	-	-	1.7	-	-	-	ND	-	-	-	-	7	-	7.9	-
Copper	N	28	580	15,200		***YES	34	1.0	-	11	13	16	74	15	32	31	48	17	40	23	42
Cyanide	N		2.2	7		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	930	4,600	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	6	400	400		***YES	-	1.9	5.6	-	-	-	160	-	-	-	-	24	-	23	-
Magnesium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N		360	6,400		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N		320	8,200		NO	-	-	ND	-	-	-	6.0	-	-	-	-	2.4	-	2.6	-
Potassium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	N		78	2,000		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N		110	2,800		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N		4,600	20,000		***YES	-	-	8.9	-	-	-	610	-	-	-	-	100	-	81	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRG) C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected
 ***YES Inorganics have been detected at background concentrations in ditch, creek an

**TABLE 8-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	SS22 2/16/96	SS23 2/16/96	SS24 2/16/96	SD-01 11/10/96	SD-03 11/10/96	SD-05 11/8/96	SD-06 11/9/96	SD-07 11/9/96	SD-08 11/9/96	SD-09 11/9/96	SD-10 11/10/96	SD-11 11/10/96	SD-12 11/10/96	SD-13 11/8/96	SD-14 11/8/96	SD-15 11/8/96	SD-16 11/8/96	SD-17 11/8/96
Inorganics	N	1,700	15,200	20,000		***YES	-	-	-	2,700	15,000	3,100	13,000	28,000	11,000	650	790	26,000	1,900	1,100	3,300	1,200	1,200	1,900
Aluminum	N	120	0.4	27	41	***YES	6.3	5.0	7.6	3.8J	33J	6.2J	30J	29J	20J	ND	2.6J	17J	ND	2.6J	3.5J	2.9J	ND	2.6J
Arsenic	N		1,080	20,000		***YES	-	-	-	46	84	60	83	110	53	4.4	2.8	54	5.8	ND	16	6	3.7	6.6
Barium	N		7.4	162		NO	-	-	-	0.58J	2.1J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	?					***YES	-	-	-	15,000	5,400	2,000	7,800	12,000	6,700	440	360	3,300	480	330	890	460	340	830
Calcium	C	19	30	64	13,985	***YES	25	19	26	14	45	4.9	54	53	52	3.5	2.4J	44	6.1	2.8	6.4	71	9.1	20
Chromium	N		940	20,000		NO	-	-	-	1.4J	7.5J	1J	6.6J	15J	ND	0.47J	0.30J	12J	1.2J	ND	0.84J	1.4J	1.1J	1.1J
Cobalt	N		580	15,200		***YES	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Extractable Metal)	N	28	580	15,200		***YES	19	15	12	29	100	1100	64	94	74	2.6J	3.1J	24	4.3J	3.8J	8J	2.9J	3J	4.8J
Copper	N		2.2	7		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide	N	930	4,600	20,000		***YES	-	-	-	5,900	25,000	7,000	39,000	59,000	20,000	880	710	27,000	2,000	780	2,800	1,600	1,300	1,300
Iron	N	6	400	400		***YES	-	16	-	130	590	69	100	210	120	3.8	13	28	3.9	3.5	11	4.3	2.1	9.3
Lead	?					***YES	-	-	-	950	3,200	220	1,800	3,800	1,800	ND	ND	4,900	400	ND	320	270	250	550
Magnesium	N		360	6,400		***YES	-	-	-	43	110	29	110	160	68	7.2	6.7	210	14	3.5	14	12	11	15
Manganese	N		320	8,200		NO	-	ND	-	ND	ND	ND	ND	ND	13	ND	ND	ND	ND	ND	52	35	18	
Nickel	?					***YES	-	-	-	210	950	ND	800	1,200	840	ND	ND	1,900	260	ND	ND	160	170	310
Potassium	N		78	2,000		NO	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	
Selenium	?					***YES	-	-	-	ND	1,600	290	ND	1,400	1,100	ND	210	3,300	560	ND	ND	ND	270	740
Sodium	N		110	2,800		***YES	-	-	-	13J	63J	5J	49J	85J	50J	10J	2.1J	56	5J	2.4J	8J	3.6J	3.3J	8.7J
Vanadium	N		4,600	20,000		***YES	-	54	-	210	530	82	440	640	340	19	23	120	17	7.8	54	12	11	18
Zinc																								

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRI C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected
 ***YES Inorganics have been detected at background concentrations in ditch, creek an

**TABLE 8-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present in SW	SD-18 11/8/96	SD-19 11/8/96	SD-20 11/8/96	SD-21 1/24/01 F ¹	SD-22 1/24/01 F ¹	SD-23 1/25/01 F ¹	SD-24 1/25/01 F ¹	SD-25 1/24/01 F ¹	SD-26 1/23/01 F ¹	SD-27 1/23/01 F ¹	SD-28 1/23/01 F ¹	SD-29 1/23/01 F ¹	SD-30 1/10/01 F ¹	SD-30-Dup 1/23/01 F ¹	
Inorganics	N																				
Aluminum	N	1,700	15,200	20,000		***YES	890	7,200	1,600	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	N	120	0.4	27	41	***YES	7.1J	ND	ND	ND	ND	6.6	180	6.0	14	9.2	13	ND	ND	8.9	
Barium	N		1,080	20,000		***YES	2.9	16	5.1	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N		7.4	162		NO	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?					***YES	340	920	550	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	19	30	64	13,985	***YES	6	16	5.2	1.9	8.7	12	35	12	23	16	24	3.5	7.8	19	
Cobalt	N		940	20,000		NO	0.37J	1.7J	0.66J	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Extractable Metal)	N		580	15,200		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	28	580	15,200		***YES	2.5J	13	2.8J	9.6	6.4	22	69	19	56	23	40	4.5	5.8	17	
Cyanide	N		2.2	7		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	930	4,600	20,000		***YES	1,600	5,400	2,000	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	6	400	400		***YES	3.2	28	6.7	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?					***YES	210	990	400	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N		360	6,400		***YES	7.5	23	8	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N		320	8,200		NO	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?					***YES	170	470	270	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	N		78	2,000		NO	ND	ND	1.2J	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?					***YES	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N		110	2,800		***YES	4.3J	21	6.7J	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N		4,600	20,000		***YES	7.8	38	14	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRI) C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected
 ***YES Inorganics have been detected at background concentrations in ditch, creek and

**TABLE 8-3. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	SD-31	SD-32	SD-33	SD-34	SD-35	SD-36	SD-37	SD-38	*SD-39	*SD-40	*SD-40-Dup	*SD-41	SD-48	
							1/10/01 F ¹	1/25/01 F ¹	1/25/01 F ¹	1/25/01 F ¹	1/19/01 F ¹	3/22/01 F ¹	3/22/01 F ¹	1/25/01 F ¹	1/25/01 F ¹					
Aluminum	N	1,700	15,200	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	N	120	0.4	27	41	***YES	ND	ND	ND	8.2	ND	8.1	6.4	6.0	5.2	ND	ND	120	1.1	B
Barium	N		1,080	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	N		7.4	162		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	C	19	30	64	13,985	***YES	2.3	3.9	1.8	23	4.9	22	18	21	5.1	0.092 B	0.093 B	19	1.6	
Cobalt	N		940	20,000		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Extractable Metal)	N		580	15,200		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	N	28	580	15,200		***YES	ND	43	ND	65	4.5	23	9.7	11	5.1 B	ND	ND	28	5.7	
Cyanide	N		2.2	7		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	N	930	4,600	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	N	6	400	400		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	N		360	6,400		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	N		320	8,200		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	N		78	2,000		NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	?					***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	N		110	2,800		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	N		4,600	20,000		***YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PR) C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected
 ***YES Inorganics have been detected at background concentrations in ditch, creek an

**TABLE 8-4. PRELIMINARY REMEDIATION GOALS FOR DETECTED SEDIMENT CONSTITUENTS - PESTICIDES AND PCB'S
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameter (mg/kg)	C	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	RB-5 1/7/85	BK-S1 1/7/85	SD-01 11/10/96	SD-01-DUP 11/10/96	SD-05 11/8/96	SD-06 11/9/96	SD-07 11/9/96	SD-08 11/9/96	SD-09 11/9/96	SD-10 11/10/96	SD-11 11/10/96	SD-12 11/10/96	SD-13 11/8/96	SD-14 11/8/96	SD-15 11/8/96	SD-16 11/8/96	SD-17 11/8/96	SD-18 11/8/96	SD-19 11/8/96	SD-20 11/8/96	
4,4'-DDD (P,P'-DDD)	C	0.0059	2.4	17		-	ND	0.0059	ND	ND	0.0071JN	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0078	ND	ND	ND	ND	ND	ND
4,4'-DDE (P,P'-DDE)	C	0.0074	1.7	12		-	ND	0.0074	0.017	0.026	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT (P,P'-DDT)	C		1.7	12		-	ND	ND	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	C/N		0.029	0.15		-	ND	ND	0.0012J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Delta-BHC	C		0.32			-	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00042J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	C/N		0.03	0.15		-	ND	ND	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0014JN	ND	ND	ND	ND	ND	ND
Endosulfan II (Beta)	N		74	1060		-	ND	ND	ND	0.0029J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	N		74	1060		-	ND	ND	ND	ND	ND	0.016JN	ND	ND	ND	ND	ND	ND	ND	ND	0.0026J	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	N		3.6	0.52		-	ND	ND	ND	0.023	ND	ND	ND	ND	ND	0.0012J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00078J
Gamma Chlordane /2	C/N		1.6	11		-	ND	ND	ND	0.027	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00043JN
Methoxychlor	N		62	880		-	ND	ND	ND	ND	0.100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.049	ND
PCB-1260 (Arochlor 1260)			1	1	141	***YES	ND	ND	ND	ND	ND	ND	ND	0.590N	0.170N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
 USEPA Region 9 Preliminary Remediation Goals (PRG: C = Carcinogen
 Cancer Risk = 1E-06 and Chronic HQ = 0.2 N = Non-carcinogen
 ? No health data evaluation as to carcinogenicity. Res = Residential
 Exceeds Highest PRG. Ind = Industrial
 * Background Location S-Spec. = Site Specific
 ** Impacted Background Location SW = Surface Water
 J = Estimated Value - = Not Analyzed
 N = Presumptive Evidence of Presence of Material. ND = Not Detected
 ***YES Detected in background ditch and in Greenfield Creek.

**TABLE 8-5. SEDIMENT SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt)	C	BKGD	Health	Health	S-Spec.	Present		BK-S1DF ¹	SS-1	SS-2	SD-03	SS-3	SS-4	SD-05	SS-5	SD-06DF	SS-6	SD-07DF	SS-7	SS-7-DUP	SD-08	SD-09
2378-TCDD	C	ND	4	27	3,900	-	1	ND	1.59	1.69	ND	0.976	ND	5.37	ND	1.37	7.53	ND	1.83	1.76	0.839	0.612
12378-PeCDD	C	1.73	8	54	7,800	-	0.5	ND	6.0	8.8	0.9	2.08	4.0	38.1	1.1	8.89	77.8	9.60	10.60	10.50	4.27	1.87
123478-HxCDD	C	2.01	40	270	39,000	-	0.1	ND	8.54	18.9	1.11	3.44	4.71	89.9	2.82	38.2	111	42.5	27.1	31.8	9.23	8.65
123678-HxCDD	C	4.52	40	270	39,000	-	0.1	ND	48.5	122	1.97	8.49	148	271	17	455	1360	459	326	520	119	128
123789-HxCDD	C	2.81	40	270	39,000	-	0.1	ND	21.7	39.2	1.5	6.15	55.1	142	4.95	74.6	445	74.7	64.5	80.0	38.9	19.6
1234678-HpCDD	C	148	400	2700	390,000	-	0.01	5.86	1740	6020	72.6	241	1570	10800	933	26200	44100	26100	19400	30600	4410	7190
OCDD	C	1540	4,000	27,000	3,900,000	-	0.001	144	20000	70400	793	2050	12500	111000	13700	261000	469000	330000	217000	320000	50800	83100
2378-TCDF	C	2.29	40	270	3,900	-	0.1	ND	3.25	3.51	ND	0.91	ND	2.02	ND	2.46	7.36	ND	1.83	2.58	1.32	1.4
12378-PeCDF	C	1.96	80	540	78,000	-	0.05	ND	4.25	4.69	ND	0.963	10.7	9.34	0.665	12.0	69.1	9.23	7.51	11.9	4.6	3.72
23478-PeCDF	C	5.46	8	54	7,800	-	0.5	ND	20	64.8	1.46	13.4	20.5	26.4	1.47	32.6	171	24.1	21.7	32.7	20.2	10.4
123478-HxCDF	C	2.24	40	270	39,000	-	0.1	ND	24.2	35.7	0.9	3.22	158	103	5.39	133	984	103	85	126	62.9	28.8
123678-HxCDF	C	2.7	40	270	39,000	-	0.1	ND	30.5	27.4	0.786	5.31	72.1	74.7	2.13	42.9	323	34.2	27.4	38.7	23.7	10.3
234678-HxCDF	C	4	40	270	39,000	-	0.1	ND	28.8	58.6	1.32	11.6	70.8	101	3.36	69.7	499	66.0	50.1	73.2	40.0	17.3
123789-HxCDF	C	ND	40	270	39,000	-	0.1	ND	8.02	12.1	ND	1.33	58.8	35.5	1.79	39.9	362	32.6	27.4	40.2	21	10
1234678-HpCDF	C	55.3	400	2700	390,000	-	0.01	1.44	1630	1480	7.44	70.7	15600	7100	389	8310	83900	5860	5740	8080	5420	2050
1234789-HpCDF	C	1.35	400	2700	390,000	-	0.01	ND	22	36.8	ND	4.43	123	112	5.69	173	979	172	111	165	58.9	37.6
OCDF	C	76.4	4,000	27,000	3,900,000	-	0.001	3.01	1560	3030	25.8	144	13100	5830	648	7060	77000	12300	10800	15400	4940	3330
Total TCDDs	C	5.28				-		ND	23.6	16.3	ND	7.36	14.5	48.7	ND	16.7	207	9.19	61.6	30.1	27.1	6.07
Total PeCDDs	C	20.5				-		ND	59.8	128	2.42	27.0	112	356	12.6	178	1570	144	266	255	99.3	40.1
Total HxCDDs	C	62.4				-		2.67	615	1690	20.5	95.1	1480	4260	288	7050	15700	6210	5180	7440	1530	1510
Total HpCDDs	C	593				-		18.4	7290	31000	177	555	6090	57400	5530	146000	237000	167000	118000	197000	25300	42600
Total TCDFs	C	42.5				-		ND	74.4	207	3.86	50.3	7.10	63.3	ND	33.7	160	14.3	30.8	46.3	44.8	19.4
Total PeCDFs	C	51.6				-		3.01	210	686	14.3	154	173	370	10.3	273	1310	232	176	265	200	84.8
Total HxCDFs	C	51.1				-		3.39	900	1360	16.1	148	6530	4060	193	5690	40300	3810	3320	4810	2560	1120
Total HpCDFs	C	117				-		3.21	3130	3800	21.7	162	28400	15000	844	23100	169000	17900	15300	22100	10700	5330
Dilution Factor						-		1	1	1	1	1	1	1	1	10	10	1	10	10	1	10
2378-TCDD TEQ			4	27	4,000			0	88	219	4	18	268	417	33	723	2,380	762	560	839	200	209

NOTES:
 Results are parts per trillion (ppt) by U.S. EPA Method 1613.
 USEPA Region 9 Preliminary Remediation Goals (PRGs).
 TEF, TEQ = Toxicity equivalence factor, Toxicity equivalence quotient.
 TEQ calculated using zero for not-detected (ND).
Italic results are Estimated Possible Maximum Concentrations (EMPC).
EMPC detection meets all QA/QC requirements except ion concentration.
Interferences may mask the result or constituent may or may not be present.
¹ Background Greenfield Creek ² Background Cape Fear River
³ Background Drainage Ditch ⁴ Background Wetland.
 Cancer Risk=1E-06 & Chronic HQ=0.2
Exceeds Highest PRG.
 SW = Surface Water C = Carcinogen
 - = Not Analyzed N = Non-carcinogen
 ND = Not Detected Res = Residential
 Ind = Industrial
 S-Spec. = Site Specific

**TABLE 8-5. SEDIMENT SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt)	C	BKGD	Health	Health	S.Spec.	Present		SS-9DF	SD-10	SS-10A-DF	SD-11	SS-11	SS-12	SD-13	SS-13	SD-14	SD-15	SS-15	SD-16	SS-16DF	SD-17	SS-17	SD-18
2378-TCDD	C	ND	4	27	3,900	-	1	0.348	0.566	1.63	1.11	0.225	1.0	8.2	0.7	ND	4.8	0.145	0.721	0.394	ND	ND	ND
12378-PeCDD	C	1.73	8	54	7,800	-	0.5	1.35	2.02	7.07	2.67	1.35	2.72	70.3	1.31	7.12	58.5	0.197	1.93	2.27	ND	0.119	1.41
123478-HxCDD	C	2.01	40	270	39,000	-	0.1	4.65	4.37	25.1	5.43	9.41	3.79	240	2.24	19.2	150	0.38	3.88	7.17	ND	0.474	3.08
123678-HxCDD	C	4.52	40	270	39,000	-	0.1	77.0	24.1	410	74.1	98.0	17.1	562	24.9	148	331	1.11	8.5	24.4	1.42	1.77	10.2
123789-HxCDD	C	2.81	40	270	39,000	-	0.1	11.3	11.3	62.1	18	16.1	12.2	270	8.39	47.6	323	0.786	8.21	11.5	0.726	0.677	5.18
1234678-HpCDD	C	148	400	2700	390,000	-	0.01	4350	1060	21700	5030	5410	577	22800	882	6970	12200	43.2	264	1150	43	114	429
OCDD	C	1540	4,000	27,000	3,900,000	-	0.001	49000	12500	261000	54800	54000	8980	210000	10200	91000	103000	579	2080	10600	493	1260	4860
2378-TCDF	C	2.29	40	270	3,900	-	0.1	ND	1.46	3.00	2.65	0.922	1.17	6.39	1.10	2.46	2.31	0.28	ND	0.294	ND	0.218	0.658
12378-PeCDF	C	1.98	80	540	78,000	-	0.05	1.31	1.01	9.57	2.45	3.53	1.02	21.8	1.38	6.06	6.84	0.115	0.464	0.627	0.286	0.0959	0.711
23478-PeCDF	C	5.46	8	54	7,800	-	0.5	4.49	3.9	28.8	6.85	9.44	7.6	33.8	5.5	19.9	14.2	0.3	0.770	1.91	0.428	0.251	2.26
123478-HxCDF	C	2.24	40	270	39,000	-	0.1	19.4	7.84	79.0	21.6	35	4.3	139.0	8.4	60.3	50.4	0.4	1.44	9.00	0.631	0.87	3.41
123678-HxCDF	C	2.7	40	270	39,000	-	0.1	5.47	4.55	27.6	18.5	9.59	9.42	107	20.2	23.7	40.7	0.326	1.53	4.35	0.631	0.356	2.03
1234678-HxCDF	C	4	40	270	39,000	-	0.1	10.2	7.86	50.6	21.3	18	6.59	165	11.2	38.5	89.8	0.478	2.41	9.12	0.666	0.518	3.76
123789-HxCDF	C	ND	40	270	39,000	-	0.1	6.08	2.21	27.1	6.65	12.4	1.56	37.3	2.83	21.1	13.3	ND	ND	2.81	ND	0.244	ND
1234678-HpCDF	C	55.3	400	2700	390,000	-	0.01	1550	585	5720	1900	3140	233	6500	712	4240	2650	11.9	52.9	526	17.4	28.5	171
1234789-HpCDF	C	1.35	400	2700	390,000	-	0.01	31.9	7.78	92.1	28.3	38.9	3.8	178	9.62	56.9	99.4	0.408	2.03	15.7	ND	0.797	3.66
OCDF	C	76.4	4,000	27,000	3,900,000	-	0.001	3600	721	10600	1870	2700	252	7210	712	4360	5330	15.8	112	808	26.7	46.5	284
Total TCDDs	C	5.28				-		1.78	15.8	38.2	32.1	5.12	46.6	192	29.5	45	58.5	1.91	3.74	5.55	ND	0.202	1.37
Total PeCDDs	C	20.5				-		29.4	33.8	135	82.3	39.6	65.6	755	40.3	189	302	2.99	15.1	18	1.11	1.25	13.3
Total HxCDDs	C	62.4				-		1080	362	4720	1690	1310	353	7330	307	2580	2920	21.6	88.4	219	14.1	36.7	136
Total HpCDDs	C	593				-		27100	5420	132000	47900	34300	2480	99700	3900	45300	35100	183	689	4080	139	838	1730
Total TCDFs	C	42.5				-		8.5	22.0	52.4	28.3	9.73	27.1	192	25.3	50.4	53.6	1.95	1.18	4.44	ND	0.778	5.24
Total PeCDFs	C	51.6				-		46.1	48.4	250	58.0	65.9	63.1	697	63.8	211	239	2.32	7.26	21.3	1.93	1.84	19.5
Total HxCDFs	C	51.1				-		863	312	3330	1030	1460	179	4580	377	2290	1860	8.46	41.8	279	10.6	17.5	105
Total HpCDFs	C	117				-		4780	1210	16100	4400	6930	497	16300	1390	9130	6440	27.0	121	1230	36.4	69.1	377
Dilution Factor						-		1	1	1	50	1	1	5	1	10	1	1	1	1	1	1	1
2378-TCDD TEQ			4	27	4,000			129	40	635	149	168	29	726	39	258	399	2	10	38	2	3	16

NOTES:

Results are parts per trillion (ppt) by U.S. EPA Method 1613.

USEPA Region 9 Preliminary Remediation Goals (PRGs).

TEF; TEQ = Toxicity equivalence factor, Toxicity equivalence quotient.

TEQ calculated using zero for not-detected (ND).

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concentration.

Inferences may mask the result or constituent may or may not be present.

¹ Background Greenfield Creek

² Background Cape Fear River

³ Background Drainage Ditch

⁴ Background Wetland.

Cancer Risk=1E-06 & Chronic HQ=0.2

C = Carcinogen

Exceeds Highest PRG.

N = Non-carcinogen

SW = Surface Water

Res = Residential

- = Not Analyzed

Ind = Industrial

ND = Not Detected

S-Spec. = Site Specific

**TABLE 8-5. SEDIMENT SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	C N	BKGD PRG	Health Res. PRG	Health Ind. PRG	S-Spec. Ind. PRG	Present In SW	TEF	SD-18-DUP	SS-18	SD-19	SS-19DF	SD-20	SS-20	SD-21	SS-21DF	SD-22	SS-22	SD-23	SS-23DF	SD-24	SS-24	SD-25
								1/25/01	1/11/01	1/25/01	10/24/00	1/23/01	1/11/01	1/24/01	10/24/00	1/24/01	1/11/01	1/25/01	10/24/00	1/25/01	1/11/01	1/25/01
2378-TCDD	C	ND	4	27	3,900	-	1	0.830	0.244	1.08	0.431	2.09	0.772	ND	ND	ND	ND	6.36	ND	5.83	0.945	3.2
12378-PeCDD	C	1.73	8	54	7,800	-	0.5	1.30	0.895	3.63	2.53	8.71	2.16	ND	0.285	0.547	0.197	35.6	ND	19.3	ND	16.4
123478-HxCDD	C	2.01	40	270	39,000	-	0.1	3.00	3.02	9.19	7.28	24.3	4.38	0.921	0.420	0.929	ND	111	4.39	57.2	0.101	51
123678-HxCDD	C	4.52	40	270	39,000	-	0.1	9.43	34.6	60.2	64.9	197	45.8	1.39	3.37	1.88	2.46	474	5.14	257	0.265	305
123789-HxCDD	C	2.81	40	270	39,000	-	0.1	5.37	6.75	18.8	16.9	53.2	15.2	1.16	0.987	1.19	1.12	187	0.801	104	0.227	84.4
1234678-HpCDD	C	148	400	2700	390,000	-	0.01	429	1670	2950	1890	9920	2240	42.5	163	61.3	53.2	29000	229	13100	6.76	19900
OCDD	C	1540	4,000	27,000	3,900,000	-	0.001	4690	16600	34000	22400	111000	24600	496	2100	713	613	308000	3050	150000	95.5	220000
2378-TCDF	C	2.29	40	270	3,900	-	0.1	0.600	0.559	1.58	0.372	5.5	1.66	ND	ND	ND	0.251	3.98	ND	ND	0.185	6.36
12378-PeCDF	C	1.96	80	540	78,000	-	0.05	0.804	0.732	1.96	3.74	6.69	2.1	0.476	0.195	0.328	0.153	12.2	ND	8.72	ND	6.75
23478-PeCDF	C	5.46	8	54	7,800	-	0.5	2.09	3.47	8.34	11.6	20.4	6.27	1.13	0.488	1.43	0.388	29.3	0.295	20.6	0.129	19
123478-HxCDF	C	2.24	40	270	39,000	-	0.1	3.31	10.40	21.80	82.6	69.7	18.2	0.932	1.69	0.71	1.67	109	0.909	68.4	0.0824	73.5
123678-HxCDF	C	2.7	40	270	39,000	-	0.1	2.02	4.57	9.25	25.1	39.8	10.6	0.932	0.75	0.842	0.565	62.1	0.353	55.1	0.0804	28.2
234678-HxCDF	C	4	40	270	39,000	-	0.1	3.64	9.3	17.5	45.6	54	14.4	1.07	1.14	1.58	0.881	114	0.590	65.9	0.121	53.9
123789-HxCDF	C	ND	40	270	39,000	-	0.1	1.33	2.38	6.06	28.7	20.6	5.91	ND	0	ND	0.569	33.3	ND	22.7	ND	19.7
1234678-HpCDF	C	55.3	400	2700	390,000	-	0.01	147	390	1300	7700	4900	1410	4.88	ND	9.67	161	6110	74.8	3970	1.5	3530
1234789-HpCDF	C	1.35	400	2700	390,000	-	0.01	ND	13.5	25.6	51.2	81.4	19.5	ND	1.75	0.536	1.39	162	1.50	89.90	0.0623	117.0
OCDF	C	76.4	4,000	27,000	3,900,000	-	0.001	260	904	2340	6770	6820	1260	11.1	160	23.2	135	8560	150	6250	2.37	10700
Total TCDDs	C	5.28				-		2.90	10.2	9.63	5.12	42.9	35.9	ND	0.428	ND	1.19	88.6	1.01	38.5	0.603	60.4
Total PeCDDs	C	20.5				-		14.0	33.0	44.4	32.4	157	78.1	ND	4.36	2.28	3.11	498	2.92	280	0.866	346
Total HxCDDs	C	62.4				-		131	477	826	690	2900	801	12.5	61.3	19.4	33.9	8820	60.3	4090	4.72	5200
Total HpCDDs	C	593				-		1720	8960	16400	11700	56000	15700	97.8	1320	183	256	182000	1340	72700	21.3	105000
Total TCDFs	C	42.5				-		4.88	8.22	22.6	10.9	76.4	23.4	0.942	1.32	3.87	1.17	74.9	ND	34.3	0.836	81.6
Total PeCDFs	C	51.6				-		17.8	26.2	76.6	94.6	233	50.1	8.28	3.99	15.7	3.12	372	1.34	227	1.17	196
Total HxCDFs	C	51.1				-		94.9	299	765	3050	2630	709	11.3	70.5	18.6	65.4	4190	36.1	2480	1.97	2540
Total HpCDFs	C	117				-		329	1350	3270	14900	11000	3090	12.0	311	25.7	294	16900	187	9870	3.68	11700
Dilution Factor						-		1	5	1	1	5	10	1	1	1	1	5	1	1	1	10
2378-TCDD TEQ			4	27	4,000			15	48	101	160	330	79	2	5	3	4	818	8	417	1	551

NOTES:

Results are parts per trillion (ppt) by U.S. EPA Method 1613.

USEPA Region 9 Preliminary Remediation Goals (PRGs).

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

TEQ calculated using zero for not-detected (ND).

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concentration.

Interferences may mask the result or constituent may or may not be present.

¹ Background Greenfield Creek

² Background Cape Fear River

³ Background Drainage Ditch

⁴ Background Wetland.

Cancer Risk=1E-06 & Chronic HQ=0.2

C = Carcinogen

Exceeds Highest PRG.

N = Non-carcinogen

SW = Surface Water

Res = Residential

- = Not Analyzed

Ind = Industrial

ND = Not Detected

S-Spec. = Site Specific

**TABLE 8-5. SEDIMENT SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt)	C	BKGD	Health	Health	S-Spec.	Present	TEF	SD-26	SD-27	SD-28	SD-29	SD-30	SD-30-DUP	SD-31	SD-32	SD-33	SD-34	SD-35	SD-36	SD-37	SD-38	SD-39 ⁴
		N	PRG	Res. PRG	Ind. PRG	Ind. PRG		in SW	1/23/01	1/23/01	1/23/01	1/23/01	1/10/01	1/23/01	1/10/01	1/10/01	1/10/01	1/10/01	1/10/01	1/10/01	1/25/01	1/25/01
2378-TCDD	C	ND	4	27	3,900	-	1	5.12	3.79	3.66	0.504	0.221	1.24	ND	0.228	0.11	2.51	0.342	ND	ND	1.58	ND
12378-PeCDD	C	1.73	8	54	7,800	-	0.5	61.8	29.4	33.9	2.35	0.66	8.64	0.322	1.46	0.329	10.6	2.11	9.35	8.01	5.28	1.73
123478-HxCDD	C	2.01	40	270	39,000	-	0.1	246	61	406	9.85	2.1	9.13	0.979	6.05	1.48	34.7	9.84	25.4	18.9	12.6	2.01
123678-HxCDD	C	4.52	40	270	39,000	-	0.1	3260	864	4580	116	24.7	269	10.1	59.3	15.9	347	153	108	94	83.2	3.71
123789-HxCDD	C	2.81	40	270	39,000	-	0.1	672	218	459	19.7	6.88	82	2.51	13.5	2.78	80.1	21	48.2	39.5	32.9	2.81
1234678-HpCDD	C	148	400	2700	390,000	-	0.01	182000	32300	268000	6810	1190	4330	563	3260	978	17200	9600	4850	3770	2870	43.8
OCDD	C	1540	4,000	27,000	3,900,000	-	0.001	1880000	356000	2360000	77100	14200	42600	6890	33900	11700	182000	81700	52800	43200	31600	489
2378-TCDF	C	2.29	40	270	3,900	-	0.1	8,000	5,340	21,800	0.861	0.436	4.07	0.292	0.936	0.266	5	0.995	3.79	1.76	1.78	2.29
12378-PeCDF	C	1.96	80	540	78,000	-	0.05	99.2	44.4	95.6	2.84	0.78	16.9	0.316	1.76	0.285	12.4	3.13	3.75	3.85	4.28	1.96
23478-PeCDF	C	5.48	8	54	7,800	-	0.5	285	99.7	244	8.64	2.78	127	1.26	6.25	0.817	39	15	11.8	10	10.7	5.48
123478-HxCDF	C	2.24	40	270	39,000	-	0.1	1850	613	770	32	8.8	275	3.44	15.1	2.81	127	39.5	35.8	35	43.6	2.24
123678-HxCDF	C	2.7	40	270	39,000	-	0.1	475	171	209	12.9	3.79	96.3	1.5	5.94	0.861	73.4	11.4	20.3	20.3	20.4	2.70
234678-HxCDF	C	4	40	270	39,000	-	0.1	784	273	446	19.4	5.23	171	2.41	10.2	1.74	86.3	22.8	37.1	31.1	34.7	4.0
123789-HxCDF	C	ND	40	270	39,000	-	0.1	598	216	257	10	2.66	106	1.01	4.59	0.839	40.8	12.3	11.2	11.3	15.7	ND
1234678-HpCDF	C	55.3	400	2700	390,000	-	0.01	144000	55300	52300	2190	709	27500	233	1030	169	10200	2720	2100	2430	3640	12.9
1234789-HpCDF	C	1.35	400	2700	390,000	-	0.01	1620	560	1250	41.50	9.13	232.00	4.00	18.10	4.23	139	43.40	40.6	39.4	42.4	ND
OCDF	C	76.4	4,000	27,000	3,900,000	-	0.001	136000	55300	100000	3790	947	23600	427	1780	480	10300	5900	2830	2650	3040	15.3
Total TCDDs	C	5.28				-		114	86.4	12.8	6.29	28.8	50.4	1.86	5.99	0.659	35.6	9.74	22.5	24.8	36.9	5.28
Total PeCDDs	C	20.5				-		1490	664	733	46.8	34.0	220.0	6.22	27.4	5.22	201	44.9	142	134	105	20.5
Total HxCDDs	C	62.4				-		42500	9650	54100	1520	356	2630	141	799	205	4300	1810	1610	1340	1150	42.5
Total HpCDDs	C	593				-		1110000	183000	1700000	41900	6670	21000	3280	18900	5630	93500	54700	24400	20100	15300	123
Total TCDFs	C	42.5				-		203	95.2	161	15.7	7.48	264	3.93	15.6		106	29.6	42.9	33.5	36.5	42.5
Total PeCDFs	C	51.6				-		2180	726	1550	80.3	28.3	491	13.3	62.9	7.90	396	122	147	120	126	51.6
Total HxCDFs	C	51.1				-		68700	23500	32300	1250	354	12300	128	610	114	4920	1500	1200	1230	1760	38.5
Total HpCDFs	C	117				-		317000	109000	162000	5590	1570	51300	569	2570	543	21600	7490	4710	5130	7020	23.4
Dilution Factor						-		10	1	10	5	1	5	1	5	1	10	50	1	1	1	1
2378-TCDD TEQ			4	27	4,000			6,169	1,567	6,490	197	42	558	18	94	27	575	247	165	143	134	7

NOTES:

Results are parts per trillion (ppt) by U.S. EPA Method 1613.

USEPA Region 9 Preliminary Remediation Goals (PRGs).

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

TEQ calculated using zero for not-detected (ND).

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concentration.

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Cancer Risk=1E-06 & Chronic HQ=0.2

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SW = Surface Water

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ND = Not Detected

S-Spec. = Site Specific

**TABLE 8-5. SEDIMENT SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	C	BKGD	Health	Health	S-Spec.	Present	TEF	SD-40DF ²	SD-40DF-DUP ²	SD-41DF ³
		N	PRG	Res. PRG	Ind. PRG	Ind. PRG		In SW	10/24/00	10/24/00
2378-TCDD	C	ND	4	27	3,900	-	1	ND	ND	ND
12378-PeCDD	C	1.73	8	54	7,800	-	0.5	ND	ND	0.782
123478-HxCDD	C	2.01	40	270	39,000	-	0.1	ND	0.160	1.14
123678-HxCDD	C	4.52	40	270	39,000	-	0.1	0.353	0.419	4.52
123789-HxCDD	C	2.81	40	270	39,000	-	0.1	ND	0.360	2.72
1234678-HpCDD	C	148	400	2700	390,000	-	0.01	12.4	14.2	148
OCDD	C	1540	4,000	27,000	3,900,000	-	0.001	181	209	1540
2378-TCDF	C	2.29	40	270	3,900	-	0.1	ND	ND	0.381
12378-PeCDF	C	1.96	80	540	78,000	-	0.05	ND	ND	0.442
23478-PeCDF	C	5.46	8	54	7,800	-	0.5	0.459	0.492	3.29
123478-HxCDF	C	2.24	40	270	39,000	-	0.1	0.185	0.203	1.32
123678-HxCDF	C	2.7	40	270	39,000	-	0.1	0.179	0.189	1.53
234678-HxCDF	C	4	40	270	39,000	-	0.1	0.323	0.354	3.28
123789-HxCDF	C	ND	40	270	39,000	-	0.1	ND	ND	ND
1234678-HpCDF	C	55.3	400	2700	390,000	-	0.01	2.74	2.88	55.3
1234789-HpCDF	C	1.35	400	2700	390,000	-	0.01	ND	ND	1.35
OCDF	C	76.4	4,000	27,000	3,900,000	-	0.001	6.85	7.96	76.4
Total TCDDs	C	5.28				-		0.185	ND	5.11
Total PeCDDs	C	20.5				-		0.408	0.695	11.1
Total HxCDDs	C	62.4				-		2.08	3.25	62.4
Total HpCDDs	C	593				-		47.3	56.1	593
Total TCDFs	C	42.5				-		0.560	1.14	13.2
Total PeCDFs	C	51.8				-		3.55	4.67	35.9
Total HxCDFs	C	51.1				-		4.53	4.48	51.1
Total HpCDFs	C	117				-		7.12	7.67	117
Dilution Factor						-		1	1	1
2378-TCDD TEQ			4	27	4,000			1	1	7

NOTES:

Results are parts per trillion (ppt) by U.S. EPA Method 1613.

USEPA Region 9 Preliminary Remediation Goals (PRGs).

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

TEQ calculated using zero for not-detected (ND).

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concentration.

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Cancer Risk=1E-06 & Chronic HQ=0.2

C = Carcinogen

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SW = Surface Water

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ND = Not Detected

S-Spec. = Site Specific

TABLE 9-1. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE WATER CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY

Parameters (mg/L)	SW	RB-W	BK-W1	SW-1	SW-2	SW-3	SW-4	SW-4 Dup	SW-5	SW-01	SW-01-Dup	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09
Inorganics	PRG	1/7/85	1/7/85	2/15/96	2/15/96	2/15/96	2/15/96	2/15/96	2/15/96	11/10/96	11/10/96	11/9/96	11/9/96	11/9/96	11/9/96	11/10/96	11/10/96	11/10/96
Aluminum		1.0	0.5	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.009J	ND	ND	ND	ND	ND
Barium	1	ND	ND	-	-	-	-	-	-	0.065	0.072	0.030	0.033	0.034	0.036	0.027	0.028	0.027
Calcium		41	23	-	-	-	-	-	-	65	70	32	35	35	38	30	28	37
Chromium	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.003J	ND	ND	ND	ND	ND	ND	ND
Copper	0.003	ND	ND	ND	ND	ND	ND	ND	ND	0.020J	0.020J	0.017J	0.015J	0.023J	0.015J	0.022J	0.015J	0.015J
Cyanide	0.005	ND	0.04	-	-	-	-	-	-	ND	0.017	ND	ND	ND	ND	ND	ND	ND
Iron	1	2.4	0.68	-	-	-	-	-	-	5.1	4.7	0.440	0.650	0.450	1.4	0.940	1.3	0.830
Lead	0.025	ND	ND	-	-	-	-	-	-	0.006	0.009	ND	ND	0.004	0.003	ND	ND	ND
Magnesium		100	ND	-	-	-	-	-	-	6.0	6.4	2.4	2.8	2.6	3.9	68	64	96
Manganese	0.2	0.13	0.02	-	-	-	-	-	-	0.51	560	0.022	0.029	0.027	0.068	0.066	0.073	0.073
Potassium		36	ND	-	-	-	-	-	-	3.1	3.6	2.2	2.4	2.4	2.9	43	39	57
Sodium		930	10	-	-	-	-	-	-	16	19	8.1	9.4	8.9	17	550	520	690
Vanadium		ND	ND	-	-	-	-	-	-	0.001J	ND	ND	ND	0.002J	0.002J	0.002J	0.003J	ND
Zinc	0.05	ND	ND	-	-	-	-	-	-	0.042	0.034	0.028	0.028	0.033	0.026	0.033	0.039	0.037

Notes:
Standards are the lower of NCAC 2B .100 for Class C and WS-IV for freshwater and Class SC for tidal saltwater.
* Background Location
J Estimated Value
ND Not Detected
- Not Analyzed
SW Surface Water
PRG Preliminary Remediation Goal
Shaded Cells Exceed PRG

**TABLE 9-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED SURFACE WATER CONSTITUENTS - PESTICIDES AND PCBs
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/L)	SW	RB-W	BK-W1	SW-01	SW-01-Dup	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09
Pesticides/PCB Compounds	PRG	1/7/85	1/7/85	11/10/96	11/10/96	11/9/96	11/9/96	11/9/96	11/9/96	11/10/96	11/10/96	11/10/96
PCB-1260 (Aroclor 1260)	0.000001	ND	ND	0.0010J	0.0010J	ND	0.00033J	0.0019	0.0094	0.00055J	0.00015J	ND
Alpha-Chlordane /2	0.000004	-	-	0.000050J	0.000050J	ND	ND	ND	0.000064	ND	ND	ND

Notes:

Standards are the lower of NCAC 2B .100 for Class C and WS-IV for freshwater and Class SC for tidal saltwater.

- * Background Location
- J Estimated Value
- ND Not Detected
- Not Analyzed
- SW Surface Water
- PRG Preliminary Remediation Goal
- Shaded Cells Exceed PRG**

**TABLE 10.1. PRELIMINARY REMEDIATION GOALS FOR DETECTED FISH CONSTITUENTS - SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C		Health	S-Spec.	Present	BIO-13B-Dup
Extractable Organics	N	BKGD	Res. RBC	Ind. RBC	in SW	4/24/01
Acenaphthene	N	ND	81		NO	2.8
Dibenzofuran	N	ND	5.4		NO	1.8
Fluorene	N	ND	54		NO	1.5
Fish Specie						Shad
Location						Greenfield Creek

Notes:

ND = Not-Detected

NA = Not Analyzed

USEPA Region 3 Risk Based Concentrations (RBC).

Exceeds RBC.

C = Carcinogen

N = Non-carcinogen

**TABLE 10-2. PRELIMINARY REMEDIATION GOALS FOR DETECTED FISH CONSTITUENTS - INORGANICS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Parameters (mg/kg)	C	BKGD	Health RBC	S-Spec. RBC	Present in SW	*BIO-15-Comp-Dup 4/25/01	BIO-16-Comp 4/23/01	BIO-12B 4/23/01	BIO-13A 4/24/01
Inorganics	N								
Chromium	C/N	ND	4.2		**YES	ND	ND	1.4	ND
Copper	N	2.0	540		**YES	2.0	2.7	3.2	27
Fish Specie						Small Fish	Small Fish	Mullet	Bowfin
Location						Burnt Mill Creek	Up Greenfield Creek	Greenfield Creek	

Notes:

ND = Not-Detected

NA = Not Analyzed

* Background

USEPA Region 3 Risk Based Concentrations (RBC).

Exceeds RBC.

**YES Inorganics have been detected at background concentrations in ditch, creek and river samples.

Cancer Risk=1E-06 & Chronic HQ=0.2

C = Carcinogen

N = Non-carcinogen

**TABLE 10-3. FISH SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	C N	BKGD	Health RBC	S-Spec. Health RBC	Present in SW	TEF	BIO-14-COMP	BIO-15-COMP	*BIO-15-Comp-Dup	BIO-16-Comp	*BIO-10B	*BIO-10D	*BIO-10E	*BIO-11A	*BIO-11B	*BIO-11C	*BIO-11C-Dup
							4/24/01	4/25/01	4/25/01	4/23/01	4/23/01	4/23/01	4/23/01	4/25/01	4/25/01	4/25/01	4/25/01
2378-TCDD	C	0.593	0.021	30	-	1	0.34	0.246	ND	ND	ND	ND	0.593	ND	ND	ND	0.330
12378-PeCDD	C	0.3	0.042	60	-	0.5	0.913	0.194	0.142	0.130	ND	0.2	0.3	0.182	ND	ND	0.233
123478-HxCDD	C	ND	0.21	300	-	0.1	1.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
123678-HxCDD	C	0.297	0.21	300	-	0.1	6.42	0.297	0.177	ND	ND	ND	ND	ND	ND	ND	ND
123789-HxCDD	C	ND	0.21	300	-	0.1	2.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1234678-HpCDD	C	3.13	2.1	3000	-	0.01	311	1.56	1.51	1.20	ND	0.763	0.947	0.967	3.13	1.12	1.65
OCDD	C	36.5	21	30000	-	0.001	4190	12.3	12.5	9.76	2.77	2.69	3.76	5.14	36.5	10.2	9.82
2378-TCDF	C	1.07	0.21	300	-	0.1	0.450	ND	ND	0.492	0.483	0.203	1.07	ND	ND	ND	ND
12378-PeCDF	C	0.116	0.42	600	-	0.05	0.221	0.0943	ND	ND	ND	0.0903	ND	0.0993	0.0822	ND	0.116
23478-PeCDF	C	0.307	0.042	60	-	0.5	0.544	0.128	0.114	0.190	ND	0.229	0.270	0.18	0.228	0.194	0.307
123478HxCDF	C	0.324	0.21	300	-	0.1	1.24	0.0884	ND	ND	ND	0.109	ND	0.163	ND	ND	0.324
123678-HxCDF	C	0.271	0.21	300	-	0.1	0.653	0.0707	ND	ND	ND	ND	ND	0.112	ND	ND	0.271
234678-HxCDF	C	0.408	0.21	300	-	0.1	1.01	0.104	ND	ND	ND	ND	ND	0.146	0.312	ND	0.408
123789-HxCDF	C	ND	0.21	300	-	0.1	0.313	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1234678-HpCDF	C	1.42	2.1	3000	-	0.01	56.1	0.242	0.347	0.349	ND	0.30	ND	0.330	1.20	0.270	1.42
1234789-HpCDF	C	ND	2.1	3000	-	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OCDF	C	1.93	21	30000	-	0.001	171	0.523	0.545	ND	ND	ND	ND	ND	1.93	ND	0.915
Total TCDDs	C	0.593			-		0.34	0.246	ND	ND	ND	ND	0.593	ND	ND	ND	0.330
Total PeCDDs	C	0.81			-		1.97	0.194	ND	0.13	ND	0.214	0.262	0.182	0.297	ND	0.810
Total HxCDDs	C	1.2			-		81.0	0.66	0.420	ND	ND	ND	ND	ND	1.2	0.181	0.524
Total HpCDDs	C	10.6			-		1880	3.08	3.63	2.63	0.545	0.763	0.947	2.14	10.6	0.260	3.71
Total TCDFs	C	1.07			-		0.45	ND	ND	0.492	0.483	0.203	1.070	ND	ND	ND	ND
Total PeCDFs	C	0.67			-		3.24	0.222	0.114	0.368	ND	0.229	0.587	0.279	0.507	0.234	0.671
Total HxCDFs	C	2.45			-		34.6	0.336	0.425	0.202	ND	ND	0.307	0.163	1.01	ND	2.45
Total HpCDFs	C	2.24			-		167	0.472	0.347	0.674	ND	0.304	ND	0.330	2.24	0.270	1.42
Dilution Factor					-		1	1	1	1	1	1	1	1	1	1	1
2378-TCDD TEQ (ND=0)				30			10.46	0.50	0.18	0.23	0.05	0.27	0.98	0.25	0.23	0.12	0.75
2378-TCDD TEQ (ND=1/2)				30			10.50	0.53	0.30	0.42	0.44	0.46	1.05	0.44	0.49	0.34	0.83
Fish Species							Small Fish	Small Fish	Small Fish	Small Fish	Sunfish	Largemouth	Bowfin	Largemouth	Mullet	Sunfish	Sunfish
Location							Greenfield C.	Burnt Mill C.	Burnt Mill C.	Up Greenfield C.	Greenfield Lake			Burnt Mill Creek			

NOTES:

All results are in parts per trillion (ppt) by U.S. EPA Method 1613.

USEPA Region 3 Risk Based Concentrations (RBC).

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concn

Inferences may mask the result or constituent may or may not be present.

Exceeds Highest RBC.

- C = Carcinogen
- SW = Surface Water
- = Not Analyzed
- ND = Not Detected
- NA = Not Applicable
- BKGD = Background
- N = Non-carcinogen
- Res = Residential
- Ind = Industrial
- S-Spec. = Site Specific
- * Background Sample

**TABLE 10-3. FISH SAMPLES - DIOXINS/FURANS
SOUTHERN WOOD PIEDMONT AND NORTH CAROLINA STATE PORTS AUTHORITY**

Analytes (ppt) Dioxins/Furans	C N	BKGD	Health RBC	S-Spec. Health RBC	Present In SW	TEF	BIO-12A	BIO-12B	BIO-13A	BIO-13B	BIO-13B-Dup	BIO-13C	BIO-13D	BIO-13E	BIO-13E-Dup
							4/23/01	4/23/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01
2378-TCDD	C	0.593	0.021	30	-	1	ND	ND	ND	0.227	0.394	0.216	0.265	0.629	0.339
12378-PeCDD	C	0.3	0.042	60	-	0.5	0.286	ND	0.356	0.175	0.381	0.279	0.539	1.01	0.304
123478-HxCDD	C	ND	0.21	300	-	0.1	ND	ND	0.242	ND	0.154	0.347	0.175	0.483	ND
123678-HxCDD	C	0.297	0.21	300	-	0.1	0.594	0.399	0.797	0.985	1.56	0.693	0.951	2.41	0.284
123789-HxCDD	C	ND	0.21	300	-	0.1	ND	0.357	0.224	0.328	0.394	0.431	0.158	0.492	ND
1234678-HpCDD	C	3.13	2.1	3000	-	0.01	1.97	8.73	5.02	5.69	10.50	3.27	4.85	8.75	2.38
OCDD	C	36.5	21	30000	-	0.001	6.21	103	11.0	31.7	72.7	7.2	37.8	46.9	23.5
2378-TCDF	C	1.07	0.21	300	-	0.1	ND	0.448	0.547	0.486	2.70	0.230	0.395	0.772	0.761
12378-PeCDF	C	0.116	0.42	600	-	0.05	0.118	ND	0.195	0.153	0.285	0.395	0.230	0.278	0.121
23478-PeCDF	C	0.307	0.042	60	-	0.5	0.214	0.570	0.370	0.179	0.336	0.818	0.337	1.37	0.44
123478HxCDF	C	0.324	0.21	300	-	0.1	0.167	0.312	0.308	0.216	0.218	0.972	0.249	0.556	0.713
123678-HxCDF	C	0.271	0.21	300	-	0.1	0.173	0.297	0.170	ND	0.169	0.752	0.163	0.342	0.179
234678-HxCDF	C	0.408	0.21	300	-	0.1	ND	0.370	0.155	ND	0.238	1.090	0.150	0.390	0.139
123789-HxCDF	C	ND	0.21	300	-	0.1	ND	ND	ND	ND	ND	ND	ND	0.177	ND
1234678-HpCDF	C	1.42	2.1	3000	-	0.01	0.353	3.30	1.76	1.57	1.84	4.66	1.38	1.80	1.13
1234789-HpCDF	C	ND	2.1	3000	-	0.01	ND	ND	ND	ND	ND	0.240	ND	0.236	ND
OCDF	C	1.93	21	30000	-	0.001	ND	4.94	ND	1.64	2.66	1.94	1.75	2.75	1.71
Total TCDDs	C	0.593			-		ND	ND	ND	0.227	0.394	0.216	0.265	0.629	0.339
Total PeCDDs	C	0.81			-		0.286	ND	0.356	0.175	0.381	2.63	0.539	1.01	0.304
Total HxCDDs	C	1.2			-		0.594	2.04	1.73	1.31	2.39		1.50	3.39	0.28
Total HpCDDs	C	10.6			-		1.97	24.1	5.02	11.7	33.4	6.84	17.7	18.8	10.4
Total TCDFs	C	1.07			-		ND	0.448	0.547	0.486	2.70	2.19	0.395	0.772	1.84
Total PeCDFs	C	0.67			-		0.331	1.46	0.611	0.153	1.29	6.98	0.539	2.02	2.32
Total HxCDFs	C	2.45			-		1.15	4.03	3.86	0.679	1.85	7.96	2.20	4.00	2.60
Total HpCDFs	C	2.24			-		0.353	6.15	1.76	2.46	1.84	5.76	2.79	3.64	2.18
Dilution Factor					-		1	1	1	1	1	1	1	1	1
2378-TCDD TEQ (ND=0)				30			0.38	0.73	0.70	0.72	1.51	1.33	1.04	2.55	0.93
2378-TCDD TEQ (ND=1/2)				30			0.56	1.03	0.88	0.75	1.52	1.34	1.05	2.55	0.95
Fish Specie							Sunfish	Mullet	Bowfin	Shad	Shad	Largemouth	Sunfish	Mullet	Mullet
Location							Up Greenfield C.								Greenfield Creek

NOTES:

All results are in parts per trillion (ppt) by U.S. EPA Method 1613.

USEPA Region 3 Risk Based Concentrations (RBC).

TEF; TEQ = Toxicity equivalence factor; Toxicity equivalence quotient.

Italic results are Estimated Possible Maximum Concentrations (EMPC).

EMPC detection meets all QA/QC requirements except ion concen

Interferences may mask the result or constituent may or may not be present.

Exceeds Highest RBC.

SW = Surface Water

- = Not Analyzed

ND = Not Detected

NA = Not Applicable

BKGD = Background

C = Carcinogen

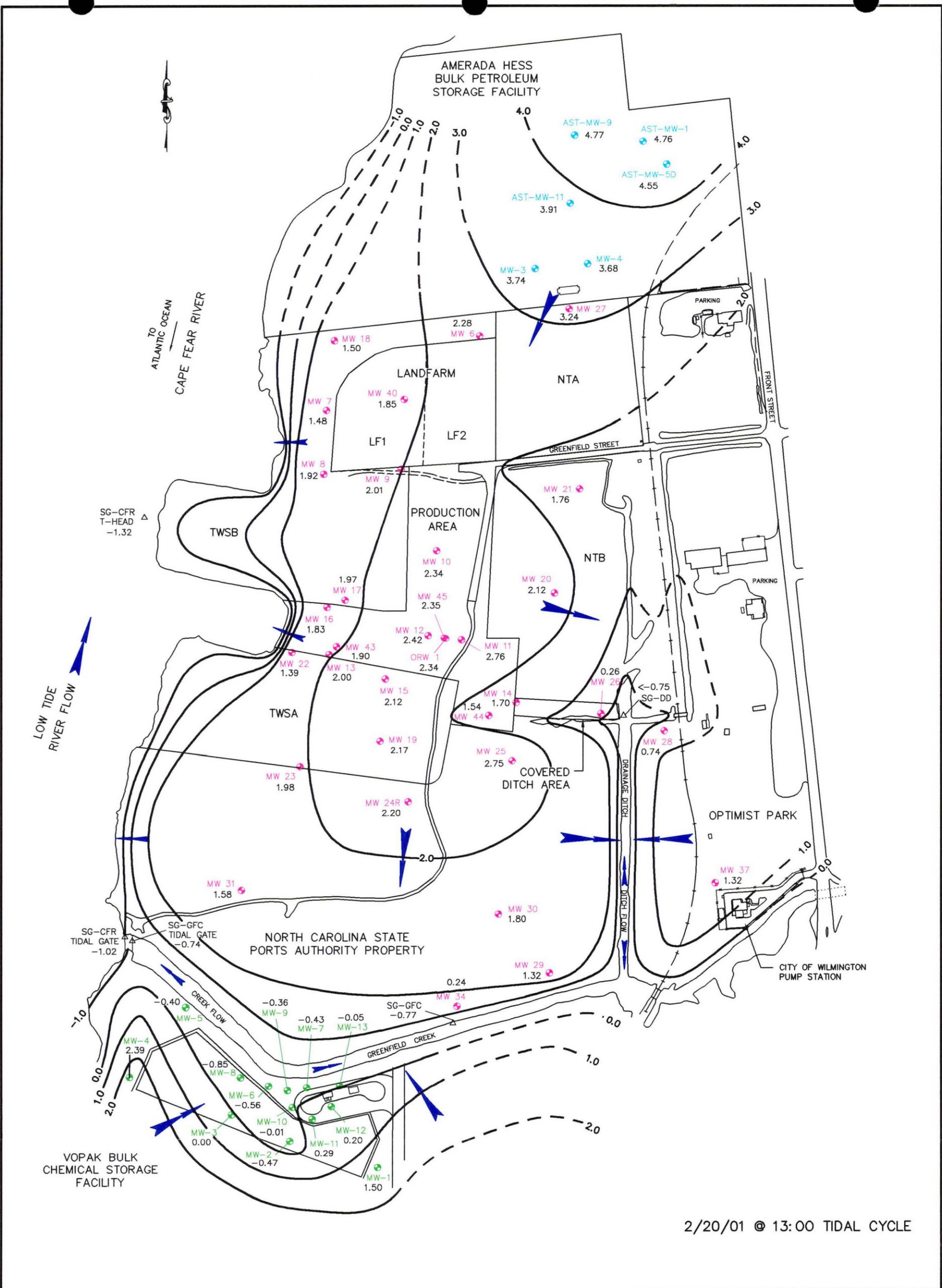
N = Non-carcinogen

Res = Residential

Ind = Industrial

S-Spec. = Site Specific

* Background Sample



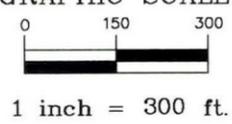
2/20/01 @ 13:00 TIDAL CYCLE

LEGEND

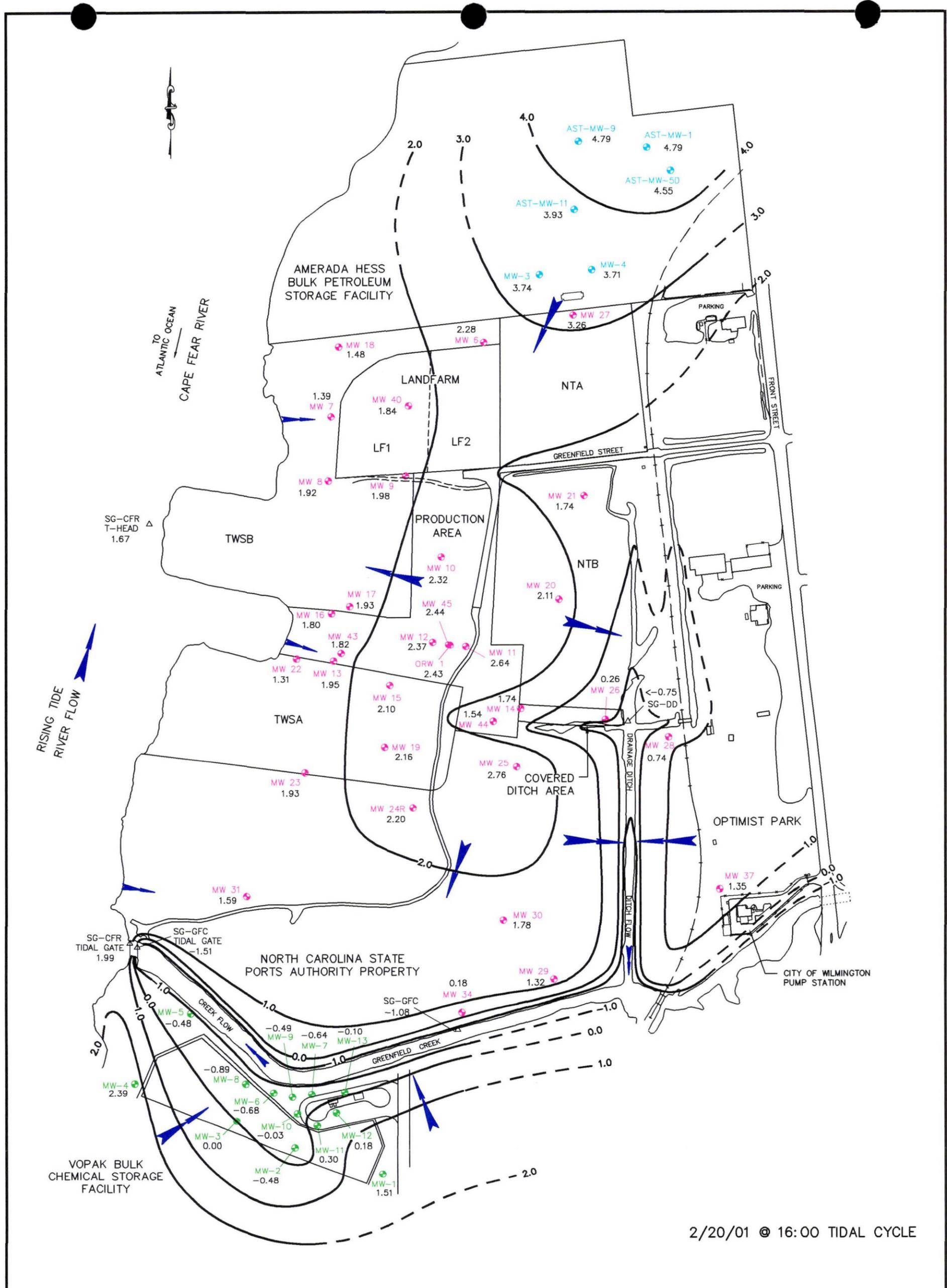
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- AMERADA HESS GROUNDWATER MONITORING WELLS (6)
- VOPAK FACILITY GROUNDWATER MONITORING WELLS (13)
- △ STAFF GAUGES (5)
- POTENTIOMETRIC LINES
- GROUNDWATER FLOW DIRECTION
- 3.74 GROUNDWATER ELEVATION

- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

GRAPHIC SCALE



SHALLOW AQUIFER POTENTIOMETRIC SURFACE SOUTHERN WOOD PIEDMONT COMPANY WILMINGTON, NEW HANOVER CO., N.C. FACILITY			
		104 Corporate Blvd., Suite 420 West Columbia, SC 29169 Phone: 803-796-6240 Fax: 803-796-6250	
REVISIONS			
DRAWN BY	CHECKED BY	SCALE	CADD NO.
CAB	GBK	1"=300'	shallowwellpm
DESIGN BY	DATE	PROJECT NO.	FIGURE NO.
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			SHEET NO.

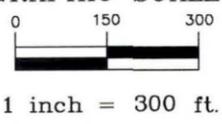


2/20/01 @ 16:00 TIDAL CYCLE

LEGEND

- GROUNDWATER MONITORING WELLS (33)
 - AMERADA HESS GROUNDWATER MONITORING WELLS (6)
 - VOPAK FACILITY GROUNDWATER MONITORING WELLS (13)
 - △ STAFF GAUGES (5)
 - POTENTIOMETRIC LINES
 - GROUNDWATER FLOW DIRECTION
 - 3.74 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
 - NTB } NON-TREATED WOOD STORAGE A & B
 - TWSA } TREATED WOOD STORAGE A & B
 - TWSB } TREATED WOOD STORAGE A & B
 - LF1 } LANDFARM AREA 1 & 2
 - LF2 } LANDFARM AREA 1 & 2

GRAPHIC SCALE

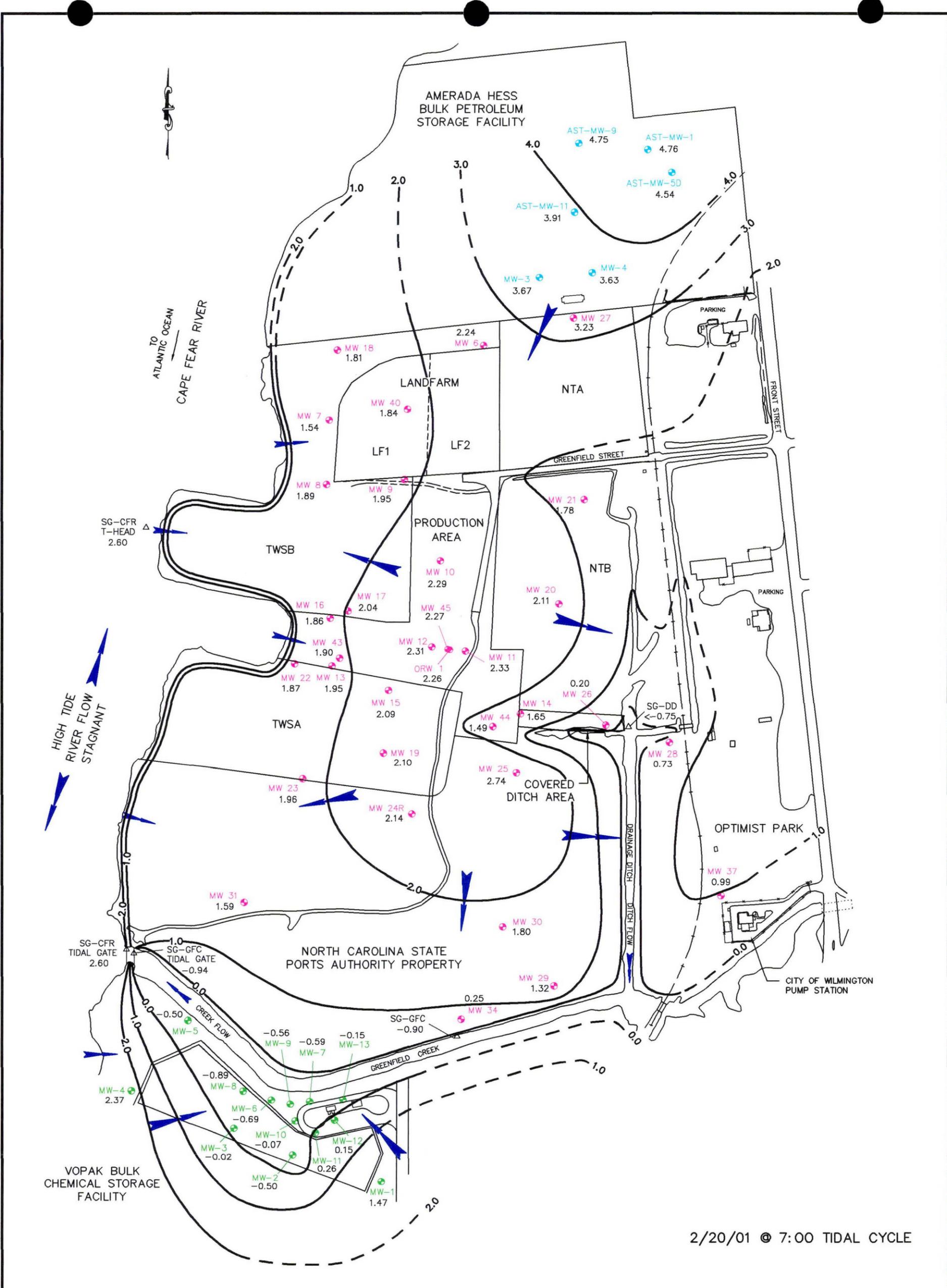


SHALLOW AQUIFER
 POTENTIOMETRIC SURFACE
 SOUTHERN WOOD PIEDMONT COMPANY
 WILMINGTON, NEW HANOVER CO., N.C. FACILITY

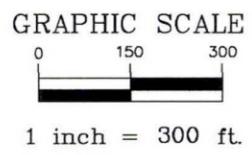


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REVISIONS			CADD NO.
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DESIGN BY	DATE	PROJECT NO.	2
GBK	10/01/01	979007.A0.26	SHEET NO.



2/20/01 @ 7:00 TIDAL CYCLE



LEGEND

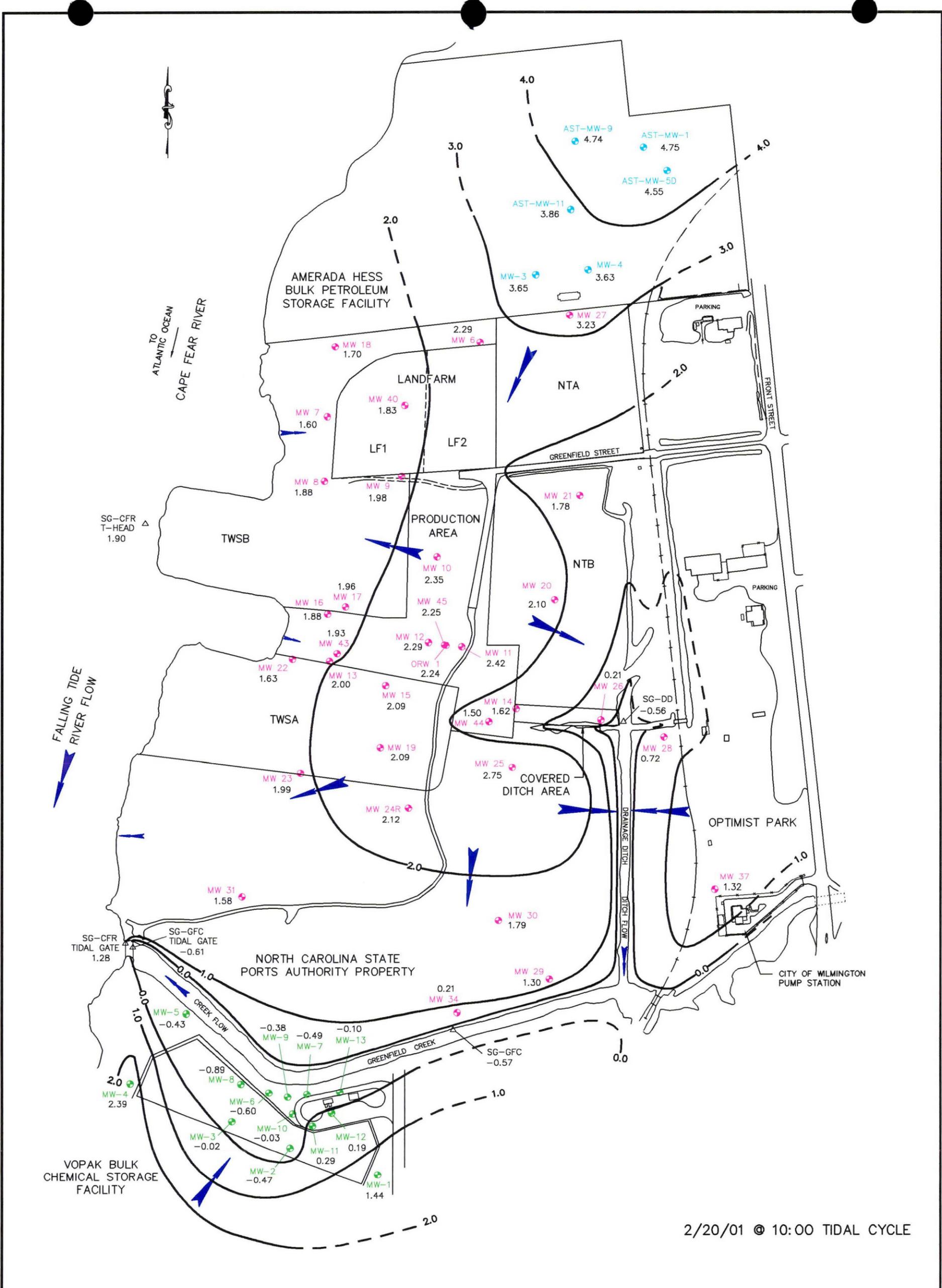
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- ⊕ AMERADA HESS GROUNDWATER MONITORING WELLS (6)
- ⊕ VOPAK FACILITY GROUNDWATER MONITORING WELLS (13)
- △ STAFF GAUGES (5)
- POTENTIOMETRIC LINES
- GROUNDWATER FLOW DIRECTION
- 3.74 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

**SHALLOW AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**

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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	shallowwells
DESIGN BY	DATE	PROJECT NO.	FIGURE NO.
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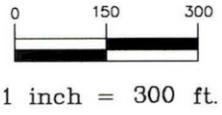


2/20/01 @ 10:00 TIDAL CYCLE

LEGEND

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- AMERADA HESS GROUNDWATER MONITORING WELLS (6)
- VOPAK FACILITY GROUNDWATER MONITORING WELLS (13)
- △ STAFF GAUGES (5)
- POTENTIOMETRIC LINES
- GROUNDWATER FLOW DIRECTION
- 3.74 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

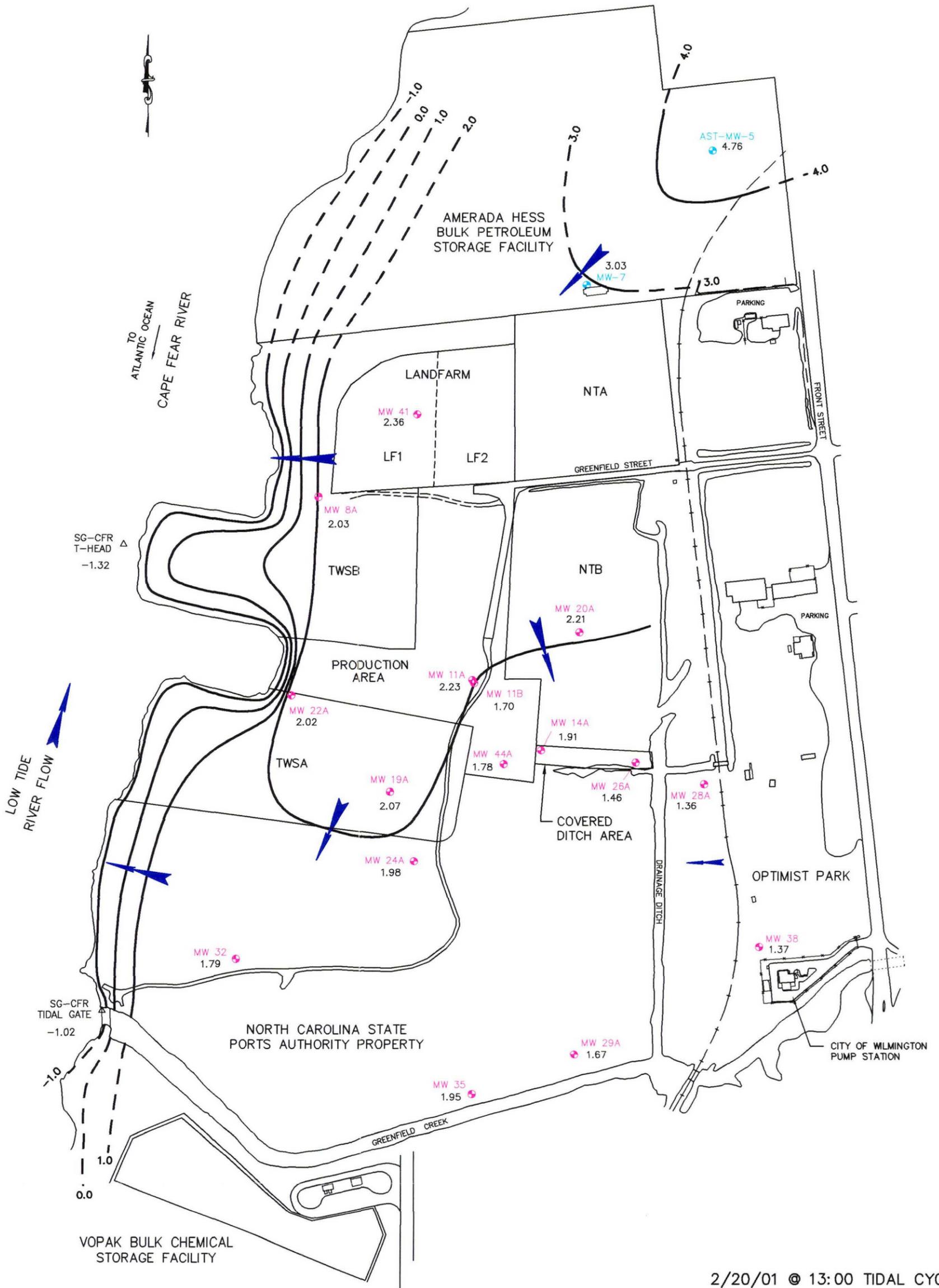
GRAPHIC SCALE



**SHALLOW AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**

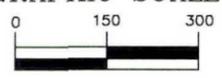
Schnabel Schnabel Engineering Associates, Inc.
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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	shallowwells
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DESIGN BY	DATE	PROJECT NO.	SHEET NO.
GBK	10/01/01	979007.A0.26	



2/20/01 @ 13:00 TIDAL CYCLE

GRAPHIC SCALE



1 inch = 300 ft.

LEGEND

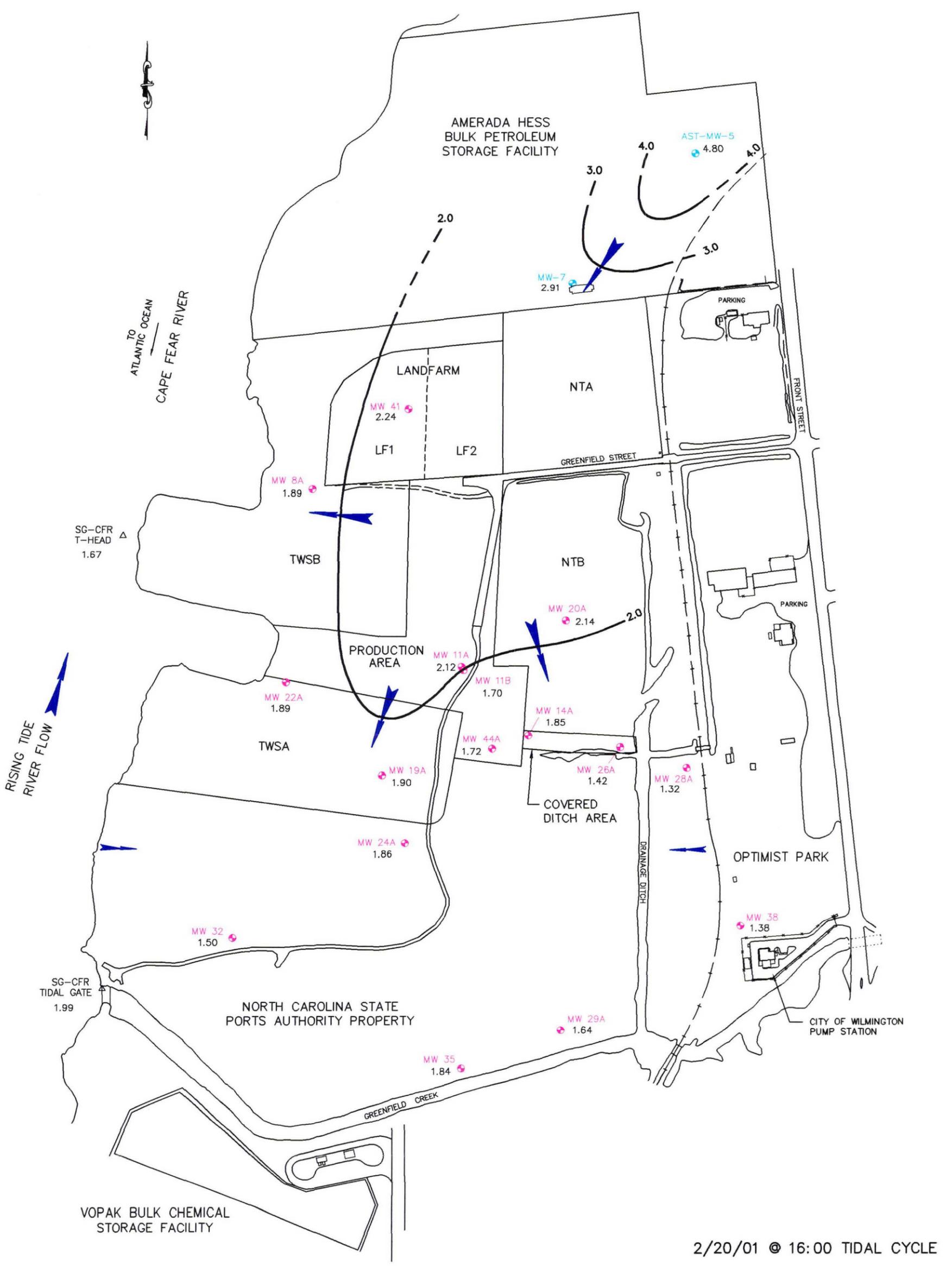
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- ⊕ AMERADA HESS GROUNDWATER MONITORING WELLS (2)
- △ STAFF GAUGES (2)
- POTENTIOMETRIC LINES
- ➡ GROUNDWATER FLOW DIRECTION
- 1.85 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

INTERMEDIATE AQUIFER
 POTENTIOMETRIC SURFACE
 SOUTHERN WOOD PIEDMONT COMPANY
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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	interwellsPM
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			5
DESIGN BY	DATE	PROJECT NO.	SHEET NO.
GBK	10/01/01	979007.A0.26	

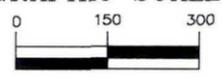


2/20/01 @ 16:00 TIDAL CYCLE

LEGEND

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- AMERADA HESS GROUNDWATER MONITORING WELLS (2)
- △ STAFF GAUGES (2)
- POTENTIOMETRIC LINES
- ➔ GROUNDWATER FLOW DIRECTION
- 1.85 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

GRAPHIC SCALE



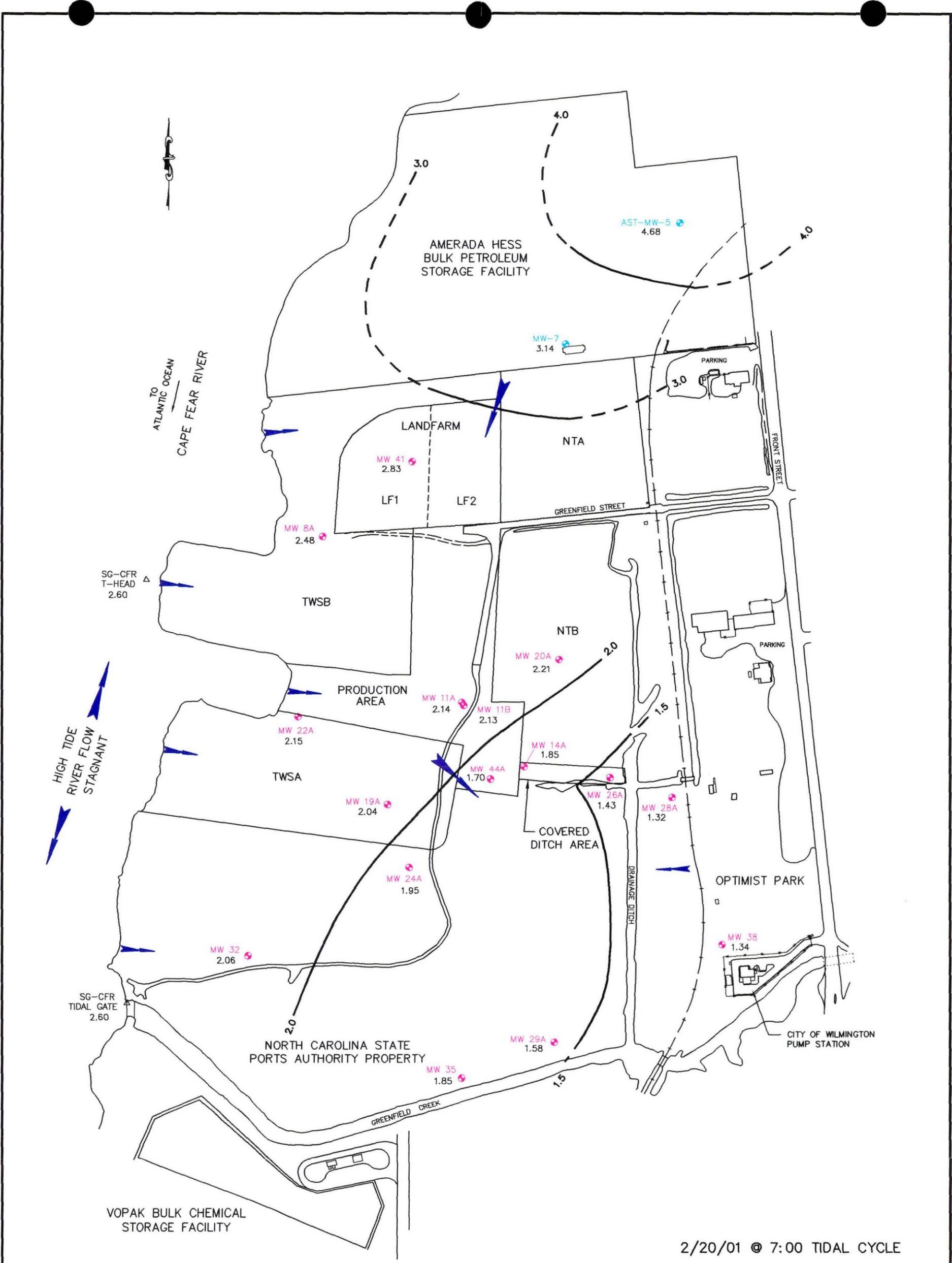
1 inch = 300 ft.

**INTERMEDIATE AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**

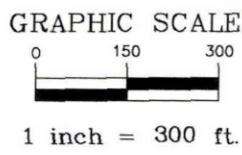


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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	interwellsPM
DESIGN BY	DATE	PROJECT NO.	FIGURE NO.
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2/20/01 @ 7:00 TIDAL CYCLE



LEGEND

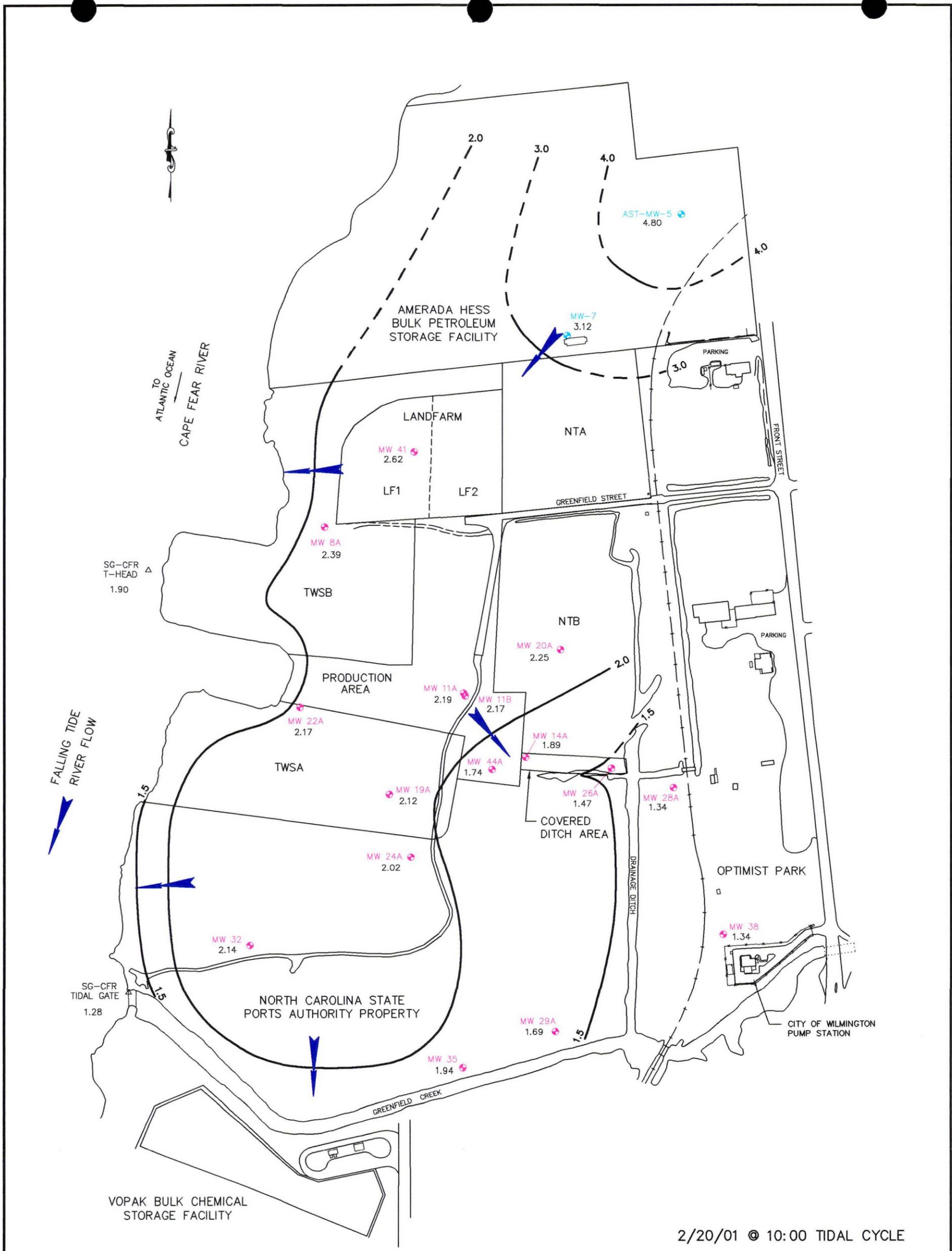
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- △ STAFF GAUGES (2)
- POTENTIOMETRIC LINES
- GROUNDWATER FLOW DIRECTION
- 1.85 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

INTERMEDIATE AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY

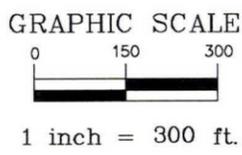
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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	interwells
GBK	GBK	1"=300'	FIGURE NO. 7
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2/20/01 @ 10:00 TIDAL CYCLE



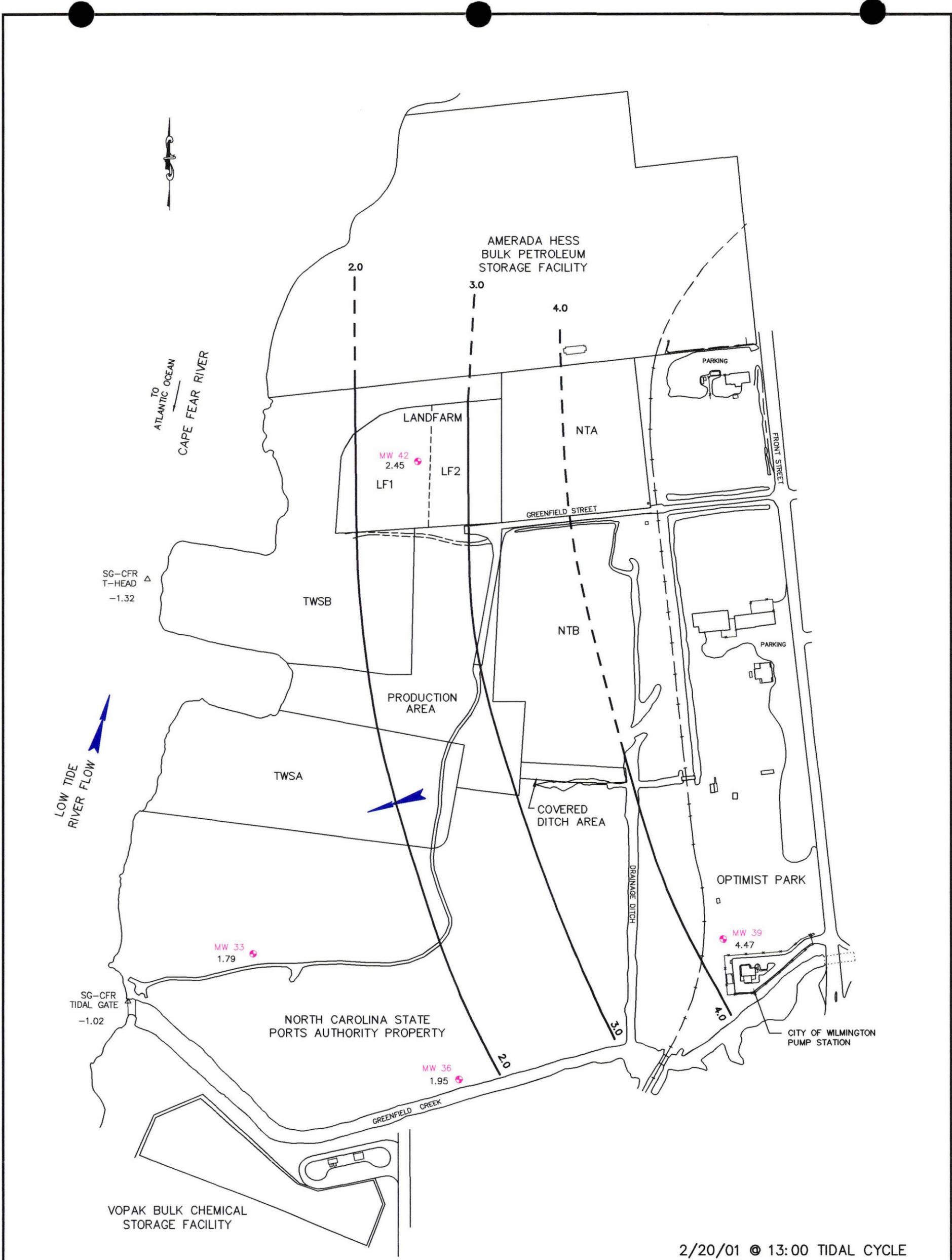
LEGEND

- GROUNDWATER MONITORING WELLS (15)
- AMERADA HESS GROUNDWATER MONITORING WELLS (2)
- △ STAFF GAUGES (2)
- POTENTIOMETRIC LINES
- ➔ GROUNDWATER FLOW DIRECTION
- 1.85 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

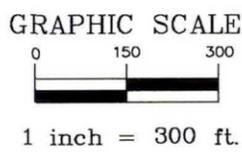
**INTERMEDIATE AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**

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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	interwells
DESIGN BY	DATE	PROJECT NO.	FIGURE NO.
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			SHEET NO.



2/20/01 @ 13:00 TIDAL CYCLE



LEGEND

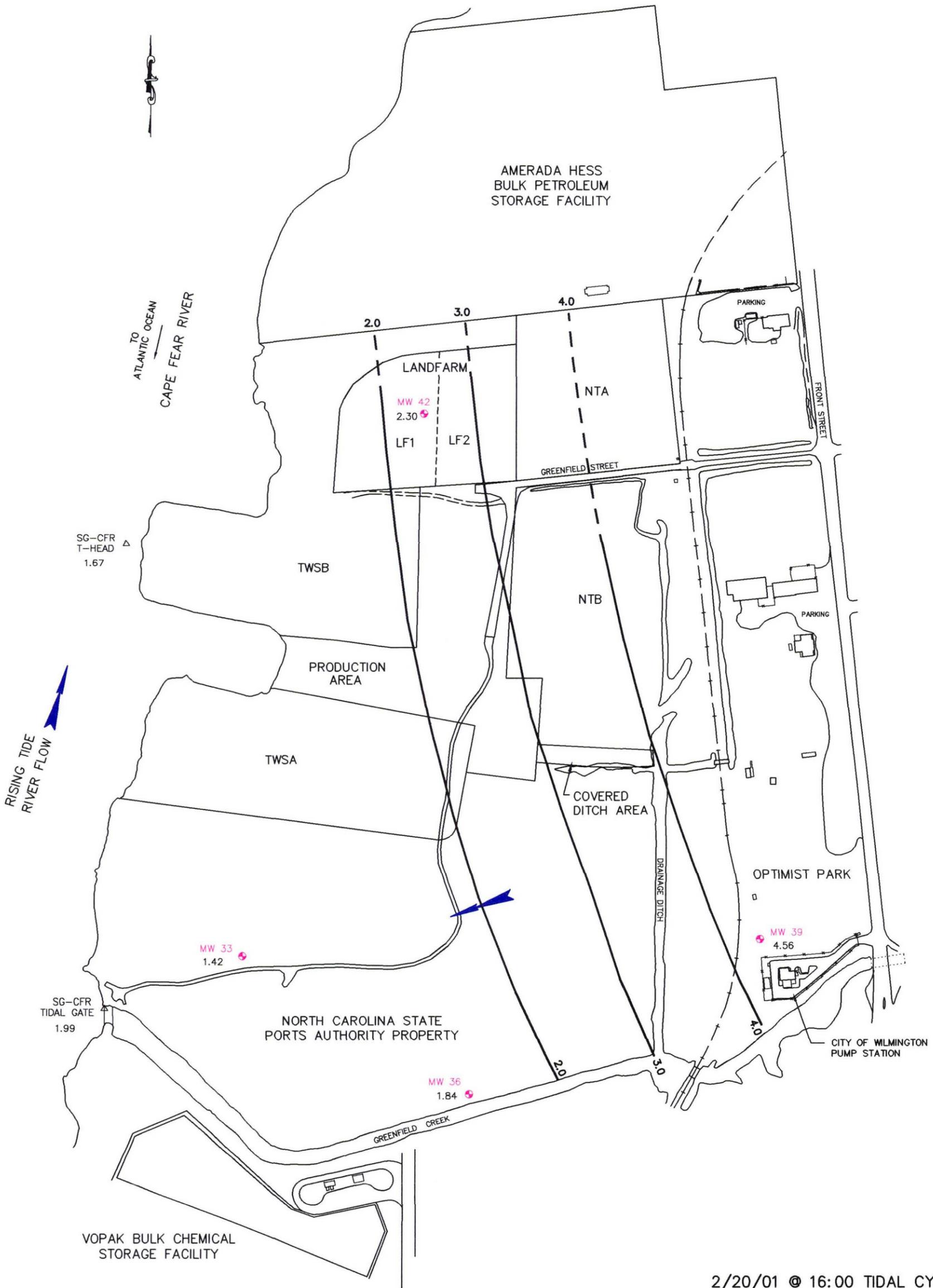
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- POTENTIOMETRIC LINES
- ➡ GROUNDWATER FLOW DIRECTION
- 1.95 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

**DEEP AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**



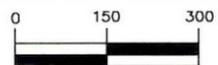
104 Corporate Blvd., Suite 420
West Columbia, SC 29169
Phone: 803-796-6240
Fax: 803-796-6250

REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	deepwellsPM
DESIGN BY	DATE	PROJECT NO.	FIGURE NO.
GBK	10/01/01	979007.A0.26	9
			SHEET NO.



2/20/01 @ 16:00 TIDAL CYCLE

GRAPHIC SCALE



1 inch = 300 ft.

LEGEND

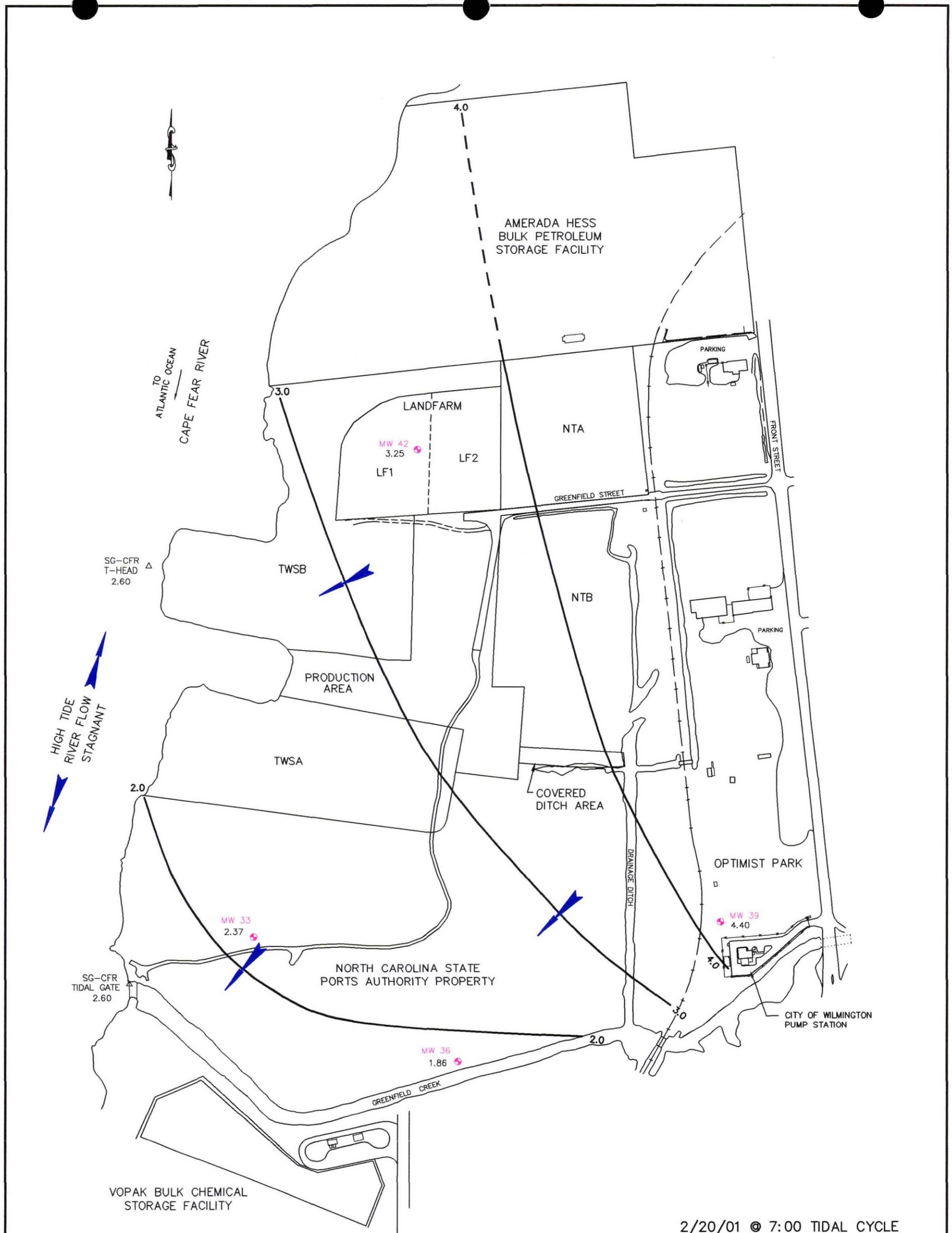
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- POTENTIOMETRIC LINES
- ➔ GROUNDWATER FLOW DIRECTION
- 1.84 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 LANDFARM AREA 1 & 2
- LF2

DEEP AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY

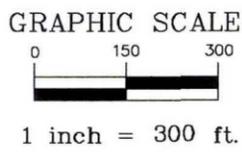
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Fax: 803-796-6250

REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	deepwellsPM
GBK	GBK	1" = 300'	FIGURE NO. 10
DESIGN BY	DATE	PROJECT NO.	SHEET NO.
GBK	10/01/01	979007.A0.26	



2/20/01 @ 7:00 TIDAL CYCLE



LEGEND

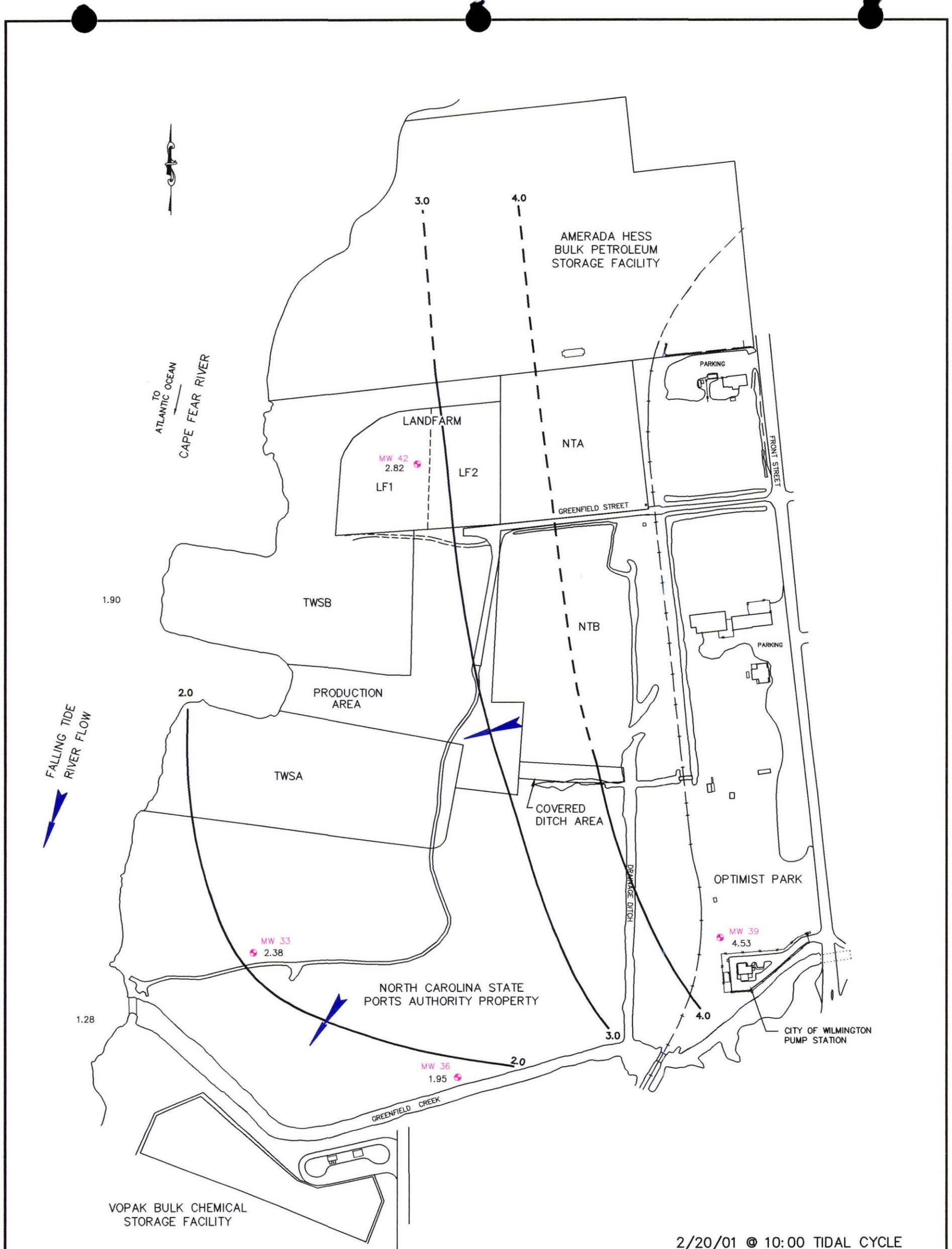
- ⊕ GROUNDWATER MONITORING WELLS (4)
- POTENTIOMETRIC LINES
- ➡ GROUNDWATER FLOW DIRECTION
- 1.86 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 LANDFARM AREA 1 & 2
- LF2

**DEEP AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**

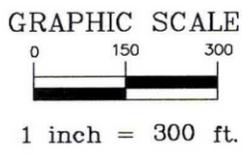
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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	FIGURE NO.
GBK	GBK	1"=300'	11
DESIGN BY	DATE	PROJECT NO.	SHEET NO.
GBK	10/01/01	979007.A0.26	



2/20/01 @ 10:00 TIDAL CYCLE



LEGEND

- ⊕ GROUNDWATER MONITORING WELLS (4)
- POTENTIOMETRIC LINES
- ➡ GROUNDWATER FLOW DIRECTION
- 1.95 GROUNDWATER ELEVATION
- NTA } NON-TREATED WOOD STORAGE A & B
- NTB }
- TWSA } TREATED WOOD STORAGE A & B
- TWSB }
- LF1 } LANDFARM AREA 1 & 2
- LF2 }

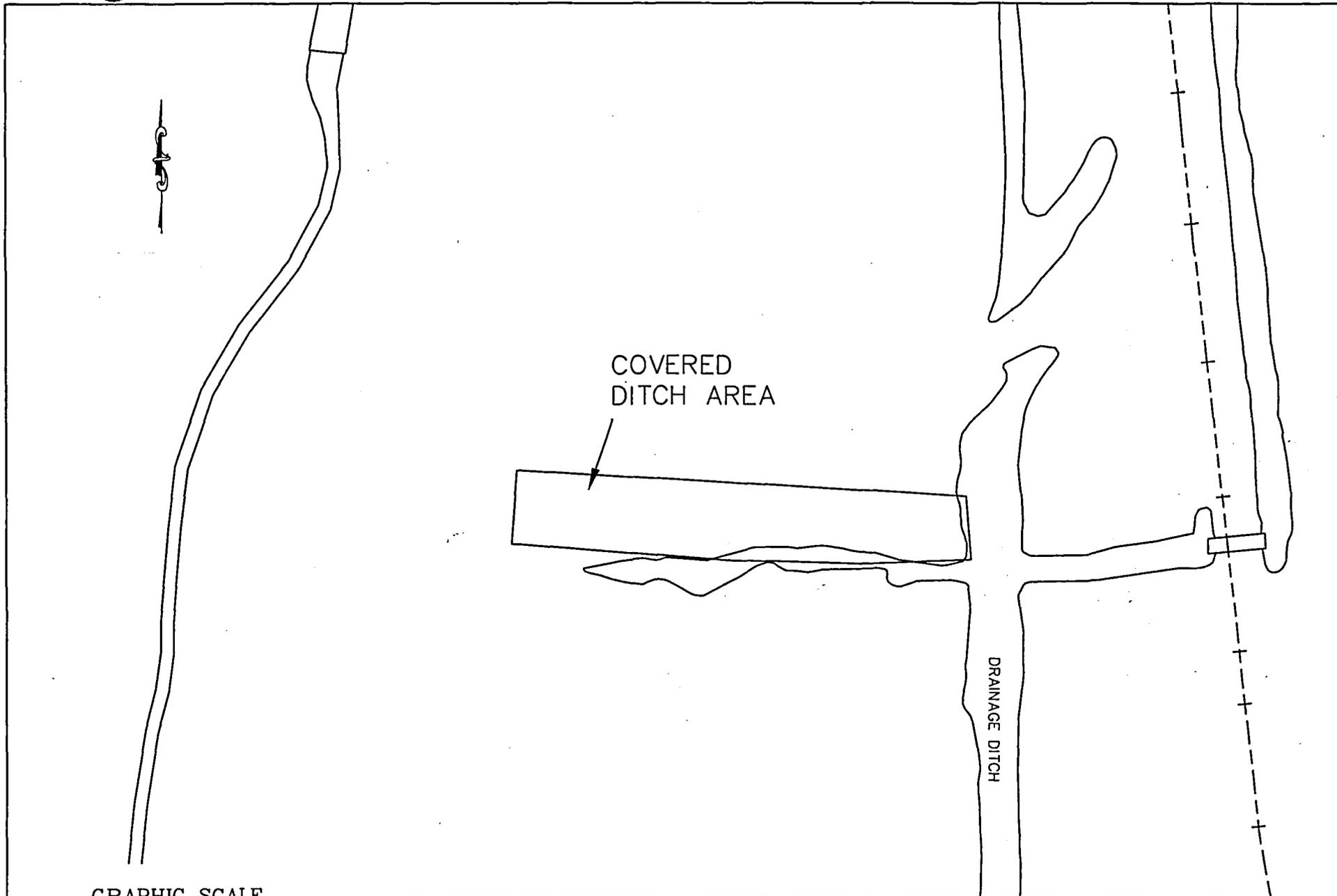
**DEEP AQUIFER
POTENTIOMETRIC SURFACE
SOUTHERN WOOD PIEDMONT COMPANY
WILMINGTON, NEW HANOVER CO., N.C. FACILITY**



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REVISIONS			CADD NO.
DRAWN BY	CHECKED BY	SCALE	FIGURE NO.
GBK	GBK	1"=300'	12
DESIGN BY	DATE	PROJECT NO.	SHEET NO.
GBK	10/01/01	979007.A0.26	

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GRAPHIC SCALE



1 inch = 100 ft.

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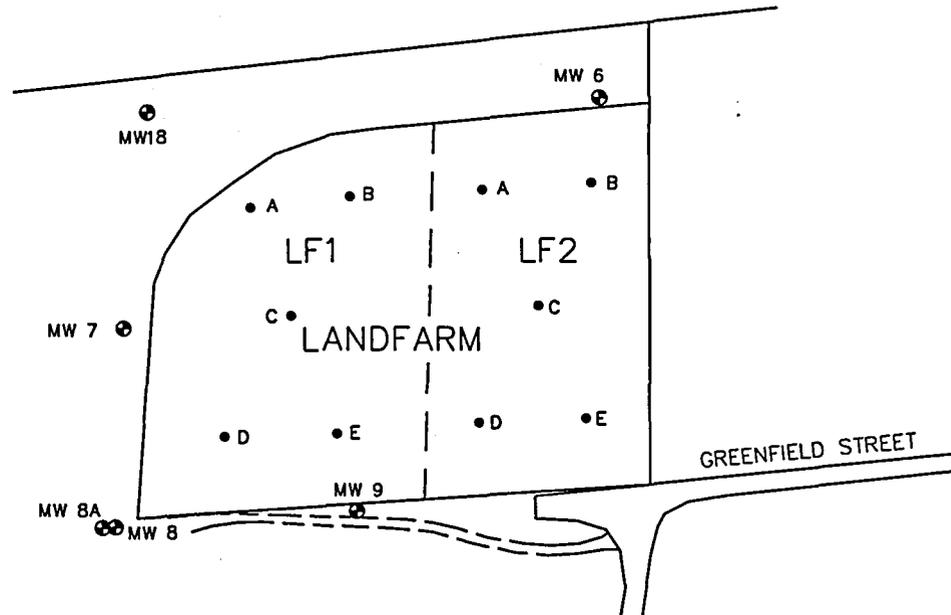
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SEA PROJECT NO. 979007.A0-26

COVERED DITCH
LOCATION MAP

FIGURE 13

10/01/01 c:\drawing\SWP\Wf\constituents map\landform10-01x1.dwg

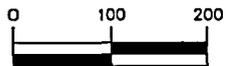


LEGEND

- ⊙ PERMANENT MONITORING WELLS
- LANDFARM COMPOSITE SOIL SAMPLES
- LF1 LANDFARM AREA 1

NOTE: SOIL SAMPLES WERE TAKEN BY COMPOSITING SAMPLES FROM A,B,C,D & E FROM EACH LANDFARM AREA (LF1 & LF2)

GRAPHIC SCALE



1 inch = 200 ft.



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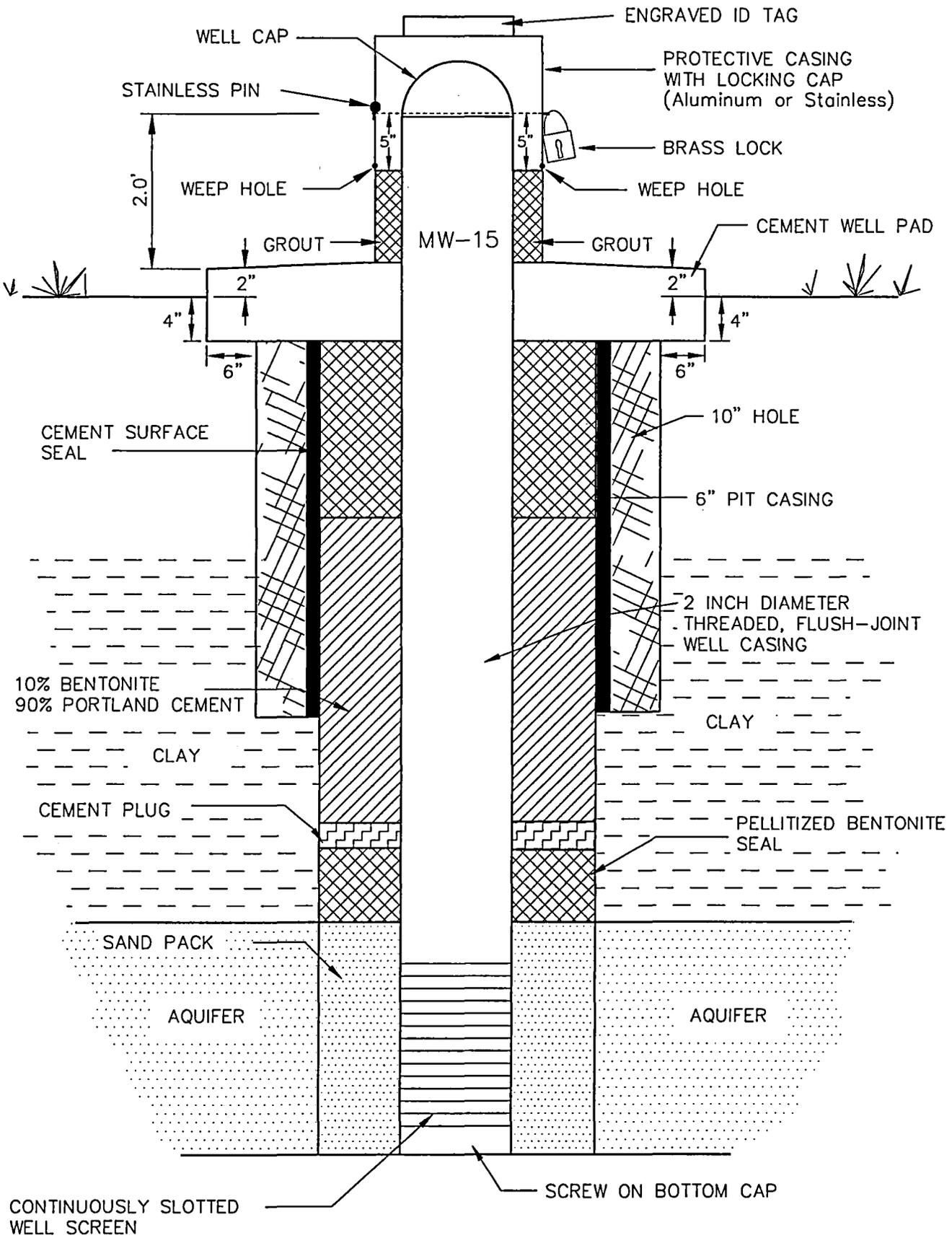
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LANDFARM SOIL
SAMPLE MAP

FIGURE 14

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10/01/01



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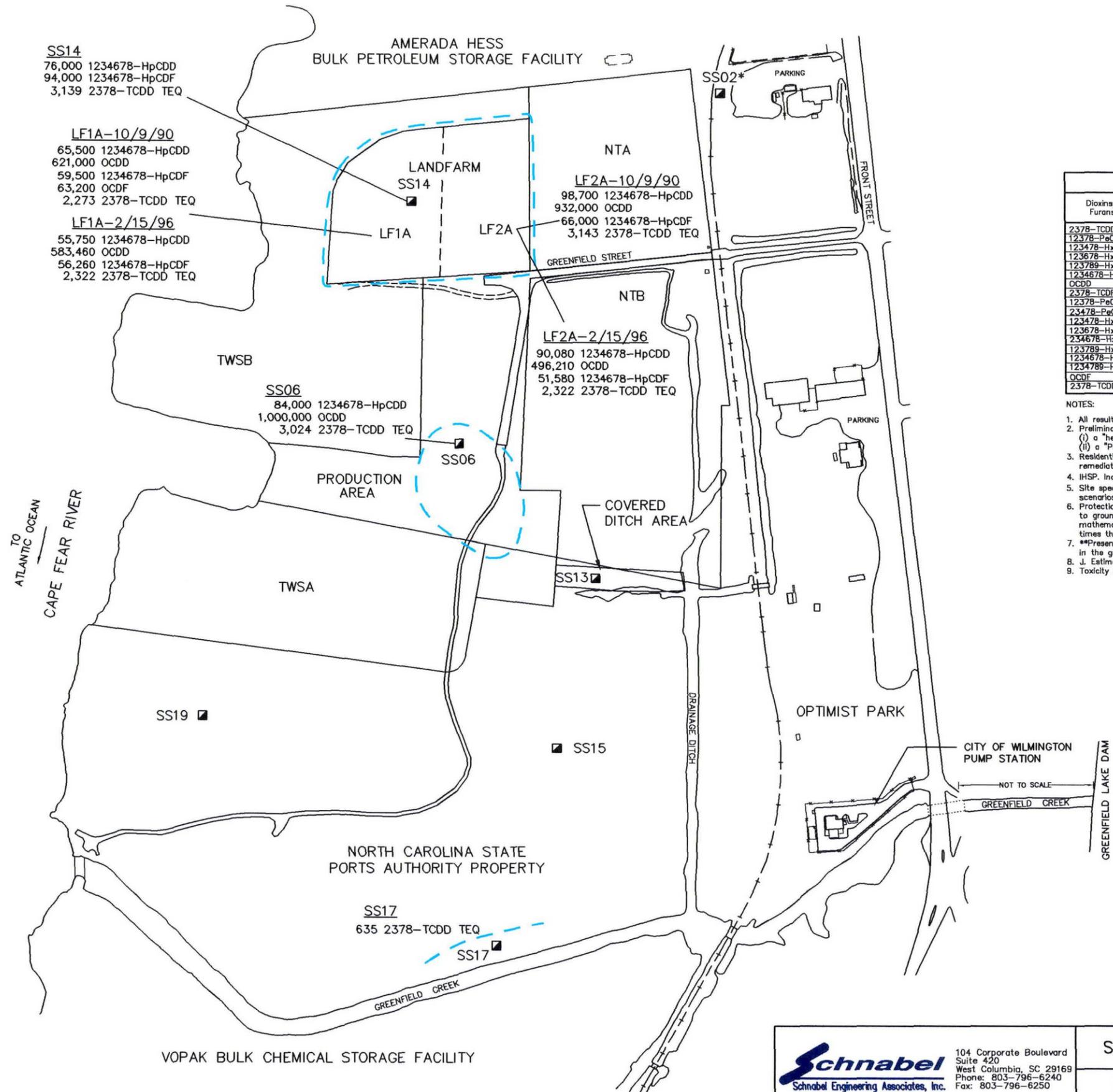
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SEA PROJECT NO. 979007.A0-26

WELL CONSTRUCTION
SPECIFICATION

FIGURE 15

10/01/01 G:\Drawing\SWP\WII\constituentmaps\surfsol-dioxin-01x1.dwg

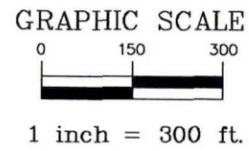


NOTE: ONLY CONSTITUENTS THAT EXCEED "HEALTH-BASED" PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals						
Dioxins/ Furans	Background PRG	Health Residential PRG	Health Industrial PRG	Site Specific Industrial PRG	Protection of Groundwater PRG	Present in Groundwater
2378-TCDD	ND	4	27	334	0.0044	No
12378-PeCDD	0.00076J	8	54	668	0.0088	No
123478-HxCDD	ND	40	270	3,340	0.044	No
123678-HxCDD	ND	40	270	3,340	0.044	No
123789-HxCDD	0.0013J	40	270	3,344	0.044	No
1234678-HpCDD	ND	400	2,700	33,440	0.44	Yes**
OCDD	ND	4,000	27,000	334,400	4.4	Yes**
2378-TCDF	ND	40	270	668	0.044	No
12378-PeCDF	-	80	540	6,680	0.088	No
23478-PeCDF	0.0032J	8	54	3,340	0.0088	No
123478-HxCDF	-	40	270	3,340	0.044	No
123678-HxCDF	0.0040J	40	270	3,344	0.044	No
234678-HxCDF	0.017	40	270	3,340	0.044	No
123789-HxCDF	-	40	270	33,440	0.044	No
1234678-HpCDF	0.042	400	2,700	33,440	0.44	Yes**
1234789-HpCDF	0.0010J	400	2,700	334,400	0.44	No
OCDF	0.028	4,000	27,000	334	4.4	No
2378-TCDD TEQ	-	4	27	334	0.0044	-

- NOTES:
- All results are in parts per trillion by USEPA Method 1613.
 - Preliminary Remediation Goals (PRG). Two soil remediation goals are recommended: (i) a "health-based" goal for total concentration of contaminants; and (ii) a "Protection-of-Groundwater" goal for residual contamination.
 - Residential health-based remediation goals are from Table 4-1 of IHSP. Industrial health-based remediation goals are from USEPA Region 9 PRG tables downloaded on August 20, 2001.
 - IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
 - Site specific health-based remediation goals are calculated goals based on actual future site use scenarios.
 - Protection-of-groundwater remediation goals should be based on leachability of residual contamination to groundwater. Because limited TCLP analysis has been completed and no scientifically-valid mathematical model using site-specific parameters has been completed, PRGs are based on 20 times the groundwater standard.
 - **Present in groundwater determination based on samples filtered by the laboratory. All detections in the groundwater from filtered samples are below the groundwater PRGs.
 - J. Estimated value.
 - Toxicity Equivalent Quotient (TEQ).

- LEGEND**
- DIOXIN & FURAN SAMPLE (7) USEPA, NOV. 6-DEC. 23, 1996
 - LF1A DIOXIN & FURAN COMPOSITE SAMPLE (2) VIROGROUP, INC. 1990 & 1996
 - 55.2 CONCENTRATION (ppt)
 - PRG DELINEATION LINE
 - * BACKGROUND LOCATION

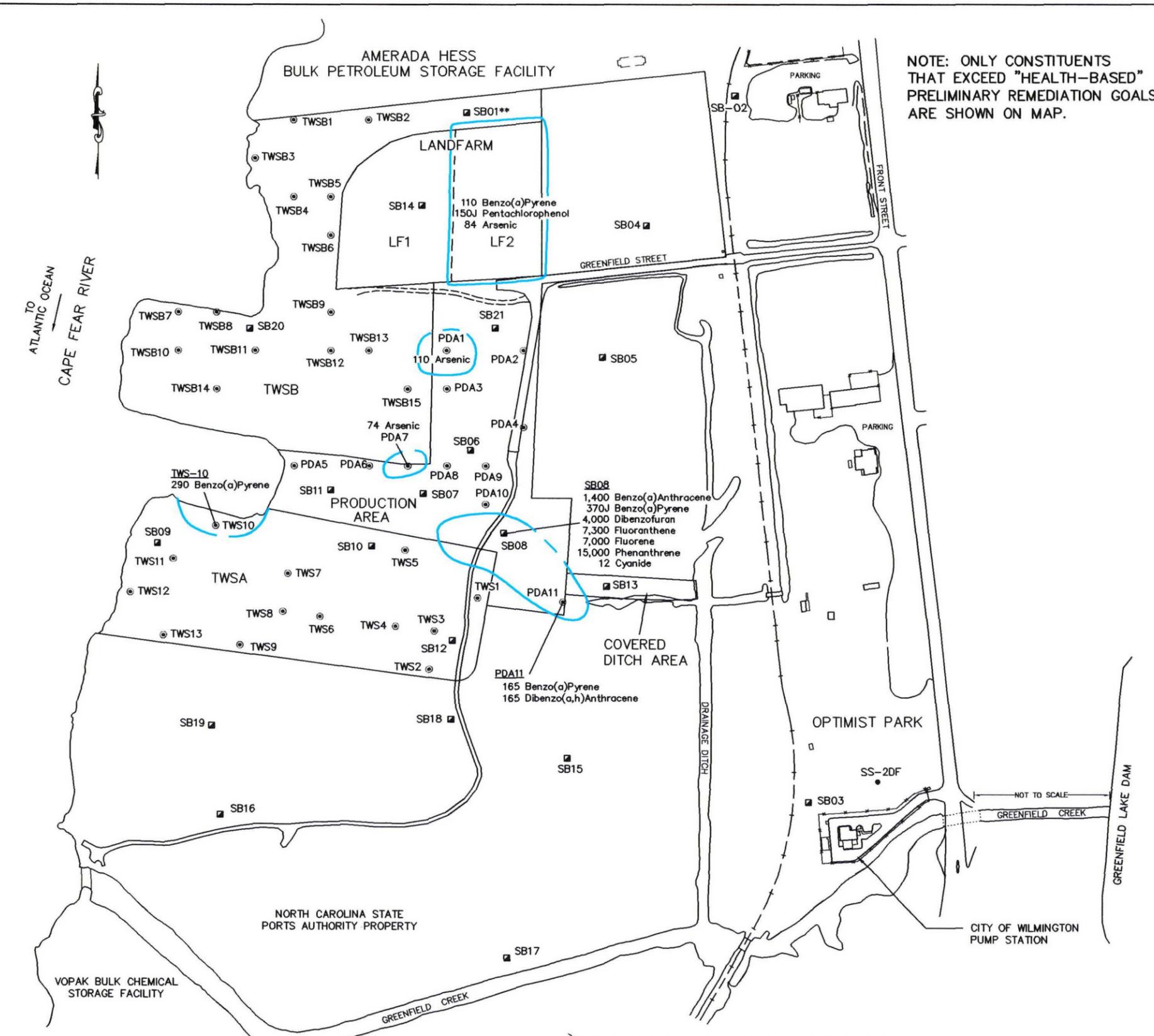


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SURFACE SOIL DIOXINS/
FURANS PRELIMINARY
REMEDIAL GOALS
FIGURE 17

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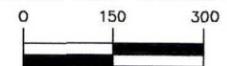
NOTE: ONLY CONSTITUENTS THAT EXCEED "HEALTH-BASED" PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals							
Group	Constituent	Background PRG	Health Residential PRG	Health Industrial PRG	Site Specific Industrial PRG	Protection Ground Water	Present in Ground Water
METALS	Aluminum	4,700	15,200	20,000		.36***	YES
	Arsenic	56J	0.39	2.7	61	0.050	YES
	Barium	43	1,080	20,000		2.0	YES
	Cadmium	ND	7.4	162		0.005	YES
	Calcium	4,800	-	-		-	YES
	Chromium	10.9	30	64	1,061	0.050	YES
	Cobalt	1.8J	940	20,000		2.2***	YES
	Copper	24	580	15,200		1.0	YES
	Cyanide	-	2.2	7		0.154	NO
	Iron	6,600	4,600	20,000		11***	YES
	Lead	100	400	400		0.015	YES
	Magnesium	640	-	-		-	YES
	Manganese	65	360	6,400		0.88***	YES
	Manganese	ND	4.6	122		0.0011	YES
	Mercury	ND	-	-		-	YES
	Nickel	3.3J	320	8,200		0.10	YES
	Potassium	300	-	-		-	YES
	Sodium	270	-	-		-	YES
	Vanadium	12	110	2,800		0.260***	YES
	Zinc	100	4,600	20,000		2.10	YES
	VOLATILES	Alkanes	-	0.35	0.77		-
Benzene		0.021J	320	1240		0.02	NO
Branched Alkane		-	-	-		-	-
Cyclic Alkanes		-	8.9	21		-	NO
Ethyl Benzene		-	300	300		0.58	NO
Methyl Ethyl Ketone (2-Butanone)		0.021J	1460	5600		3.4	NO
Total Xylenes		-	104	520		10.6	NO
SEMI-VOLATILES	1-Methylnaphthalene	-	0.062**	0.29**	110**	-	-
	2,4-Dimethylphenol	ND	2,400	-	-	2.8	YES
	2-Methylnaphthalene	ND	11.2	38		0.56	YES
	Acenaphthene	ND	740	7,600		1.6	YES
	Acenaphthylene	ND	460**	10,800**		-	NO
	Alkanes	ND	-	-		-	-
	Anthracene	ND	4,400	20,000		42	YES
	Benzo(a)Anthracene	ND	0.62	2.9	1,097	0.001	YES
	Benzo(a)Pyrene	ND	0.062	0.29	110	0.000094	YES
	Benzo(b)Fluoranthene	0.044J	0.62	2.9	1,097	0.00094	YES
	Benzo(b,k)Fluoranthene	0.260J	0.62	2.9	1,097	0.00094	YES
	Benzo(g,h,i)Perylene	ND	460**	10,800**		4.2	YES
	Benzo(k)Fluoranthene	-	6.2	29	10,989	0.0094	YES
	Biphenyl	-	350	350	31,679	-	NO
	Carbazole	ND	24	120	40,019	0.068***	YES
	Carboxylic Acids	-	-	-	-	-	-
	Chrysene	ND	62	290	109,894	0.01	YES
	Cresol (ortho)	ND	620	8,800		1.8***	YES
	Cresol m & p	ND	62	880		0.070	YES
	Dibenzo(a,h)Anthracene	-	0.062	0.29	110	0.000094	YES
	Dibenzofuran	ND	58	1,020		0.56	YES
	Fluoranthene	ND	460	6,000		5.6	YES
	Fluorene	ND	520	6,600		5.6	YES
	Indeno(1,2,3-Cd)Pyrene	ND	0.62	2.9	1,097	0.0094	YES
	Naphthalene	ND	11.2	38	12,378	0.42	YES
	Pentachlorophenol	-	3	11	59	0.006	YES
	Perylene	-	-	-	-	-	NO
	Phenanthrene	ND	460**	10,800**		4.2	YES
Phenol	ND	7,400	20,000		6.0	YES	
Pyrene	0.049J	460	10,800		4.2	YES	
Tetrachlorophenols	-	360	5,200		4.2	YES	
PESTICIDES & PCB'S	4,4-DDD (P,P'-DDD)	ND	2.4	17		0.0028	YES*
	4,4-DDE (P,P'-DDE)	ND	1.7	12		0.002	NO
	4,4-DDT (P,P'-DDT)	ND	1.7	12		0.004***	NO
	Alpha-Chlordane/2	ND	1.6	11		0.00054	NO
	Dieldrin	ND	0.03	0.15		0.000044	NO
Endosulfan I (Alpha)	ND	74	1060		4.4***	NO	

NOTES:

- All results are in mg/kg dw by USEPA Methods.
- Preliminary Remediation Goals (PRG). Two soil remediation goals are recommended: (i) a "health-based" goal for total concentration of contaminants; and (ii) a "Protection-of-Groundwater" goal for residual contamination.
- Residential health-based remediation goals are from Table 4-1 of IHSP. Industrial health-based remediation goals are from USEPA Region 9 PRG tables downloaded on August 20, 2001.
- IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
- Site-specific health-based remediation goals are calculated based on actual future site use scenarios.
- Protection-of-Groundwater remediation goals should be based on leachability of residual contamination to groundwater. Because limited TCLP analysis has been completed and no scientifically-valid mathematical model using site-specific parameters has been completed, PRGs are based on 20 times the groundwater standard.
- J. Estimated value.
- Only detected constituents are listed in the PRG table.
- *Detected at background concentrations.
- ** Not analyzed or no PRG determined.
- Landfarm samples collected prior to 1990 were not used in the evaluation of PRG exceedance. These samples are considered landfarm operation samples. The highest detected concentration that exceeds the PRG is shown in the landfarm area.
- Soil samples collected prior to 1985 were not used in the evaluation of PRG exceedance. These samples were either excavated and placed on the landfarm, tilled in place or stabilized with concrete and buried in place.
- **Carcinogenic PAH's are screened using the PRG for Benzo(a)Pyrene. Non-carcinogenic PAH's are screened using the remediation goal for Pyrene.
- ***Groundwater concentration is USEPA Region 9 Tap Water Concentration.
- Cyanide is not a wood-treatment plant related constituent and is not considered a PRG exceedance.
- PDA11 concentration for benzo(a)pyrene and dibenzo(a,h)anthracene are one-half of the practical quantitation limit.

GRAPHIC SCALE



1 inch = 300 ft.

LEGEND

0.15 CONCENTRATION (mg/l)
PRG DELINEATION LINE

SB04 } SOIL SAMPLE LOCATIONS: USEPA, NOV. 6-DEC. 23, 1996
SAMPLE > 2', BUT ABOVE WATER TABLE (21)

TWS5 } SOIL SAMPLE LOCATIONS: GERAGHTY & MILLER, INC. FEB. 1991
SAMPLE 12"-18" (13)

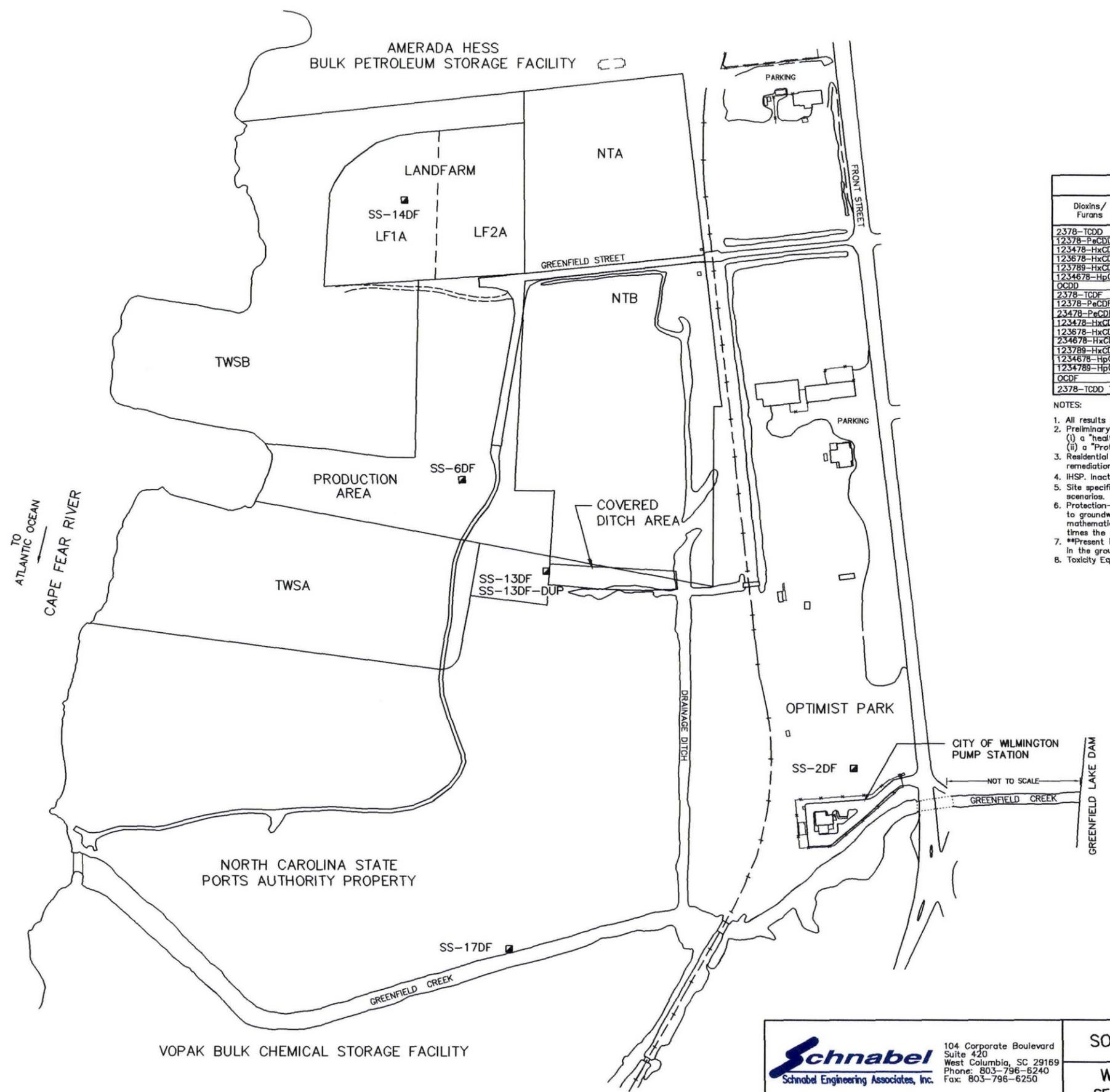
TWSB1 } SOIL SAMPLE LOCATIONS: VIROGROUP, INC. FEB. 1996
PDA1 } SAMPLE 12"-18" (26)

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SEA PROJECT NO. 979007.A0-26

SUBSURFACE SOIL
PRELIMINARY
REMEDIAL GOALS
FIGURE 18

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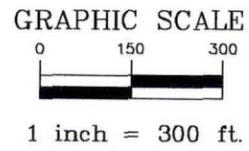
NOTE: ONLY CONSTITUENTS THAT EXCEED "HEALTH-BASED" PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals						
Dioxins/ Furans	Background PRG	Health Residential PRG	Health Industrial PRG	Site Specific Industrial PRG	Protection of Groundwater PRG	Present in Groundwater
2378-TCDD	1.91	4	27	1,200	0.0044	NO
12378-PeCDD	2.1	8	54	2,400	0.0088	NO
123478-HxCDD	3.33	40	270	12,000	0.044	NO
123678-HxCDD	7.63	40	270	12,000	0.044	NO
123789-HxCDD	6.48	40	270	12,000	0.044	NO
1234678-HpCDD	244	400	2,700	120,000	4.4	YES**
OCDD	8,840	4,000	27,000	1,200,000	4.4	YES**
2378-TCDF	6.09	40	270	12,000	0.044	NO
12378-PeCDF	3.54	80	540	24,000	0.088	NO
123478-HxCDF	23.7	8	54	2,400	0.0088	NO
123678-HxCDF	4.94	40	270	12,000	0.044	NO
123789-HxCDF	8.06	40	270	12,000	0.044	NO
234678-HxCDF	15.6	40	270	12,000	0.044	NO
123789-HxCDF	ND	40	270	12,000	0.044	NO
1234678-HpCDF	58.2	400	2,700	120,000	4.4	YES**
1234789-HpCDF	2.88	400	2,700	120,000	4.4	NO
OCDF	81.9	4,000	27,000	1,200,000	4.4	NO
2378-TCDD TEQ	-	4	27	1,200	0.0044	-

- NOTES:
- All results are in parts per trillion by USEPA Method 1613.
 - Preliminary Remediation Goals (PRG). Two soil remediation goals are recommended: (i) a "health-based" goal for total concentration of contaminants; and (ii) a "Protection-of-Groundwater" goal for residual contamination.
 - Residential health-based remediation goals are from Table 4-1 of IHSP. Industrial health-based remediation goals are from USEPA Region 9 PRG tables downloaded on August 20, 2001.
 - IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
 - Site specific health-based remediation goals are calculated goals based on actual future site use scenarios.
 - Protection-of-groundwater remediation goals should be based on leachability of residual contamination to groundwater. Because limited TCLP analysis has been completed and no scientifically-valid mathematical model using site-specific parameters has been completed, PRGs are based on 20 times the groundwater standard.
 - **Present in groundwater determination based on samples filtered by the laboratory. All detections in the groundwater from filtered samples are below the groundwater PRG.
 - Toxicity Equivalent Quotient (TEQ).

LEGEND

■ DIOXIN & FURAN SAMPLE (5)

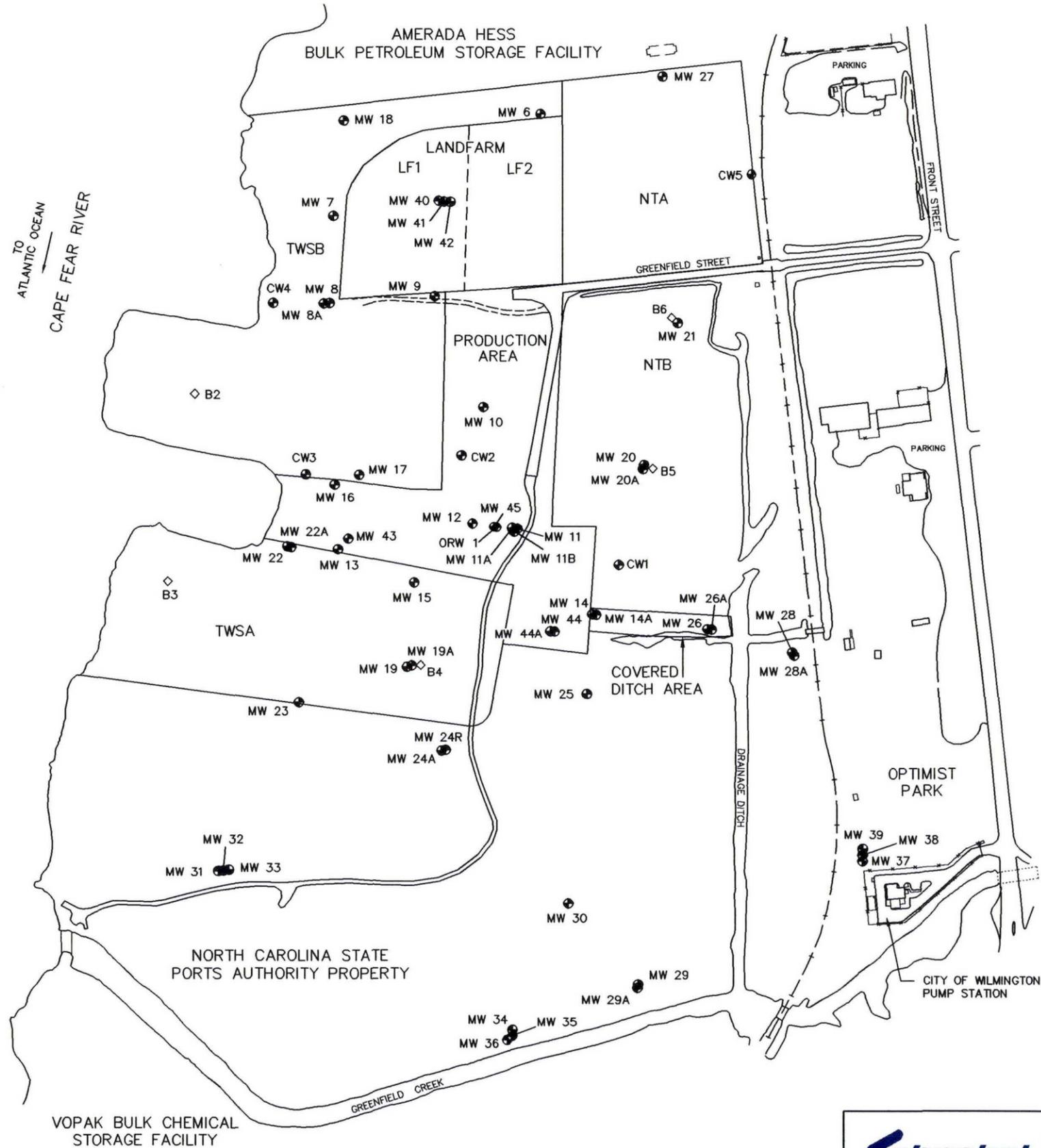


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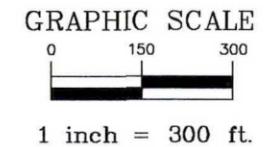
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SEA PROJECT NO. 979007.A0-26

SUBSURFACE SOIL DIOXINS/
FURANS PRELIMINARY
REMEDIAL GOALS
FIGURE 19

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- LEGEND**
- MONITORING WELLS (53)
 - ◇ ABANDONED TEMPORARY MONITORING WELLS (5)
 - AW-01 ARTESIAN WELL NEAR GREENFIELD PARK



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MONITORING WELL LOCATION MAP

AMERADA HESS
BULK PETROLEUM STORAGE FACILITY

TO
ATLANTIC OCEAN
CAPE FEAR RIVER

LANDFARM

NTA

MW 40
0.0221 1234678-HpCDD
0.00063 2378-TCDD TEQ

LF1 LF2

GREENFIELD STREET

PARKING

FRONT STREET

TWSB

MW-17-DISSOLVED
No PRG Exceedance

MW-17
0.0678 1234678-HpCDD
1.06 OCDD
0.0309 1234678-HpCDF
0.00210 2378-TCDD TEQ

PRODUCTION AREA

NTB

PARKING

COVERED
DITCH AREA

MW 14

MW-14
0.0383 1234678-HpCDD
0.0022 23478-PeCDF
0.0107 123478-HxCDF
0.004 123789-HxCDF
1.12 1234789-HpCDF
0.762 OCDF
0.01693 2378-TCDD TEQ

OPTIMIST PARK

CITY OF WILMINGTON
PUMP STATION

NORTH CAROLINA STATE
PORTS AUTHORITY PROPERTY

0.00071 2378-TCDD TEQ
MW 34

GREENFIELD CREEK

VOPAK BULK CHEMICAL STORAGE FACILITY

NOTE: ONLY CONSTITUENTS
THAT EXCEED PRELIMINARY
REMEDIATION GOALS ARE
SHOWN ON MAP.

Preliminary Remediation Goals

DIOXINS/FURANS	MDL	PRG
2378-TCDD	0.00237	0.00022
12378-PeCDD	0.00365	0.00044
123478-HxCDD	0.00690	0.0022
123678-HxCDD	0.00602	0.0022
123789-HxCDD	0.00340	0.0022
1234678-HpCDD	0.00465	0.022
OCDD	0.02406	0.22
2378-TCDF	0.00178	0.0022
12378-PeCDF	0.00225	0.0044
23478-PeCDF	0.00128	0.00044
123478-HxCDF	0.00475	0.0022
123678-HxCDF	0.00365	0.0022
234678-HxCDF	0.00492	0.0022
123789-HxCDF	0.00245	0.0022
1234678-HpCDF	0.00290	0.022
1234789-HpCDF	0.00394	0.022
OCDF	0.00609	0.22
2378-TCDD TEQ	-	0.00022

NOTES:

- All results are in parts per billion by USEPA Method 1613.
- Method Detection Limit (MDL).
- Preliminary Remediation Goal (PRG). The PRG is the least stringent of: (i) the health-based remediation goals shown in Table 4-2 (IHSP); (ii) the MDL; or (iii) natural background concentrations (metals only).
- IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
- MW-12 and MW-17 were analyzed for both total and dissolved Dioxins/Furans. Samples for dissolved Dioxins/Furans were filtered by the laboratory prior to analysis with a .45 micron filter. The filtered samples did not exceed groundwater PRGs.
- MW-14 and MW-40 were not filtered prior to analysis. Based on the results from MW-12 and MW-17 it is likely that dissolved analysis from these wells would indicate that all constituents are also below the PRG.
- Toxicity Equivalent Quotient (TEQ).

MW-12
0.0162 123678-HxCDD
0.921 1234678-HpCDD
9.88 OCDD
0.0013 23478-PeCDF
0.0903 1234678-HpCDF
0.674 OCDF
0.02389 2378-TCDD TEQ

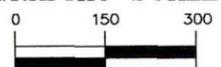
MW-12-DUP
0.0236 123678-HxCDD
0.0042 123789-HxCDD
1.48 1234678-HpCDD
16.0 OCDD
0.0021 23478-PeCDF
0.0058 123478-HxCDF
0.0028 123789-HxCDF
0.148 1234678-HpCDF
1.07 OCDF
0.03917 2378-TCDD TEQ

MW-12-DISSOLVED
No PRG Exceedance

LEGEND

- MONITORING WELLS (5)
- 16.0 CONCENTRATION (mg/l)
- DUP DUPLICATE SAMPLE
- DISSOLVED FILTERED SAMPLE
- GROUNDWATER SAMPLES COLLECTED
FEBRUARY 2001

GRAPHIC SCALE



1 inch = 300 ft.

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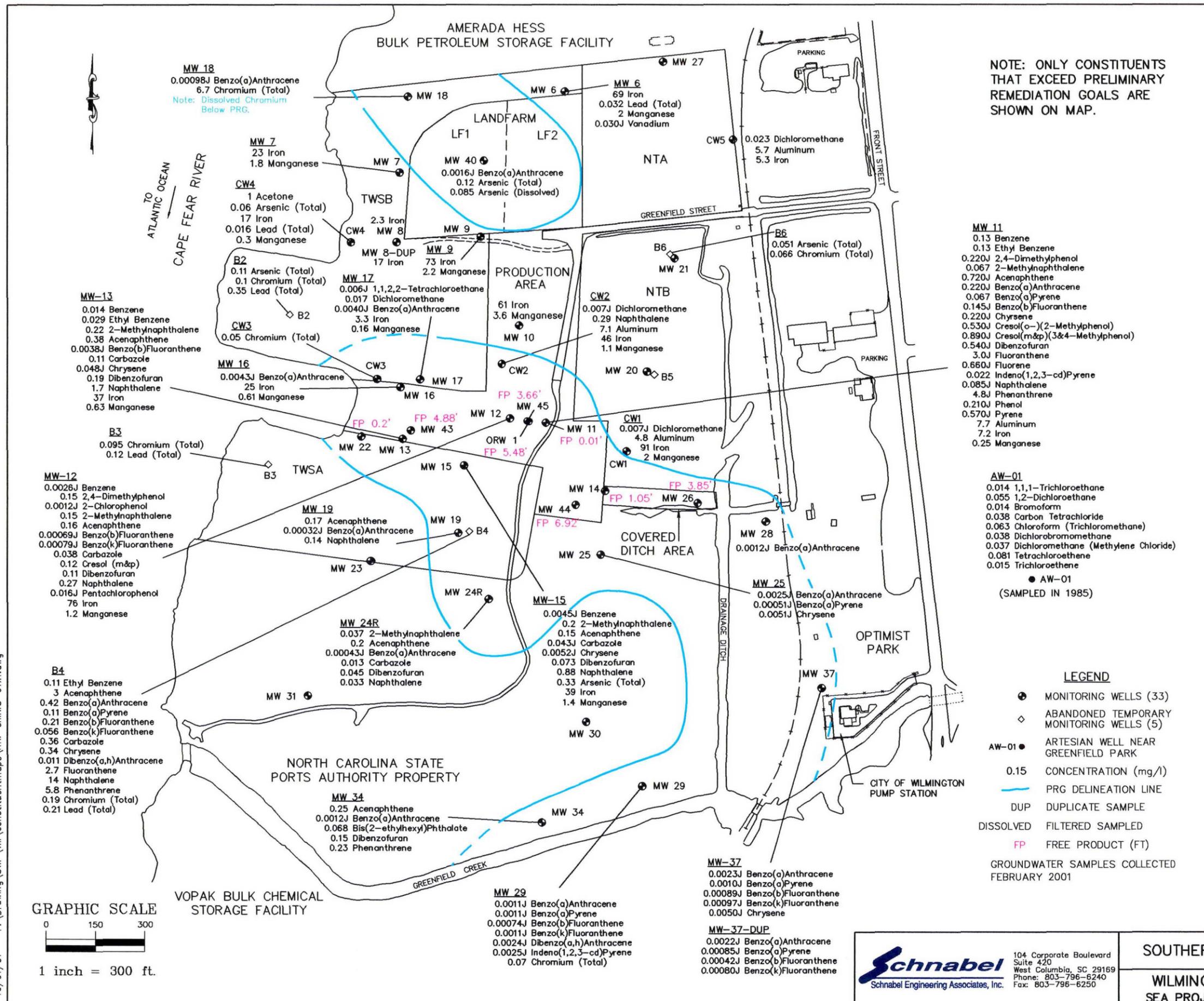
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SOUTHERN WOOD PIEDMONT
WILMINGTON, NC FACILITY
SEA PROJECT NO. 979007.A0-26

SHALLOW AQUIFER DIOXINS/
FURANS PRELIMINARY
REMEDIATION GOALS

FIGURE 22

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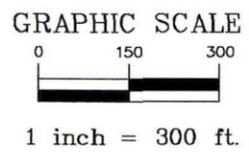
NOTE: ONLY CONSTITUENTS THAT EXCEED PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals				
GROUP	CONSTITUENT	MDL	PRG	
METALS	Aluminum		3.6**	
	Arsenic (Total)	0.0032	0.050	
	Barium		2.0	
	Cadmium		0.005	
	Calcium		-	
	Chromium (Total)	0.0017	0.050	
	Cobalt		0.220**	
	Copper (Total)	0.00090	1.0	
	Iron		1.1**	
	Lead (Total)		0.015	
	Magnesium		-	
	Manganese		0.088**	
	Mercury		0.0011	
	Nickel		0.10	
	Potassium		-	
	Selenium		0.050	
	Sodium		-	
	Vanadium		0.026**	
	Zinc		2.10	
	VOLATILES	1,1,1-Trichloroethane		0.002
1,1,2,2-Tetrachloroethane			0.00017	
1,1-Dichloroethane			0.007	
1,2-Dichloroethane			0.00038	
Acetone		0.0099	0.70	
Benzene		0.00027	0.001	
Bromodichloroethane			-	
Bromoform			0.00019	
Carbon Tetrachloride			0.0003	
Chlorobenzene			0.050	
Chloroform (Trichloromethane)			0.00019	
Chloromethylpropane			-	
Dichlorobromomethane			0.0006	
Dichloromethane (Methylene Chloride)		0.00031	0.005	
Ethyl Benzene		0.00083	0.029	
Methyl Ethyl Ketone (2-Butanone)			0.170	
Propene			-	
Tetrachloroethane			0.0007	
Toluene		0.00051	1.0	
Total Xylenes		0.0019	0.530	
Trichloroethane			0.0028	
SEMI-VOLATILES		2,4-Dimethylphenol	0.00039	0.140
		2-Chlorophenol	0.00024	0.0001
		2-Methylnaphthalene	0.00033	0.028
		Acenaphthene	0.00025	0.080
		Acenaphthylene	0.00033	0.210
		Anthracene	0.00033	2.10
		Benzo(a)Anthracene	0.00030	0.00005
		Benzo(a)Pyrene	0.00041	0.000047
		Benzo(b)Fluoranthene	0.00028	0.000047
	Benzo(a,h,i)Perylene	0.00072	0.00047	
	Benzo(k)Fluoranthene	0.00068	0.210	
	Bis(2-ethylhexyl)Phthalate	0.00048	0.003	
	Carbazole	0.00054	0.0034**	
	Chrysene	0.00044	0.005	
	Cresol(o)(2-Methylphenol)	0.00029	0.18**	
	Cresol(m&p)(3&4-Methylphenol)	0.00071	0.0035	
	Dibenzo(a,h)Anthracene	0.00080	0.000047	
	Dibenzofuran	0.00029	0.028	
	Di-n-butyl Phthalate	0.00026	0.70	
	Fluoranthene	0.00033	0.280	
	Fluorene	0.00038	0.280	
	Indeno(1,2,3-cd)Pyrene	0.00056	0.000047	
	Naphthalene	0.00036	0.021	
	Pentachlorophenol	0.00040	0.0003	
	Phenanthrene	0.00033	0.210	
Phenol	0.00028	0.30		
Pyrene	0.00053	0.210		
Tetrachlorophenols	0.00061	0.210		

MW 11
 0.13 Benzene
 0.13 Ethyl Benzene
 0.220J 2,4-Dimethylphenol
 0.067 2-Methylnaphthalene
 0.720J Acenaphthene
 0.220J Benzo(a)Anthracene
 0.067 Benzo(a)Pyrene
 0.145J Benzo(b)Fluoranthene
 0.220J Chrysene
 0.530J Cresol(o)-(2-Methylphenol)
 0.890J Cresol(m&p)(3&4-Methylphenol)
 0.540J Dibenzofuran
 3.0J Fluoranthene
 0.660J Fluorene
 0.022 Indeno(1,2,3-cd)Pyrene
 0.085J Naphthalene
 4.8J Phenanthrene
 0.210J Phenol
 0.570J Pyrene
 7.7 Aluminum
 7.2 Iron
 0.25 Manganese

AW-01
 0.014 1,1,1-Trichloroethane
 0.055 1,2-Dichloroethane
 0.014 Bromoform
 0.038 Carbon Tetrachloride
 0.063 Chloroform (Trichloromethane)
 0.038 Dichlorobromomethane
 0.037 Dichloromethane (Methylene Chloride)
 0.081 Tetrachloroethane
 0.015 Trichloroethane
 ● AW-01
 (SAMPLED IN 1985)

- LEGEND
- ⊕ MONITORING WELLS (33)
 - ◇ ABANDONED TEMPORARY MONITORING WELLS (5)
 - AW-01 ARTESIAN WELL NEAR GREENFIELD PARK
 - 0.15 CONCENTRATION (mg/l)
 - PRG DELINEATION LINE
 - DUP DUPLICATE SAMPLE
 - DISSOLVED FILTERED SAMPLED
 - FP FREE PRODUCT (FT)
 - GROUNDWATER SAMPLES COLLECTED FEBRUARY 2001



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SOUTHERN WOOD PIEDMONT
 WILMINGTON, NC FACILITY
 SEA PROJECT NO. 979007.A0-26

SHALLOW AQUIFER
 PRELIMINARY
 REMEDIATION GOALS
 FIGURE 21

- NOTES:
- All results are in mg/L by USEPA Methods.
 - Method Detection Limit (MDL).
 - Preliminary Remediation Goal (PRG). The PRG is the least stringent of:
 - the health-based remediation goals shown in Table 4-2 (IHSP),
 - the MDL or
 - natural background concentrations (metals only).
 - IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
 - **The USEPA Region 9 PRG tapwater concentrations (adjusted for non-carcinogenicity). An Interim 2L standard must be calculated for Carbazole and o-Cresol (2-Methylphenol).
 - J. Estimated value.
 - MW-18 and MW-40 were analyzed for both total and dissolved Chromium and Arsenic. Dissolved Chromium and Arsenic samples were filtered with a .45 micron filter by the laboratory prior to analysis.
 - Only detected constituents are listed in the PRG table.
 - "-" No PRG determined.
 - Inorganic analyses from B2-B6 temporary wells most likely represent suspended soil particles in the sample. The wells were installed, sampled and removed. The samples were likely turbid.
 - The CW wells were installed and sampled by others. All inorganic constituents are considered background suspended soil particles.
 - Aluminum, Iron, Manganese, Lead, Vanadium and Chloroform are not wood-treatment plant related constituents and not considered a PRG exceedance.

10/01/01 G:\Drawing\SWP\W\constituentmaps\mw-interB-01x1.dwg

NOTE: ONLY CONSTITUENTS THAT EXCEED PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

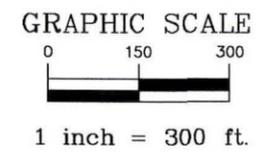
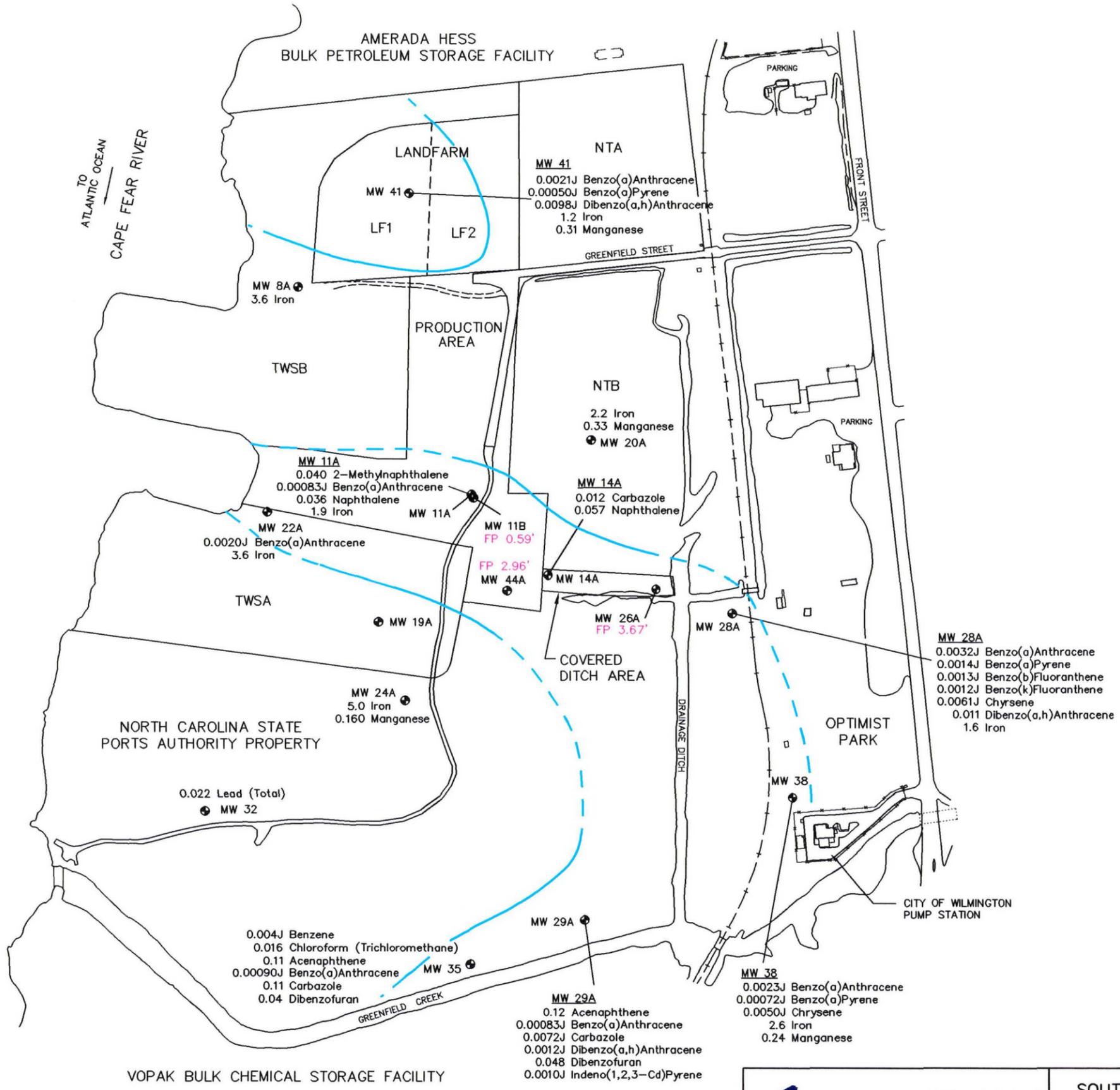
Preliminary Remediation Goals			
GROUP	CONSTITUENT	MDL	PRG
METALS	Aluminum		3.6**
	Arsenic	0.0032	0.050
	Cadmium		0.005
	Calcium		
	Chromium	0.0017	0.050
	Copper	0.00090	1.0
	Iron		1.1**
	Lead		0.015
	Magnesium		
	Manganese		0.088**
	Nickel		0.10
	Potassium		
	Sodium		
	Vanadium		0.026**
	Zinc		2.10
VOLATILES	1,1,1-Trichloroethane		0.20
	Acetone	0.0099	0.70
	Benzene	0.00027	0.001
	Chloroform (Trichloromethane)		0.00019
	Dichlorobromomethane		0.0006
	Dichloromethane (Methylene Chloride)	0.00031	0.005
	Ethyl Benzene	0.00083	0.029
Total Xylenes	0.0019	0.530	
SEMI-VOLATILES	2-Methylnaphthalene	0.00033	0.028
	Acenaphthene	0.00025	0.080
	Anthracene	0.00033	2.10
	Benzo(a)Anthracene	0.00030	0.00005
	Benzo(a)Pyrene	0.00041	0.000047
	Benzo(b)Fluoranthene	0.00028	0.000047
	Benzo(a,h)Perylene	0.00072	0.00047
	Benzo(k)Fluoranthene	0.00068	0.210
	Bis(2-ethylhexyl)Phthalate	0.00048	0.003
	Carbazole	0.00054	0.0034**
	Chrysene	0.00044	0.005
	Dibenzo(a,h)Anthracene	0.00080	0.000047
	Dibenzofuran	0.00029	0.028
	Di-n-butyl Phthalate	0.00026	0.70
	Fluoranthene	0.00033	0.280
	Fluorene	0.00038	0.280
	Indeno(1,2,3-cd)Pyrene	0.00056	0.000047
	Naphthalene	0.00036	0.021
Phenanthrene	0.00033	0.210	
Pyrene	0.00053	0.210	

- NOTES:
- All results are in mg/L by USEPA Methods.
 - Method Detection Limit (MDL).
 - Preliminary Remediation Goal (PRG). The PRG is the least stringent of:
 - the health-based remediation goals shown in Table 4-2 (IHSP);
 - the MDL or
 - natural background concentrations (metals only).
 - IHSP: Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
 - **The USEPA Region 9 PRG tapwater concentrations (adjusted for non-carcinogenicity). An interim 2L standard must be calculated for Carbazole.
 - J. Estimated value.
 - Only detected constituents are listed in the PRG table.
 - Lead, Iron and Manganese are not wood-treatment plant related constituents and are considered naturally occurring not a PRG exceedance.
 - "-" No PRG determined.

LEGEND

- MONITORING WELLS (16)
- 0.12 CONCENTRATION (mg/l)
- PRG DELINEATION LINE
- FP FREE PRODUCT (ft.)

GROUNDWATER SAMPLES COLLECTED FEBRUARY 2001

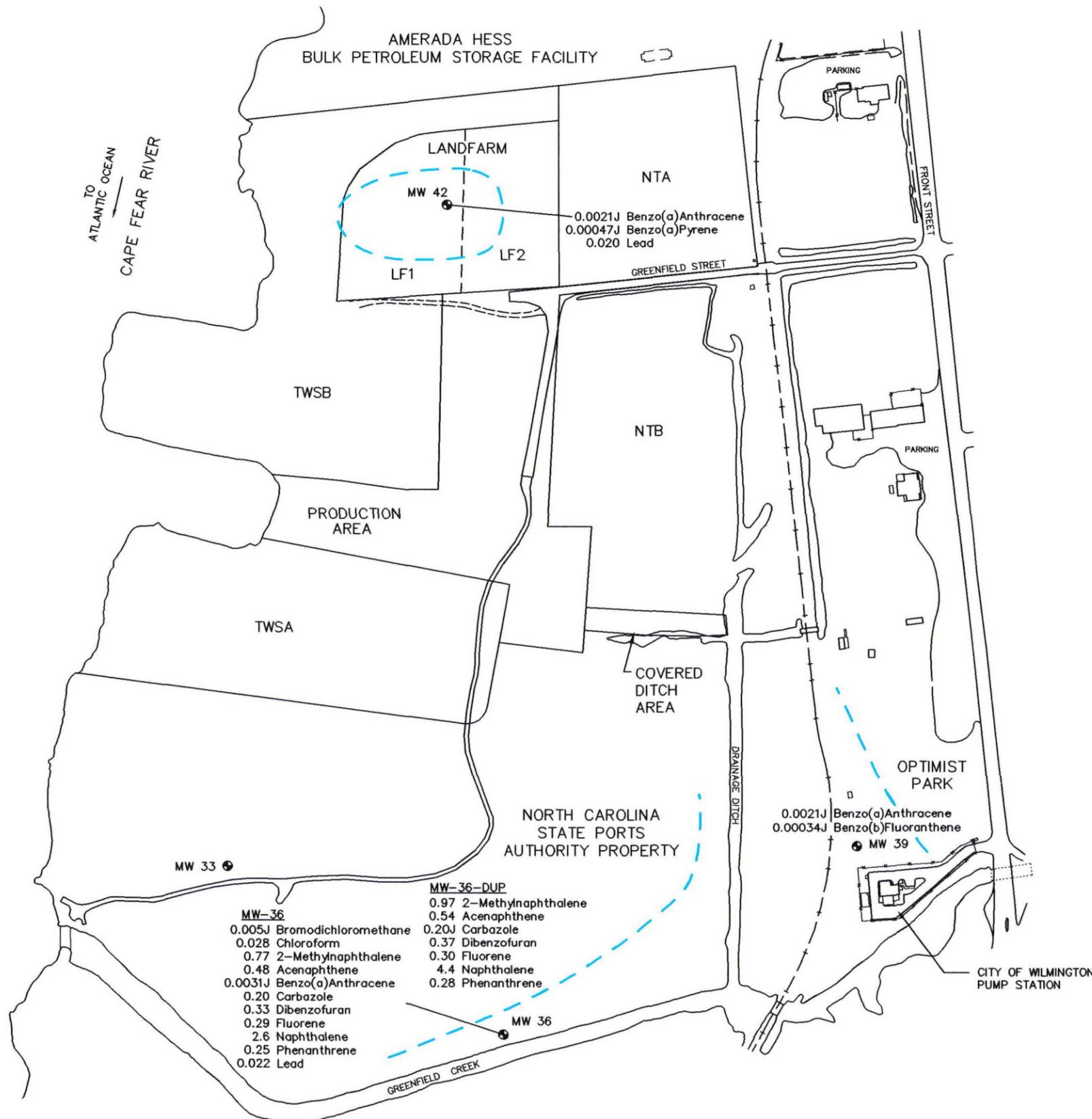


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SOUTHERN WOOD PIEDMONT
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SEA PROJECT NO. 979007.A0-26

INTERMEDIATE AQUIFER
PRELIMINARY
REMEDIAL GOALS
FIGURE 23

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NOTE: ONLY CONSTITUENTS THAT EXCEED PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals			
GROUP	CONSTITUENT	MDL	PRG
METALS	Aluminum		3.6**
	Arsenic	0.0032	0.050
	Barium		2.0
	Calcium		-
	Chromium	0.0017	0.050
	Copper	0.00090	1.0
	Iron		1.1**
	Lead		0.015
	Magnesium		-
	Manganese		0.088**
	Nickel		0.10
	Potassium		-
	Sodium		-
	Vanadium		0.026**
Zinc		2.10	
VOLATILES	Acetone	0.0099	0.70
	Bromodichloromethane		0.0006
	Chloroform		0.00019
	Dichloromethane (Methylene Chloride)	0.00031	0.005
	Ethyl Benzene	0.00083	0.029
	Total Xylenes	0.0019	0.530
SEMI-VOLATILES	2-Methylnaphthalene	0.00033	0.028
	Acenaphthene	0.00025	0.080
	Anthracene	0.00033	2.10
	Benzo(a)Anthracene	0.00030	0.00005
	Benzo(a)Pyrene	0.00041	0.000047
	Benzo(b)Fluoranthene	0.00028	0.000047
	Carbazole	0.00054	0.0034**
	Chrysene	0.00044	0.005
	Dibenzofuran	0.00029	0.028
	Di-n-butyl Phthalate	0.00026	0.70
	Fluoranthene	0.00033	0.280
	Fluorene	0.00038	0.280
	Naphthalene	0.00036	0.021
	Phenanthrene	0.00033	0.210
Pyrene	0.00053	0.210	

NOTES:

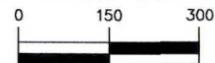
- All results are in mg/L by USEPA Methods.
- Method Detection Limit (MDL).
- Preliminary Remediation Goal (PRG). The PRG is the least stringent of: (i) the health-based remediation goals shown in Table 4-2 (IHSP); (ii) the MDL or (iii) natural background concentrations (metals only).
- IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
- **The USEPA Region 9 PRG tapwater concentrations (adjusted for non-carcinogenicity). An Interim 2L standard must be calculated for Carbazole.
- J. Estimated value.
- Only detected constituents are listed in the PRG table.
- Lead is not a wood-treatment plant related constituent and is considered naturally occurring not a PRG exceedance.
- No PRG determined.

LEGEND

- ⊕ MONITORING WELLS (4)
- 0.20 CONCENTRATION (mg/l)
- PRG DELINEATION LINE

GROUNDWATER SAMPLES COLLECTED FEBRUARY 2001

GRAPHIC SCALE



1 inch = 300 ft.

VOPAK BULK CHEMICAL STORAGE FACILITY

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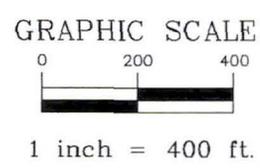
DEEP AQUIFER
PRELIMINARY
REMEDIAL GOALS
FIGURE 24

AMERADA HESS
BULK PETROLEUM STORAGE FACILITY



VOPAK BULK CHEMICAL STORAGE FACILITY

NORTH CAROLINA STATE
PORTS AUTHORITY PROPERTY



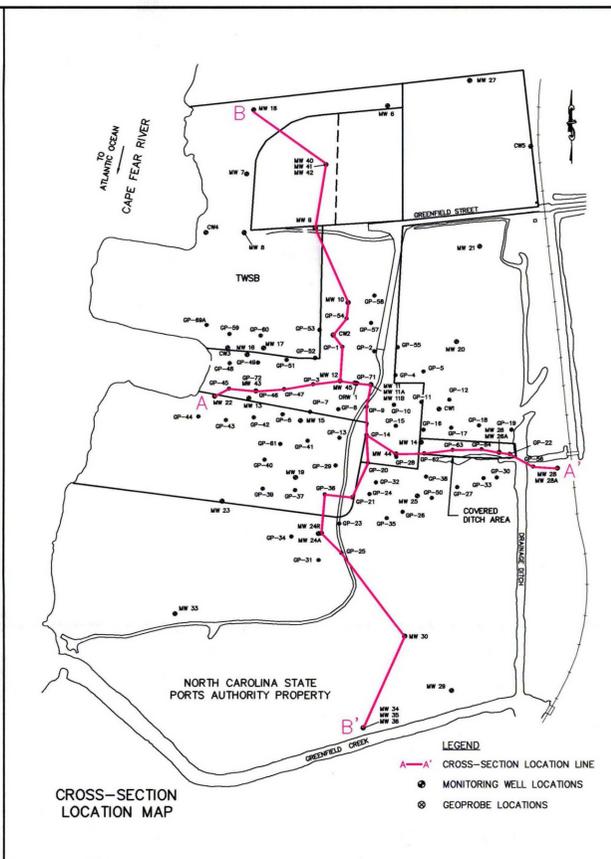
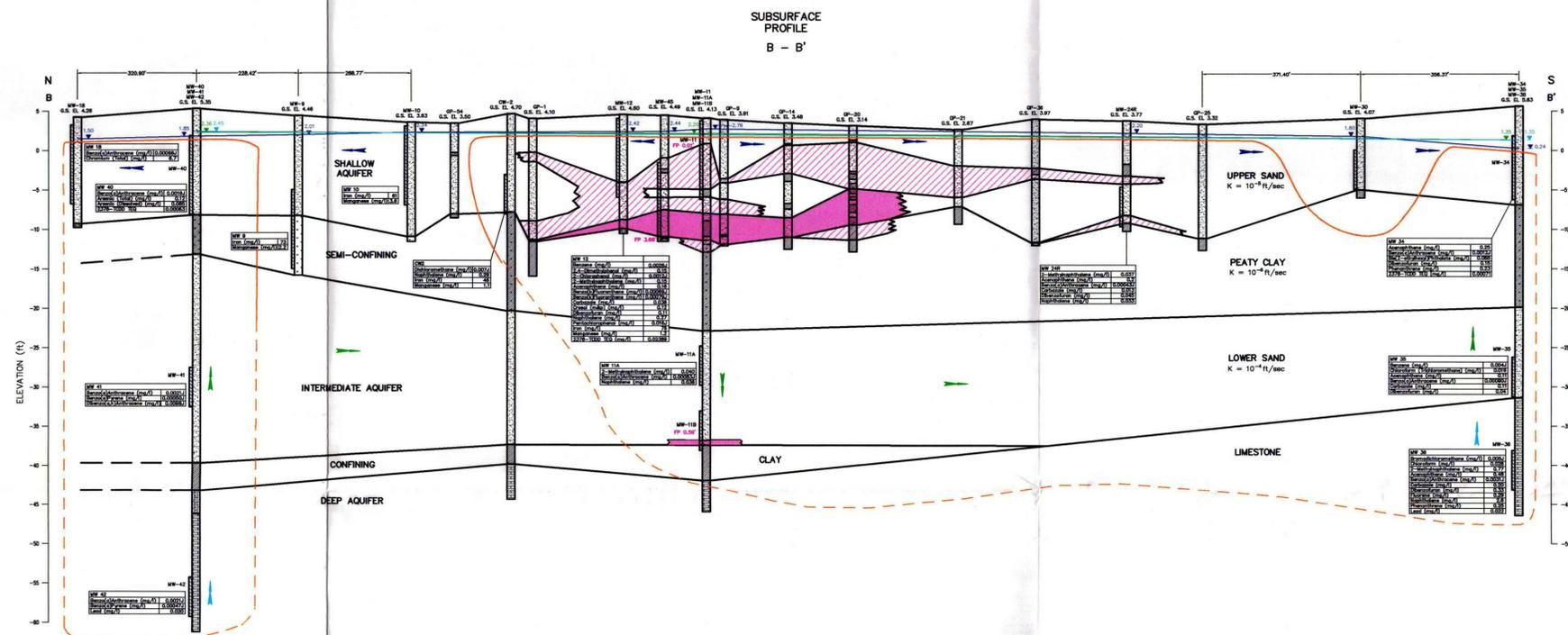
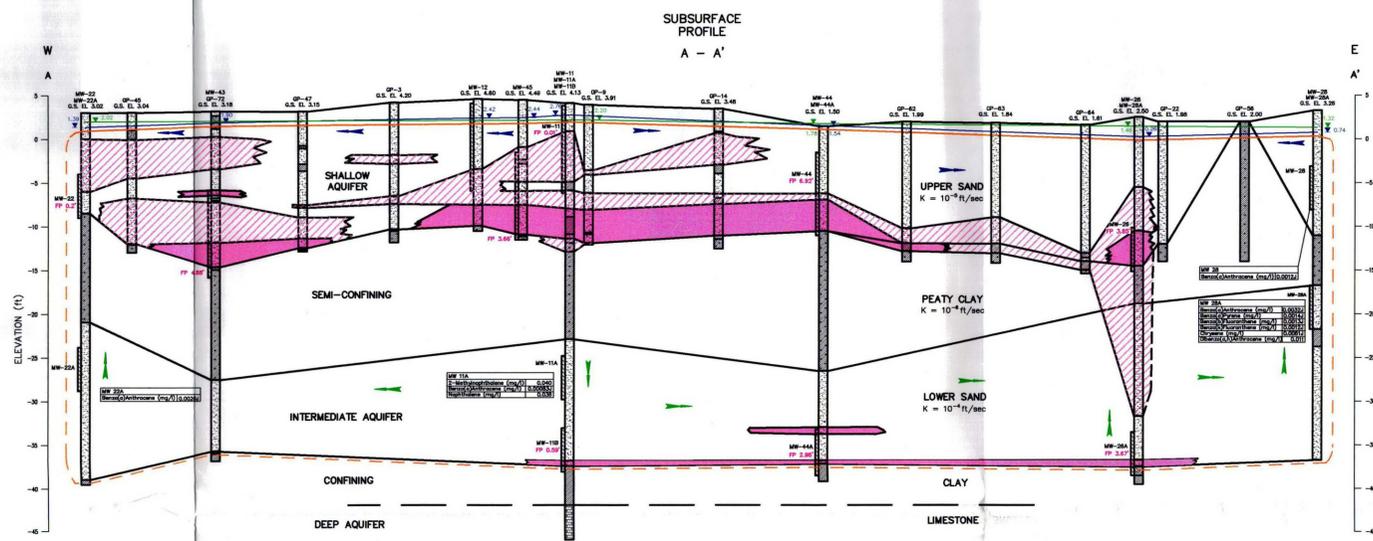
- LEGEND**
- MONITORING WELL LOCATIONS (39)
 - ⊗ GEOPROBE LOCATIONS (73)
 - 8.48 ELEVATION TOP OF PEAT
 - ISOELEVATION CONTOUR
 - PUMPABLE DNAPL
 - ▨ RESIDUAL DNAPL
 - FP FREE PRODUCT MEASURED FEBRUARY 15, 2001 (ft)

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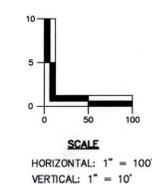
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WILMINGTON, NC FACILITY
SEA PROJECT NO. 979007.A0-26

**TOP OF PEAT
STRUCTURE AND DNAPL
EXTENT MAP**
FIGURE 25



- LEGEND**
- POORLY-GRADED SANDS (SP)
 - SILTY SANDS (SM)
 - CLAYEY SANDS (SC)
 - INORGANIC SILTS (ML)
 - INORGANIC CLAYS (CL)
 - ORGANIC SILTS (MH)
 - PEAT (PT)
 - CLAYEY PEAT (PT/CL)
 - LIMESTONE
 - PUMPABLE DNAPL
 - RESIDUAL DNAPL
 - LITHOLOGIC LOG
 - WELL SCREEN
 - SHALLOW AQUIFER GROUNDWATER ELEVATION
 - INTERMEDIATE AQUIFER GROUNDWATER ELEVATION
 - DEEP AQUIFER GROUNDWATER ELEVATION
 - 0.014 CONSTITUENT CONCENTRATION EXCEEDS PRELIMINARY REMEDIATION GOAL
 - K HYDRAULIC CONDUCTIVITY
 - GROUNDWATER VERTICAL AND HORIZONTAL HYDRAULIC GRADIENT
 - INFERRED CONTACTS
 - CONTACTS
 - PRELIMINARY REMEDIATION GOAL DELINEATION LINE
 - FP FREE PRODUCT (FT)

- NOTES:**
- THIS PROFILE WAS DEVELOPED BY INTERPOLATION BETWEEN WIDELY SPACED BORINGS. ONLY AT THE BORING LOCATIONS SHOULD IT BE CONSIDERED AS AN APPROXIMATE REPRESENTATION AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOGS.
 - ALL DNAPL OBSERVATIONS ARE FROM BORING AND GEOPROBE LOGS. DNAPL THICKNESS MEASURED IN MONITORING WELLS VARIES SOMEWHAT.
 - GROUNDWATER DATA COLLECTED FEBRUARY 2001.
 - ONLY CONSTITUENTS THAT EXCEED PRELIMINARY REMEDIATION GOALS (PRGs) ARE SHOWN ON MAP.
 - ALL LABORATORY RESULTS ARE IN mg/L.
 - "J" ESTIMATED VALUE
 - MW-18 AND MW-40 WERE ANALYZED FOR BOTH TOTAL AND DISSOLVED CHROMIUM AND ARSENIC. MW-18 WAS BELOW THE PRG FOR CHROMIUM AND ARSENIC. MW-40 WAS BELOW PRG FOR CHROMIUM.
 - ALUMINUM, IRON, MANGANESE, LEAD, VANADIUM AND CHLOROFORM ARE NOT WOOD-TREATMENT PLANT RELATED CONSTITUENTS AND ARE NOT CONSIDERED A PRG EXCEEDANCE.



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PROJECT: SOUTHERN WOOD PIEDMONT COMPANY WILMINGTON, NORTH CAROLINA FACILITY

SHEET TITLE: HYDROGEOLOGIC CROSS-SECTIONS A-A' & B-B'

DESIGNED BY: DRAWN BY: CHECKED BY:

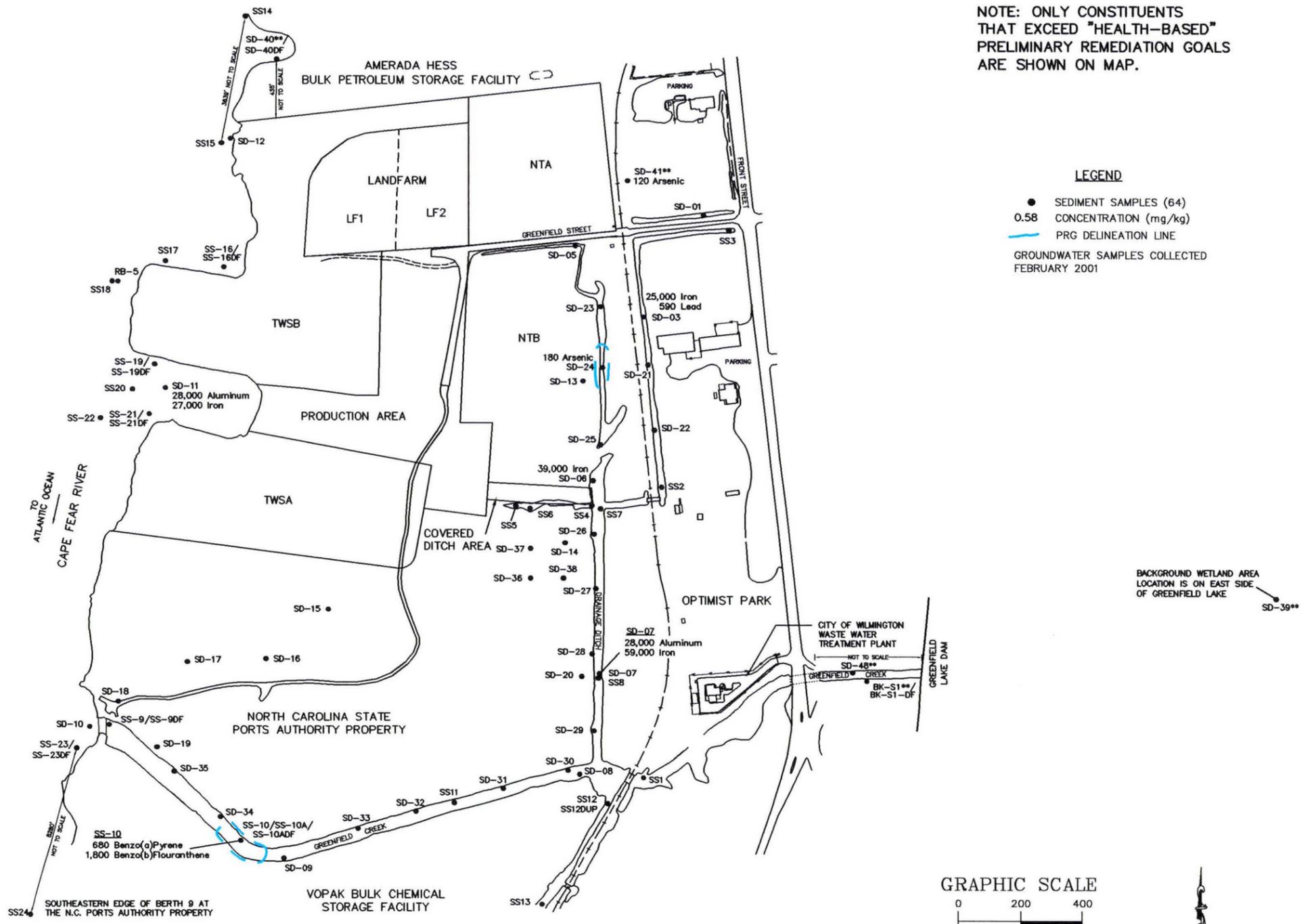
Schnabel Schnabel Engineering Associates, Inc. 104 Corporate Boulevard Suite 420 West Columbia, SC 29169 Phone: 803-796-6240 Fax: 803-796-6250

SCALE: SHOWN DATE: 10/01/01 FIGURE NO: 26 SHEET:

REV.	DESCRIPTION	DATE

10/01/01 F:\Drawings\3000\WIL\Cross-sections\SPR_A&B.dwg

Preliminary Remediation Goals							
Group	Constituent	Background PRG	Health Residential PRG	Health Industrial PRG	Site Specific Industrial PRG	Present in Surface Water	
METALS	Aluminum	1,700	15,200	20,000		***YES	
	Arsenic	120	4.4	88	40	***YES	
	Barium		1,080	20,000		***YES	
	Cadmium		7.4	182		NO	
	Calcium			30	64	***YES	
	Chromium	19	840	20,000	13,390	NO	
	Cobalt		28	580	15,200	***YES	
	Copper		2.2	7		***YES	
	Cyanide	930	4,600	20,000		***YES	
	Lead	6	400	400		***YES	
	Magnesium			360	6,400	***YES	
	Manganese			320	8,200	NO	
	Nickel			78	2,000	NO	
	Potassium			110	2,800	***YES	
	Selenium			4,600	20,000	***YES	
	Sodium			0.35	0.77	NO	
	Vanadium			0.021J	320	1240	NO
	Zinc						NO
	VOLATILES	1,2-Dichloropropane					NO
		Acetone	0.021J				NO
		Camphene					NO
Dichloromethane (Methylene Chloride)			8.9	21		NO	
Dihydromethylindene						NO	
Ethylbenzene			300	300		NO	
Ethylmethylbenzene						NO	
Ethylmethylbenzene (2 isomers)						NO	
Ethylmethylbenzene (3 isomers)						NO	
Indane						NO	
Indene						NO	
m,p-Xylene			210	210		NO	
Methyl Ethyl Ketone (2-Butanone)		0.021J	1460	5600		NO	
Methylbenzofuran (2 isomers)						NO	
Methylbenzofuran (3 isomers)						NO	
Methylindan						NO	
O-Xylene						NO	
Tetramethylbenzene			210	210		NO	
Toluene						***YES	
Total Xylenes			104	520		NO	
Trimethylbenzene			210	210		NO	
Trimethylbenzene (2 isomers)					NO		
SEMI-VOLATILES	1-Methylnaphthalene					NO	
	2-Chloronaphthalene	0.024	460	10,800		NO	
	2-Methylnaphthalene		11.2	38		NO	
	4-Chloro-3-Methylphenol		740	7,600		NO	
	Acenaphthene					NO	
	Acenaphthylene					NO	
	Aminofluorenone					NO	
	Anthracene		4,400	20,000		NO	
	Anthracene carbonitrile					NO	
	Benzo(a)Anthracene	0.088J	0.62	2.9	738	NO	
	Benzo(a)Pyrene	0.052J	0.062	0.29	74	NO	
	Benzo(b)Fluoranthene	0.053J	0.62	2.9	738	NO	
	Benzo(b)Fluoranthene					NO	
	Benzo(k)Fluoranthene	0.064J	6.2	29	7,394	NO	
	Benzo(a)fluoranthene					NO	
	Benzo(a)fluoranthene (not b or k)					NO	
	Benzo(a)fluoranthene (not b or k)(2 isomers)					NO	
	Benzo(a)fluorene					NO	
	Benzo(a)fluorene (2 isomers)					NO	
	Benzo(a)fluorene (3 isomers)					NO	
	Benzo(a)phenanthrene					NO	
	Benzo(a)phenanthrene (2 isomers)					NO	
	Benzo(a)pyrene (not a)					NO	
	Benzo(b)fluoranthene		35	180		NO	
	Carbazole		24	120	25,810	NO	
	Chrysene	0.096J	62	290	73,944	NO	
	Cyclopentaphenanthrene					NO	
	Cyclopentapyrene					NO	
	Dibenz(a,h)Anthracene		0.062	0.29	74	NO	
	Dibenzofuran		58	1,020		NO	
	Dibenzothiophene					NO	
	Dimethylnaphthalene (2 isomers)					NO	
	Dimethylnaphthalene (3 isomers)					NO	
	Di-n-Butyl-Phthalate	0.058J	1,220	17,600		NO	
	Fluoranthene	0.3J	460	5,000		NO	
	Fluorene		520	5,600		NO	
	Hexachlorobiphenyl					NO	
	Hexahydroxytrimehyl					NO	
	Indeno(1,2,3-cd)Pyrene		0.62	29	738	NO	
	Methylanthracene					NO	
	Methylanthracene (2 isomers)					NO	
	Methylchrysene					NO	
Methylfluorene					NO		
Methylfluorene (2 isomers)					NO		
Methylphenanthrene (2 isomers)					NO		
Methylphenanthrene (3 isomers)					NO		
Methylpyrene					NO		
Naphthalene		11.2	38	137,656	NO		
Octahydrodithienyl (Methylethyl)					NO		
Pentachlorobiphenyl (2 isomers)					NO		
Pentachlorophenol		3	11		NO		
Perylene					NO		
Phenanthrene					NO		
Phenylanthracene		460	10,800		NO		
Pyrene					NO		
Tetramethylphenanthrene					NO		
PESTICIDES & PCB'S	4,4-DDD (P,P'-DDD)	0.0059	2.4	17		NO	
	4,4-DDE (P,P'-DDE)	0.0074	1.7	12		NO	
	4,4-DDT (P,P'-DDT)		1.7	12		NO	
	Aldrin		0.029	0.15		NO	
	Delta-BHC		0.32			NO	
	Dieldrin		0.03	0.15		NO	
	Endosulfan II (Beta)		74	1060		NO	
	Endosulfan Sulfate		74	1060		NO	
	Endrin Aldehyde		3.6	0.52		NO	
	Gamma-Chlordane/2		1.6	11		NO	
Methoxychlor		62	880		NO		
PCB-1260 (Arochlor 1260)		1	1		***YES		



- NOTES:
- All results are in mg/kg dw by USEPA Methods.
 - Preliminary Remediation Goals (PRG). Two soil remediation goals are recommended: (i) a "health-based" goal for total concentration of contaminants; and (ii) a "Protection-of-Surface Water" goal for residual contamination.
 - Residential health-based remediation goals are from Table 4-1 of IHSP. Industrial health-based remediation goals are from USEPA Region 9 PRG table downloaded on August 20, 2001.
 - IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
 - Site-specific health-based remediation goals are calculated based on actual future site use scenarios.
 - J. Estimated value.
 - Only detected constituents are listed in the PRG table.
 - ***Detected at background concentrations.
 - - - Not analyzed or no PRG determined.
 - Since contaminated sediments are located in a wetland area, NCDENR must be contacted for final remediation goals.
 - Aluminum, Iron and lead are not wood-treatment plant related constituents and are considered naturally occurring concentrations not exceedances of PRGs.
 - SS-10 was resampled (SS-10A). SS-10A is below sediment PRGs. A suspected off-site source (former Chevron Asphalt Terminal) is present immediately south of SS-10 on south bank of Greenfield Creek.
 - ** Background locations.

	104 Corporate Boulevard Suite 420 West Columbia, SC 29169 Phone: 803-796-6240 Fax: 803-796-6250	SOUTHERN WOOD Piedmont WILMINGTON, NC FACILITY SEA PROJECT NO. 979007.A0-26	SEDIMENT PRELIMINARY REMEDIATION GOALS FIGURE 27
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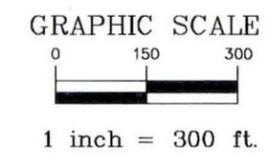
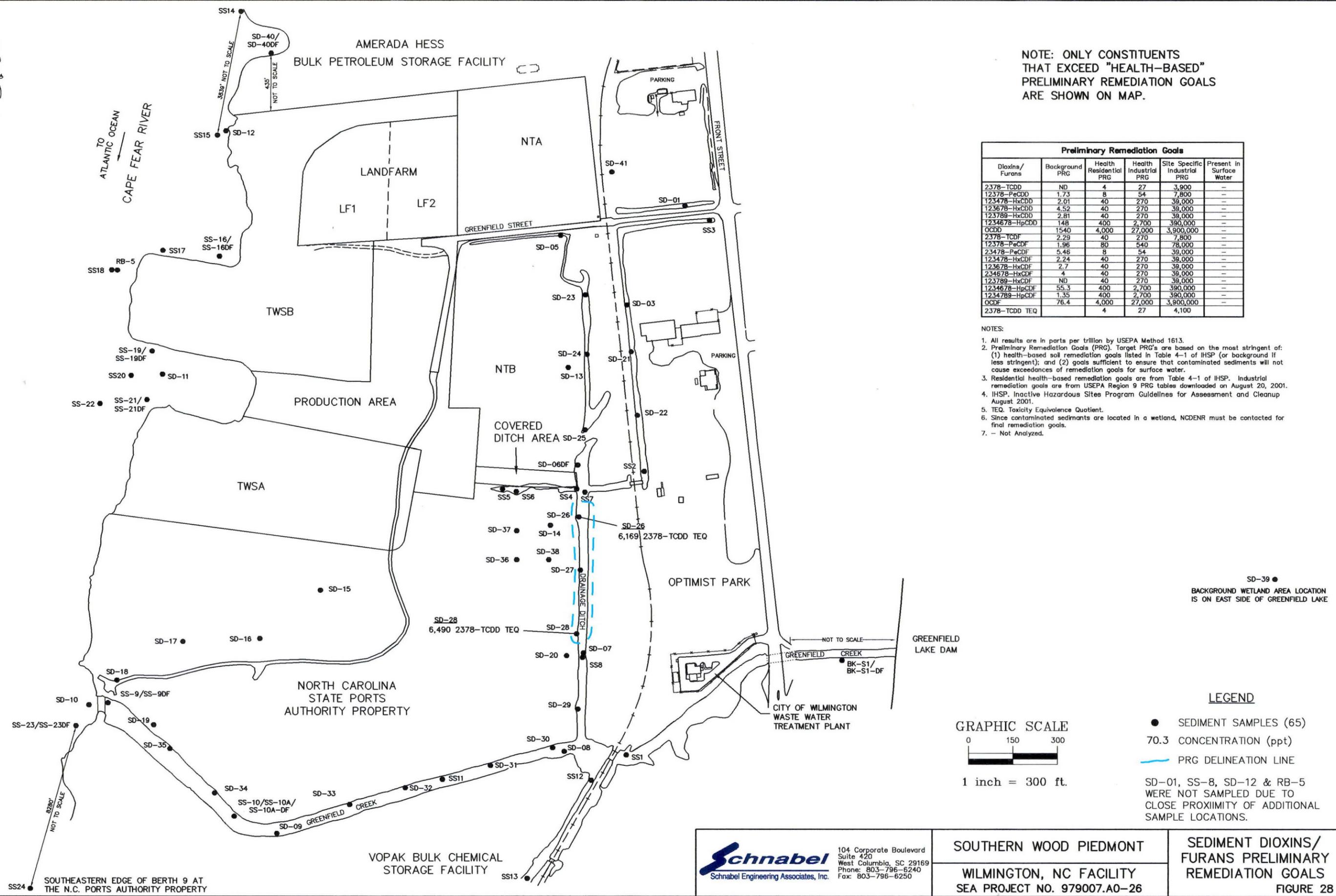
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NOTE: ONLY CONSTITUENTS THAT EXCEED "HEALTH-BASED" PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals					
Dioxins/Furans	Background PRG	Health Residential PRG	Health Industrial PRG	Site Specific Industrial PRG	Present in Surface Water
2378-TCDD	ND	4	27	3,900	-
12378-PeCDD	1.73	8	54	7,800	-
123478-HxCDD	2.01	40	270	39,000	-
123678-HxCDD	4.52	40	270	39,000	-
123789-HxCDD	2.81	40	270	39,000	-
1234678-HpCDD	148	400	2,700	390,000	-
OCDD	1540	4,000	27,000	3,900,000	-
2378-TCDF	2.29	40	270	7,800	-
12378-PeCDF	1.96	80	540	78,000	-
123478-HxCDF	5.48	8	54	39,000	-
123478-HxCDF	2.24	40	270	39,000	-
123678-HxCDF	2.7	40	270	39,000	-
1234678-HpCDF	4	40	270	39,000	-
123789-HxCDF	ND	40	270	39,000	-
1234678-HpCDF	55.3	400	2,700	390,000	-
1234789-HpCDF	1.35	400	2,700	390,000	-
OCDF	76.4	4,000	27,000	3,900,000	-
2378-TCDD TEQ		4	27	4,100	

NOTES:

- All results are in parts per trillion by USEPA Method 1613.
- Preliminary Remediation Goals (PRG). Target PRG's are based on the most stringent of: (1) health-based soil remediation goals listed in Table 4-1 of IHSP (or background if less stringent); and (2) goals sufficient to ensure that contaminated sediments will not cause exceedances of remediation goals for surface water.
- Residential health-based remediation goals are from Table 4-1 of IHSP. Industrial remediation goals are from USEPA Region 9 PRG tables downloaded on August 20, 2001.
- IHSP. Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup August 2001.
- TEQ. Toxicity Equivalence Quotient.
- Since contaminated sediments are located in a wetland, NCDENR must be contacted for final remediation goals.
- Not Analyzed.



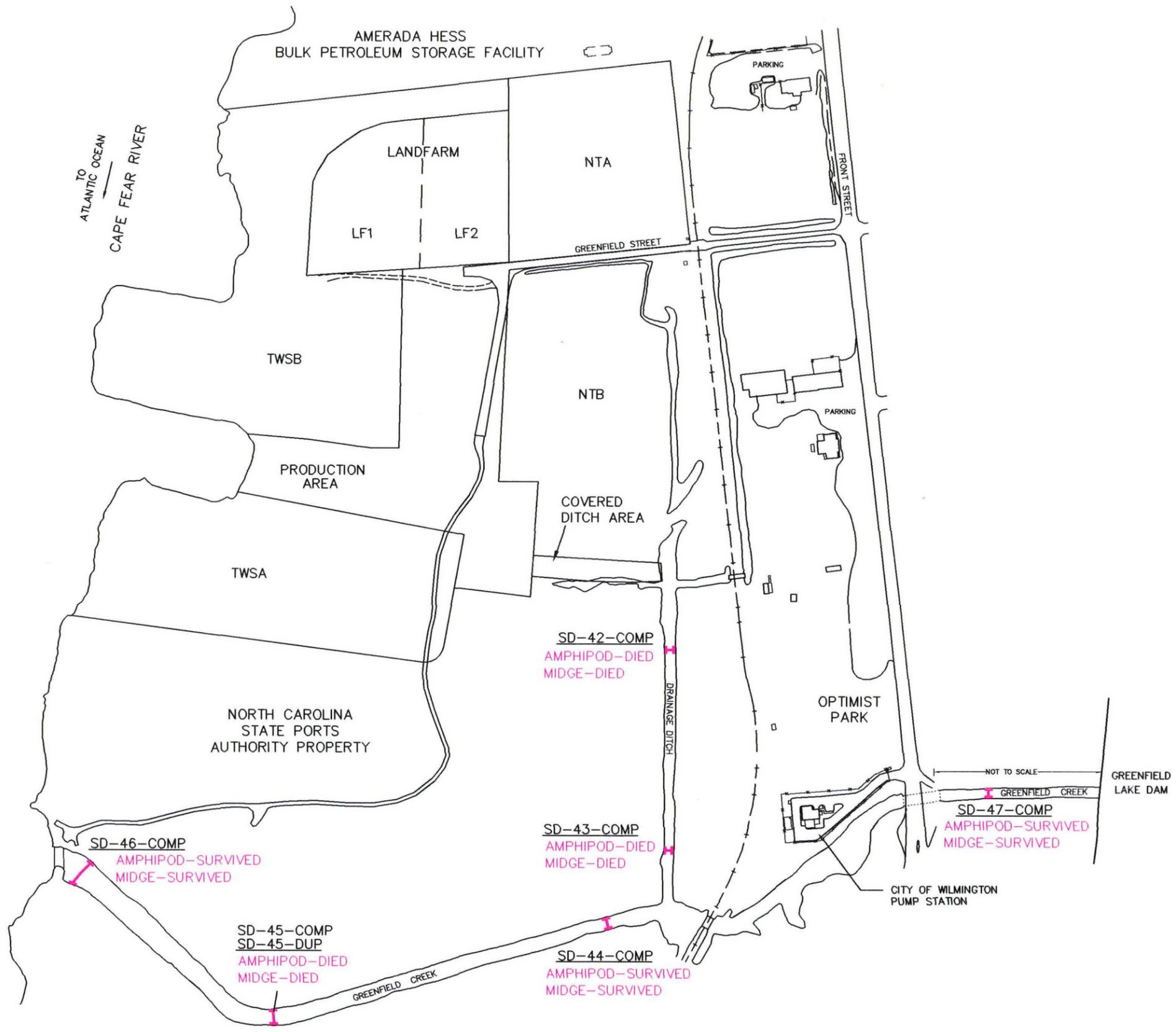
- LEGEND**
- SEDIMENT SAMPLES (65)
 - 70.3 CONCENTRATION (ppt)
 - PRG DELINEATION LINE
- SD-01, SS-8, SD-12 & RB-5 WERE NOT SAMPLED DUE TO CLOSE PROXIMITY OF ADDITIONAL SAMPLE LOCATIONS.

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**SEDIMENT DIOXINS/
FURANS PRELIMINARY
REMEDIAL GOALS**
FIGURE 28

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LEGEND
 TOXICITY ASSAY COMPOSITE
 SEDIMENT SAMPLES (6)

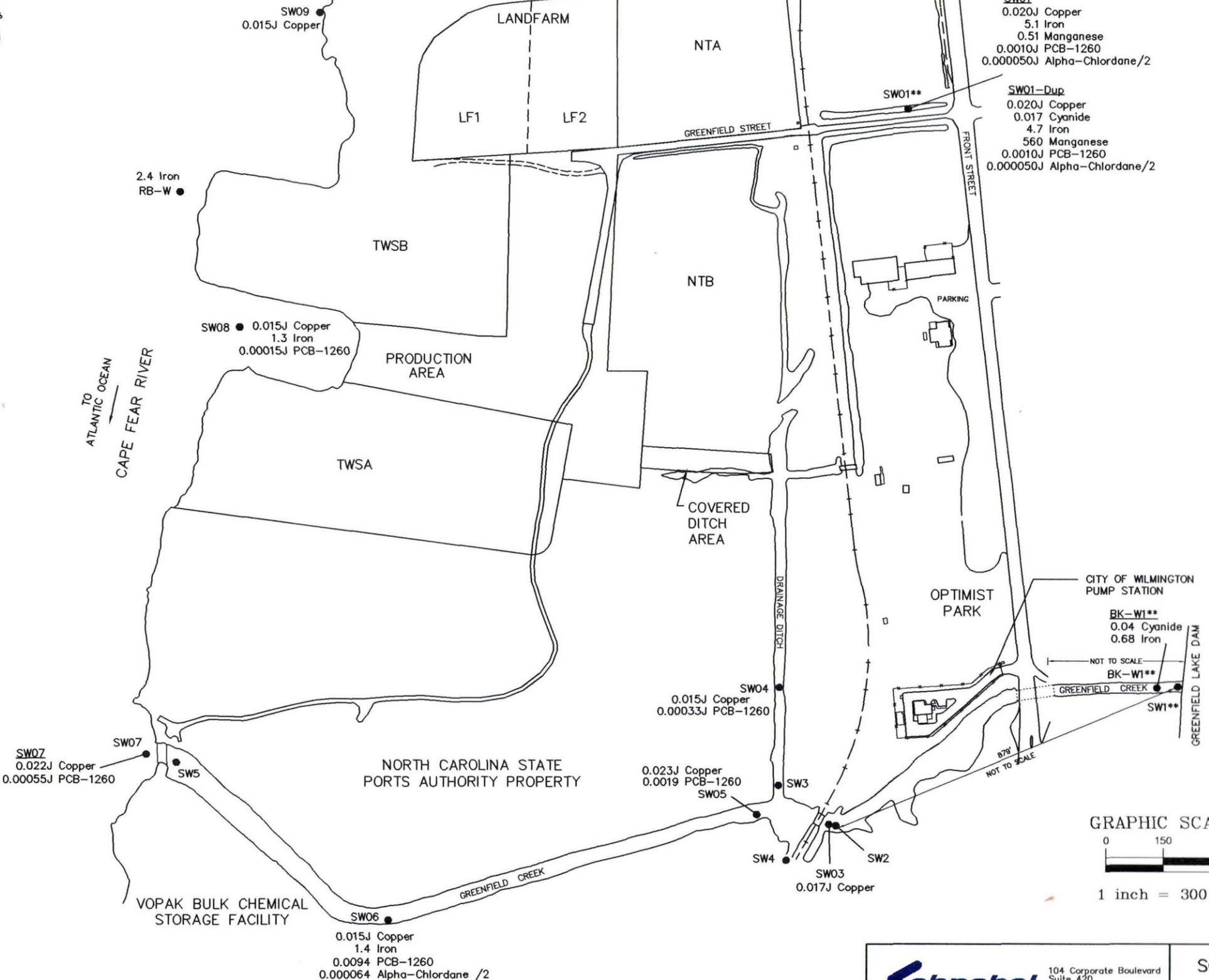
GRAPHIC SCALE
 0 150 300
 1 inch = 300 ft.

 Schnabel Engineering Associates, Inc. 104 Corporate Boulevard Suite 420 West Columbia, SC 29169 Phone: 803-796-6240 Fax: 803-796-6250	SOUTHERN WOOD PIEDMONT	SEDIMENT TOXICITY ASSAYS FIGURE 29
	WILMINGTON, NC FACILITY SEA PROJECT NO. 979007.A0-26	

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AMERADA HESS
BULK PETROLEUM STORAGE FACILITY



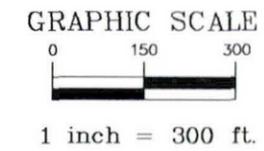
NOTE: ONLY CONSTITUENTS
THAT EXCEED PRELIMINARY
REMEDIATION GOALS ARE
SHOWN ON MAP.

NCDENR Surface Water Standards (15A NCAC 2B .0200)		
GROUP	CONSTITUENT	PRG
METALS	Aluminum	-
	Arsenic	0.05
	Barium	1
	Calcium	-
	Chromium	0.02
	Copper	0.003
	Cyanide	0.005
	Iron	1
	Lead	0.025
	Magnesium	-
	Manganese	0.2
	Potassium	-
	Sodium	-
Vanadium	-	
PESTICIDES	Zinc	0.05
	PCB-1260 (Aroclor 1260)	0.000001
	Alpha-Chlordane/2	0.000004

- NOTES:
- All results are in mg/L by USEPA Methods.
 - Method Detection Limit (MDL).
 - Preliminary Remediation Goal (PRG). The PRG is the most stringent of the Class C/WS-IV for freshwater or Class SC for tidal saltwater standards.
 - J. Estimated value.
 - Only detected constituents are listed in the PRG table.
 - Iron, Manganese, Cyanide, PCB-1260 and Alpha-Chlorodane/2 are not wood-treatment plant related constituents and are not considered a PRG exceedance.
 - "-" No PRG determined.
 - ** Background location.

LEGEND

- SURFACE WATER SAMPLES (17)
 - 0.20 CONCENTRATION (mg/l)
 - PRG DELINEATION LINE
- SURFACE WATER SAMPLES COLLECTED
FEBRUARY 2001

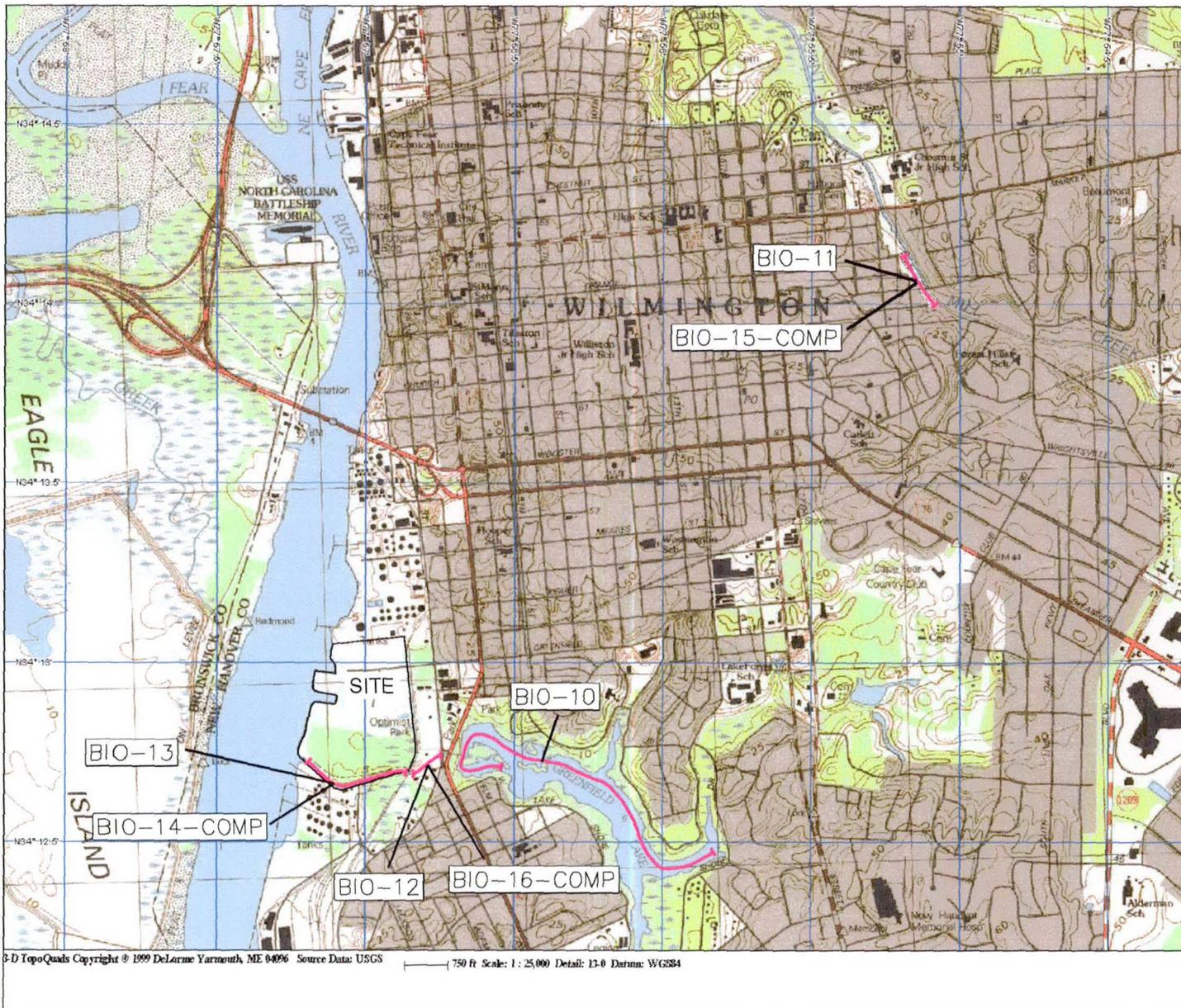


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SURFACE WATER
PRELIMINARY
REMEDIATION GOALS
FIGURE 30



NOTE: ONLY CONSTITUENTS THAT EXCEED "HUMAN-HEALTH" PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals					
Group	Constituents	BKGD RBC	Health RBC	Site Spec. RBC	Present in Surf. Water RBC
Extractable Organics	Acenaphthene	ND	81		No
	Dibenzofuran	ND	5.4		No
	Fluorene	ND	54		No
Inorganics	Chromium	ND	4.2		**Yes
	Copper	2.0	S40		**Yes

NOTES:

- All results are in mg/kg by USEPA Methods.
- Risk Based Concentration (RBC). RBC's derived from USEPA Region III April 13, 2000 Risk-Based Concentration Table for fish ingestion (54 g/d).
- Preliminary Remediation Goals are set at the least stringent of the background concentration, the RBC or the Site-Specific RBC.
- Site-Specific RBCs were not calculated because the default health RBCs were not exceeded.
- BKGD - Background
- Res. - Residential
- Spec. - Specific
- Surf. - Surface
- **Inorganics have been detected at background concentrations in ditch, creek & river samples.
- Only detected constituents are listed in the PRG table.

LEGEND

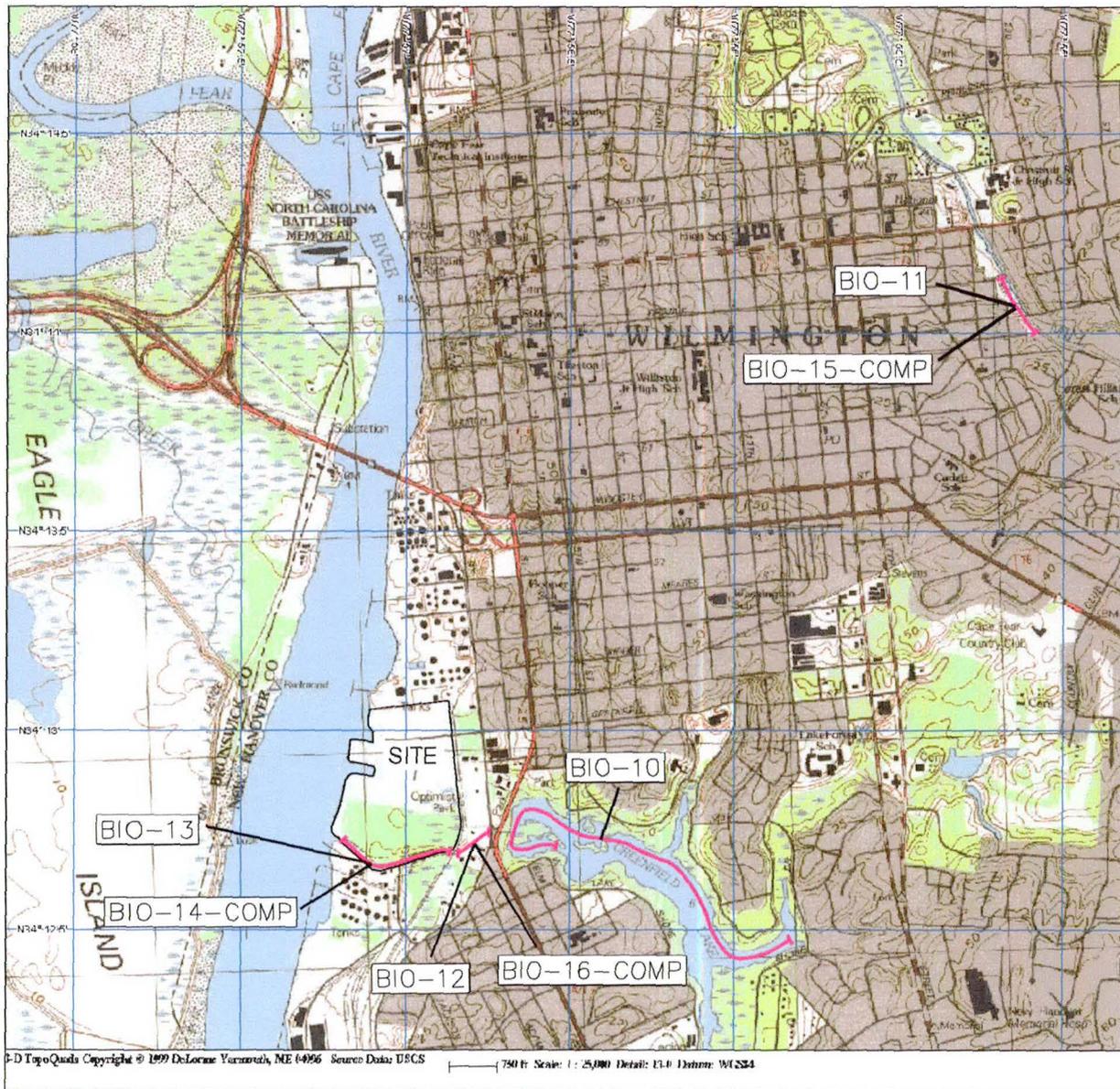
- BIOLOGICAL SAMPLE (7)
- FISH SAMPLES COLLECTED APRIL 2001

REFERENCE: USGS 7.5 MINUTE WILMINGTON, NC QUADRANGLE 1993

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FISH PRELIMINARY
 REMEDIATION GOALS



NOTE: ONLY CONSTITUENTS THAT EXCEED "HUMAN-HEALTH" PRELIMINARY REMEDIATION GOALS ARE SHOWN ON MAP.

Preliminary Remediation Goals			
Dioxins/ Furans	Background RBC	Health Residential RBC	Site Specific Health PRG
2378-TCDD	0.593	0.021	30
12378-PeCDD	0.3	0.042	60
123478-HxCDD	ND	0.21	300
123678-HxCDD	0.297	0.21	300
123789-HxCDD	ND	0.21	300
1234678-HpCDD	3.13	2.1	3,000
OCDD	36.5	21	30,000
2378-TCDF	1.07	0.21	300
12378-PeCDF	0.116	0.42	600
23478-PeCDF	0.307	0.042	60
123478-HxCDF	0.324	0.21	300
123678-HxCDF	0.271	0.21	300
234678-HxCDF	0.408	0.21	300
123789-HxCDF	ND	0.21	300
1234678-HpCDF	1.42	2.1	3,000
1234789-HpCDF	ND	2.1	3,000
OCDF	1.93	21	30,000
2378-TCDD TEQ	-	0.021	30

NOTES:

1. All results are in parts per trillion by USEPA Method 1613.
2. Risk Based Concentration (RBC). RBCs derived from USEPA Region III April 13, 2000 Risk-Based Concentration Table for fish ingestion (54 g/d).
3. Preliminary Remediation Goals (PRGs) are set at the least stringent of the background concentration or the Site-Specific PRG.
4. Toxicity Equivalence Quotient (TEQ).
5. Only detected constituents are listed in the PRG table.

LEGEND

- BIOLOGICAL SAMPLE (7)
- FISH SAMPLES COLLECTED APRIL 2001

REFERENCE: USGS 7.5 MINUTE
WILMINGTON, NC QUADRANGLE 1993



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DIOXINS/FURANS
FISH PRELIMINARY
REMEDATION GOALS
FIGURE 32