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WETLAND DELINEATION REPORT APPROXIMATE 1.6 ACRE PARCEL AREA OF CONCERN 721 CNC CHARLESTON SC

9/1/2004

ENSAFE INC.

WETLAND DELINEATION REPORT

Approximate 1.6-Acre Parcel
Charleston Naval Complex – AOC 721
Charleston, South Carolina

Prepared for:

SOUTHNAVFACENGCOM
2155 Eagle Drive
North Charleston, South Carolina 39418

Prepared by:

313 Wingo Way

Mount Pleasant, South Carolina 29464

September 2004

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1.0 INTRODUCTION

EnSafe Inc. (EnSafe) prepared this report on behalf of the Southern Division (SouthDiv) of the Naval Facilities Engineering Command (NAVFAC) to identify potential waters of the United States at the Charleston Naval Complex (CNC) in Charleston, South Carolina. The focus of this report is an approximate 1.6-acre parcel of the CNC referred to as Area of Concern 721 (AOC 721) (Figure 1-1) AOC 721 is located west of Avenue D and south of Noisette Creek in Charleston, Charleston County, South Carolina - 32° 52.357′ N Latitude, 79° 58.445′ W Longitude (Figure 1-2). The purpose of this wetland delineation is to determine if excavation activities under consideration lie within waters of the United States under the jurisdiction of the United States Army Corps of Engineers (USACE). A site visit was made by Alex Bartos and Gary Benfield of EnSafe on July 8, 2004 to conduct the wetland delineation. On September 1, 2004 Fred Mallet of South Carolina Department of Health and Environmental Control, Division of Ocean Coastal Resource Management, met Mr. Benfield and Chad Tripp and confirmed EnSafe's delineation determination.

The findings of this report are based on information gathered during the site visit, research, and understanding of the USACE 1987 Wetlands Delineation Manual (Y-87-1). This report is subject to jurisdictional determination review by the USACE and OCRM.

1.1 Site Description

AOC 721 is approximately 1.6 acres and is located west of Avenue D North, and just south of Noisette Creek. AOC 721 includes a 650 foot long drainage ditch on the western side and runs northeast along a perimeter road and discharges into Noisette Creek. AOC 721 widens significantly prior to its discharge point into Noisette Creek. According to the Charleston quadrangle USGS 7.5 minute series topographic map, this portion of AOC 721 rises in elevation from 1.5 feet above mean sea level (msl) to 8 feet above msl. AOC 721 is densely vegetated with mostly shrub and herb layer species.

A small pond is located immediately east of the drainage ditch and is encompassed partially by the AOC 721 boundary. During times of heavy rainfall the pond overflows and empties into the drainage ditch. A larger pond is adjacent to AOC 721 to the southeast. Both ponds are a result of coal pile removal actions conducted in 1996 leaving depressions in the topography.

A review of historical aerial photographs indicates the entire area to the east-southeast of AOC 721 was used to store coal (Appendix A – Photographs).

1.2 Project Background

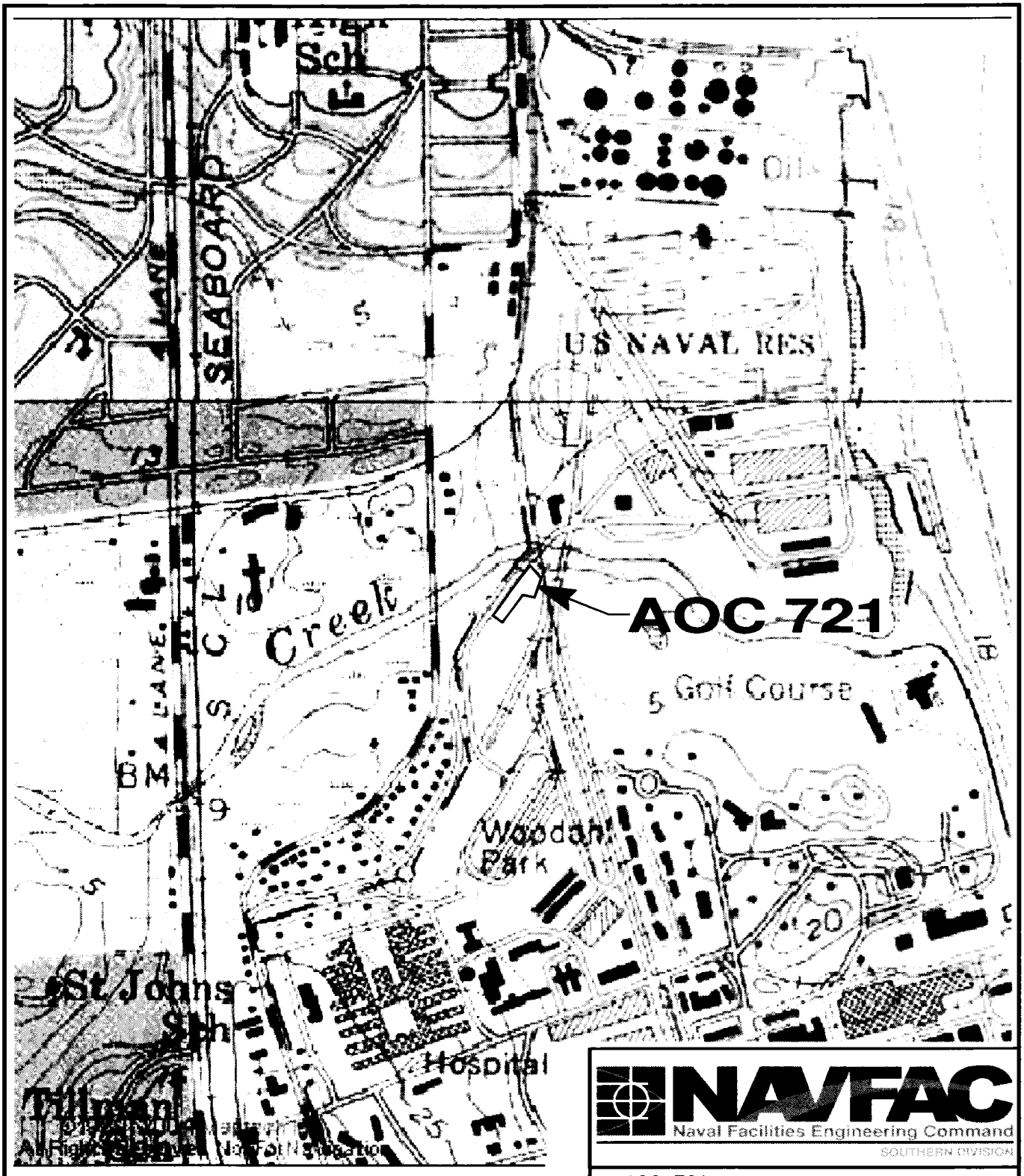
Initial sampling events were conducted between 1981 and 1985 which identified metals and suspended solids in surface water and storm water runoff samples leading to AOC 721. A RCRA Facility Assessment (RFA) to evaluate the coal storage facility was conducted in 1995. Findings of the 1981 and 1985 sampling events and the RFA led to a RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) of Solid Waste Management Unit (SWMU) 44 from 1995 to 2002. The RFI identified COC affected soils in the area now known as AOC 721. The coal pile storage located to east-southeast of AOC 721 acted as a source of contamination to the soil. This pre-existing coal pile and related surface soils were removed in a cleanup effort in 1996. During RFI activities at AOC 721, it was observed that COPCs were present in sediments at levels exceeding risk based screening numbers.

Figure 1-1

AOC 721 Site Features Map

AOC 721
Wetland Delineation Report
Charleston Naval Complex
Charleston, South Carolina

Date: 1/21/04	Drwn by: CT	File: aoc721wetland_delin_report.apr



NAVFAC
Naval Facilities Engineering Command
SOUTHERN DIVISION

AOC 721
WETLAND DELINEATION
REPORT
CHARLESTON NAVAL COMPLEX
CHARLESTON, SC

FIGURE 1-2
TOPOGRAPHIC MAP
AOC 721

Date: 07/23/04 | DWG Name: 0164C013

2.0 METHODOLOGY

Determination and delineation of wetland areas within the project area were based on review of soil, vegetative, and hydrologic data, and a thorough on-site investigation on July 8, 2004. The delineation process used standard methodologies for routine determinations as described in the 1987 Corps Wetland Delineation Manual. Three transects (Transect A, B and C) were made along AOC 721 traversing the length of the AOC 721. Transects were surveyed using a Trimble Pathfinder Pro XRS Differential Global Positioning System (DGPS) Receiver and Data Collector capable of sub-meter accuracy. Coordinates were post-processed to increase accuracy. The critical habitat delineation of wetland boundaries and other water habitat areas are shown on Figure 2-1. The Routine Wetland Determination Data Forms are included in Appendix B.

2.1 Soil Conditions

A United States Department of Agriculture Soil Conservation Service Soil Survey of Charleston County, South Carolina was not readily available during the site visit and was not likely to be accurate for AOC 721. Historical aerial photographs indicate that a majority of this area had been altered with fill material in the 1950s.

Although soils throughout AOC 721 were very similar in low matrix chroma (typically in the 2/1 to 7/1 chroma range), textures varied greatly from silty sands to silty clay. This is largely due to the human alteration and tidal influence in this area. All of the test pits exhibited hydric soil conditions with gleyed and low-chroma colors with some test pits containing contrasting reddish mottles. A mild sulfidic odor was noted in a few test pits (test pits A1, B1, and C1) located in the storm water drainage ditch indicating reducing conditions are present. It should be noted that the presence of fill material is scattered throughout this area.

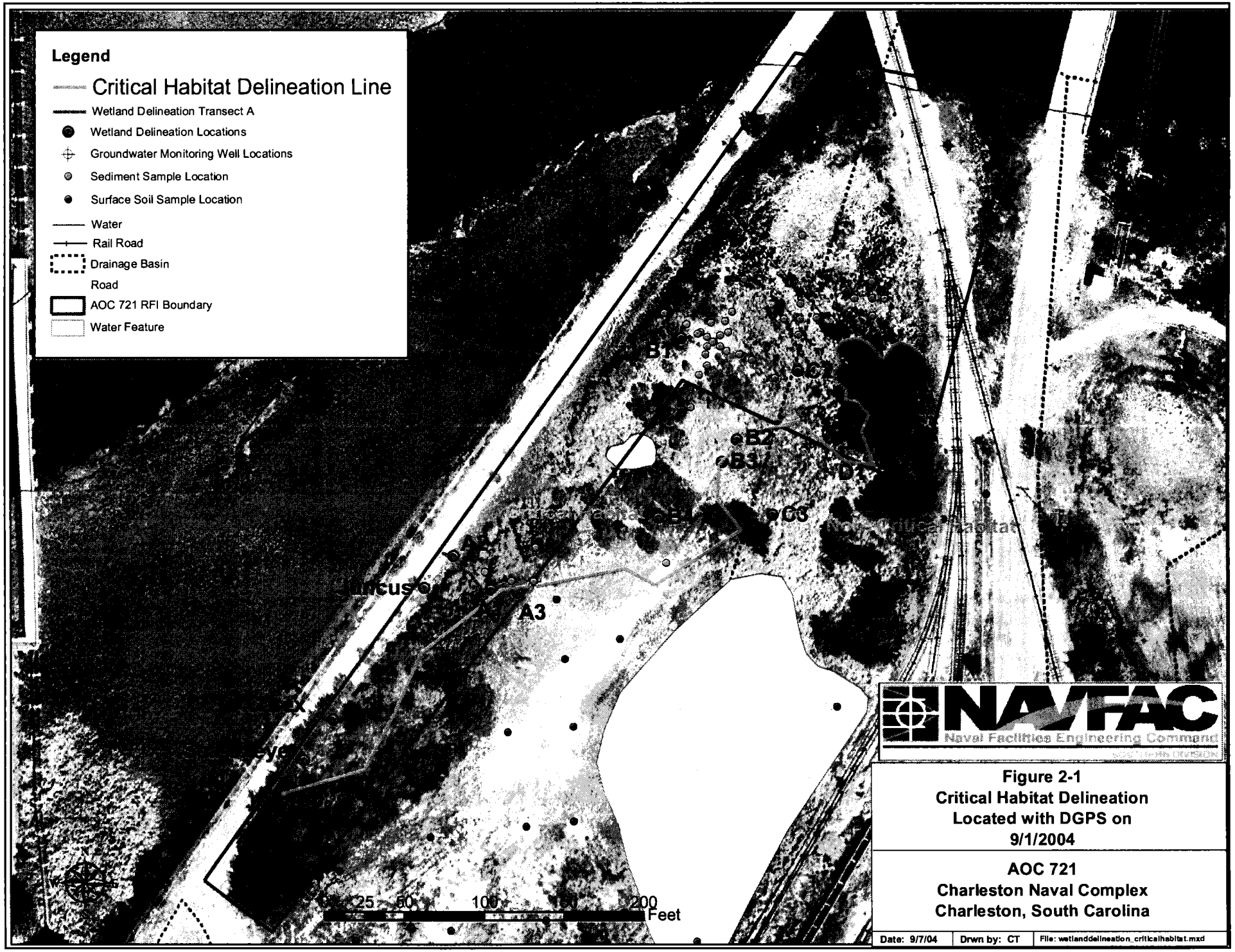


Figure 2-1
Critical Habitat Delineation
Located with DGPS on
9/1/2004

AOC 721
Charleston Naval Complex
Charleston, South Carolina

Date: 9/7/04	Drwn by: CT	File: wetlanddelineation_criticalhabitat.mxd

2.2 Hydrology Conditions

Storm water from AOC 721 and its surroundings are conveyed into the onsite drainage ditch and flow into Noisette Creek contributing to the wetland hydrology. Tidal energy from Charleston Harbor influences the hydrology of Noisette Creek and the drainage ditch in AOC 721. Salinity measurements of water in the drainage ditch were not collected during this site visit, however during the RFI for AOC 721 surface water samples collected at the tide cycles recorded salinity readings of 9.6 and 11.2 grams/liter respectively and the dominance of salt tolerant wetland species near the outlet of the drainage ditch illustrate the tidal influence. Additionally, fiddler crab burrows were noticed in the drainage ditch near the outfall into Noisette Creek and in low-lying adjacent areas in AOC 721. The drainage ditch is bound to the west by a perimeter road. Low lying areas to the adjacent drainage ditch are influenced by retention water and overflow water from the drainage ditch. The remaining areas of AOC 721 that exhibit wetland hydrology are in low lying areas that tend to pond water during times of rainfall and/or high tide.

Wetland hydrology criteria are interspersed in AOC 721 and were not present in several test pit areas. Test pits A2, A3, B4 and D1 were lacking wetland hydrology. Several other areas within AOC 721 were lacking wetland hydrology. The pattern was largely attributable to subtle elevation variances. The wetland hydrology exhibited a mosaic pattern in AOC 721, with approximately 70 percent having wetland hydrology and 30 percent lacking wetland hydrology. The water depth in the drainage ditch ranged from less than 1 inch to approximately 6 inches.

2.3 Vegetative Conditions

A majority of AOC 721 is densely vegetated with a scrub-shrub and herbs. Vegetative communities present within the onsite wetland areas were dominated by scrub-shrub and herb layer species in and around the visibly wet areas including salt marsh bulrush, *Scirpus robustus* (OBL); Black grass, *Juncus gerardii* (OBL); Salt grass, Distichlis spicata (FACW+); Sea ox-eye, *Borrichia frutescens* (OBL); Wax myrtle, *Myrica cerifera* (FAC+); Marsh elder, *Iva frutescens* (FACW+); Laurel oak, *Quercus laurifolia* (FACW); Southern dewberry, *Rubus trivialis* (FAC); Poison ivy, *Toxicodendron radicans* (FAC); Virginia creeper, *Parthenocissus quinjquefolia* (FAC), Sea myrtle, *Baccharis halimifolia* (OBL). Other species were present and recorded on the Routine Wetland Determination Forms in Appendix B.

The dominant species throughout the site were facultative to obligate. Upland species were not found surrounding any of the test pits nor observed in AOC 721. A few salt tolerant species (*Borrichia frutescens, Baccharis halimifolia*) were dominant near the outlet of the drainage ditch into Noisette Creek illustrating the influence on salinity in this portion of AOC 721.

3.0 DELINEATED WETLANDS

A concrete culvert feeds the approximate 650 foot drainage ditch that runs the length of AOC 721 and discharges into Noisette Creek. As the drainage ditch approaches Noisette Creek, AOC 721 widens to the east. The entire length of the drainage ditch exhibits wetland criteria for hydrology, vegetation and hydric soils. As AOC 721 widens, wetland vegetation and hydric soils persist. However, hydrology in the widened area has a mosaic pattern with approximately 70 percent exhibiting wetland hydrology and 30 percent non-wetland hydrology. The portions of this area lacking wetland hydrology are limited to slight rises in the ground surface's elevation. These areas are small enough that separating them out for functional use is not practical and therefore all of the 1.6-acres comprising AOC 721, including areas lacking wetland hydrology, is included as delineated wetlands. The wetland boundaries, as shown in Figure 3, constitute the total area of jurisdictional waters of the U.S. within the AOC 721.

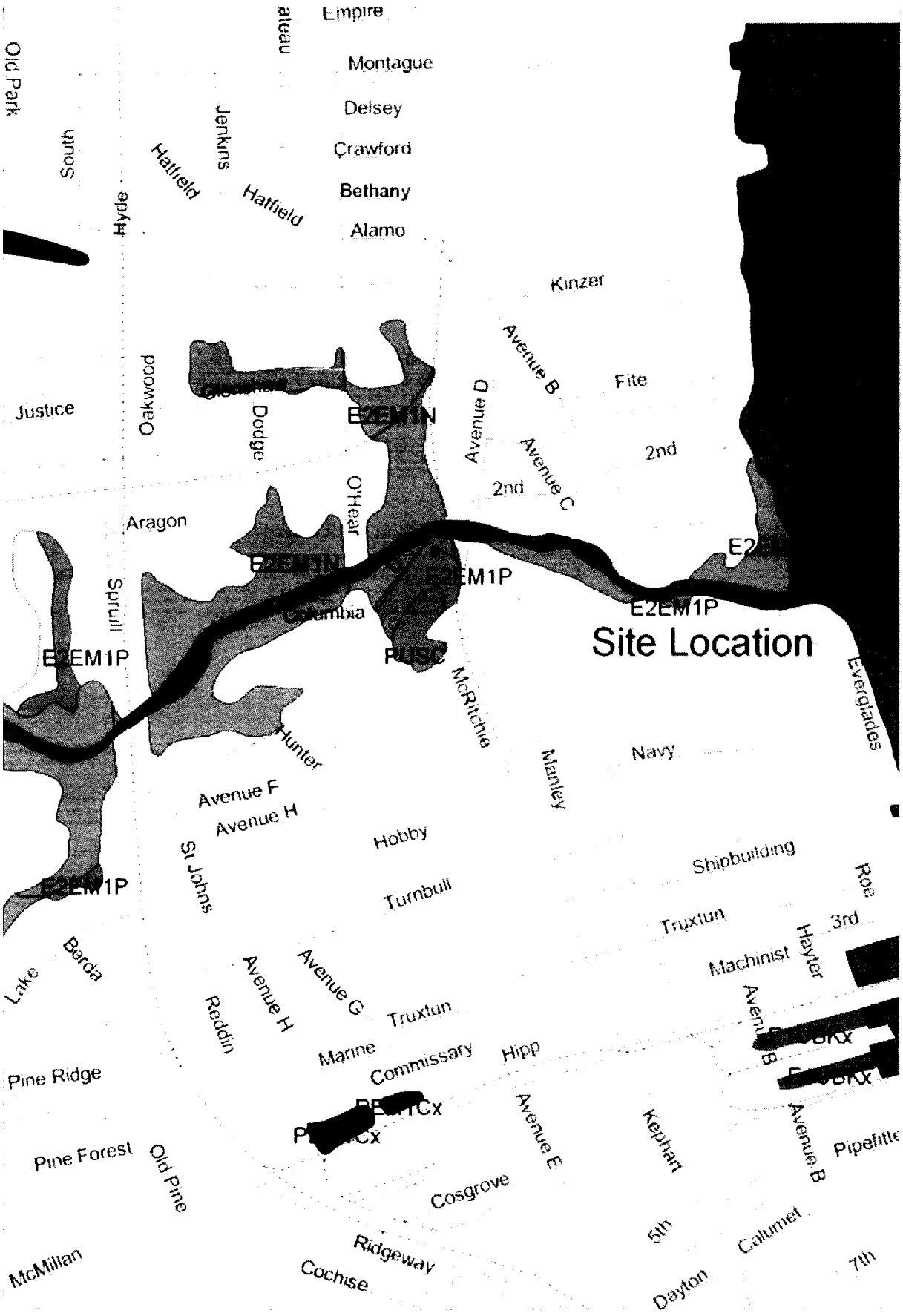
According to the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (Figure 3), AOC 721 lies within an estuarine, intertidal, emergent, persistent, irregularly flooded wetland. The wetland delineation site visit confirmed findings of the USFWS NWI map. AOC 721 lies along Noisette Creek and is irregularly flooded by its tidal waters which flood portions of the drainage ditch less often than daily. Persistent vegetation is found in the area and appears year round throughout AOC 721.

3.1 Functions and Values of Identified Wetlands

Wetland habitats can provide significant functions in their surrounding environment. These functions are typically complex, interrelated, and difficult to assess and quantify. Based on observations, the wetlands in this area likely help abate ocean storms by buffering their energy prior to coming onto the mainland. These wetlands are capable of removing nutrients and sediments that would otherwise flow through the drainage ditch into Noisette Creek. The delineated wetland areas contain moderate quality habitat. Several bird species were noted in the area and Fiddler crabs were observed in and along the drainage ditch as it approached Noisette Creek.

3.2 Critical Habitat Identification

Within the area delineated as jurisdictional wetland, some of these areas also meet the OCRM definition of critical habitat. These areas are characterized by the presence of salt tolerant plant species and fiddler crab burrows. Generally speaking the area identified as critical habitat includes the area between the old frontage road on the east to the row of wax myrtle (*Myrica cerifera)* trees within AOC 721. Critical habitat areas are identified on Figure 2-1. Sample locations previously identified as surface soil locations will now be evaluated as sediment.



AOC 721
Wetland Delineation Report
Charleston Naval Complex
Charleston, South Carolina

Figure 3 - USFWS National Wetland Inventory Map

4.0 Areas Potentially Regulated by the Army Corps Of Engineers

All potential wetland areas addressed in this report are regulated under Section 404 of the Clean Water Act which regulates activities that result in the discharge of dredge or fill materials into waters of the United States. Below are the definitions used to classify onsite aquatic resources.

Definition of Water of the U.S.

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

   i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
   ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   iii) Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under the definition;

5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;

6. The territorial seas;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section; Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.

Definition of a Wetland

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (40 CFR § 230.3(t) and 33 CFR § 328.3(b).)

The areas subject to regulation under these Sections are the west and east lagoon areas as described in Section 3 and outlined on Figure 3.

5.0 REFERENCES

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United States Fish and Wildlife Service. 2004. *Wetlands Mapper Website.* *http://wetlandsfws.er.usgs.gov/wtlnds/viewer.htm*

Attachment A

Site Photographs

Attachment B

Wetland Data Forms

WETLAND DELINEATION REPORT

Conducted on

Charleston Naval Complex - AOC 721
Charleston, South Carolina

Project Code: 0164-001

For

SOUTHNAVFACENGCOM
2155 Eagle Drive
North Charleston, South Carolina

Issue Date: September 2, 2004

Gary Benfield _____ _____
Environmental Scientist Signature

Charlie Vernoy _____ _____
Task Order Manager Signature

Prepared by:

EnSafe Inc.
313 Wingo Way
Mount Pleasant, South Carolina 29464

Photo 7:
Soil profile from test pit B1.

Photo 8:
Borrichia frutescens (Sea Ox-eye) is the dominant vegetation in much of the area delineated as critical habitat.

Photo 5:
Vegetation and conditions at location of test pit B1. This test pit was in the immediate vicinity of the highest arsenic concentrations in AOC 721

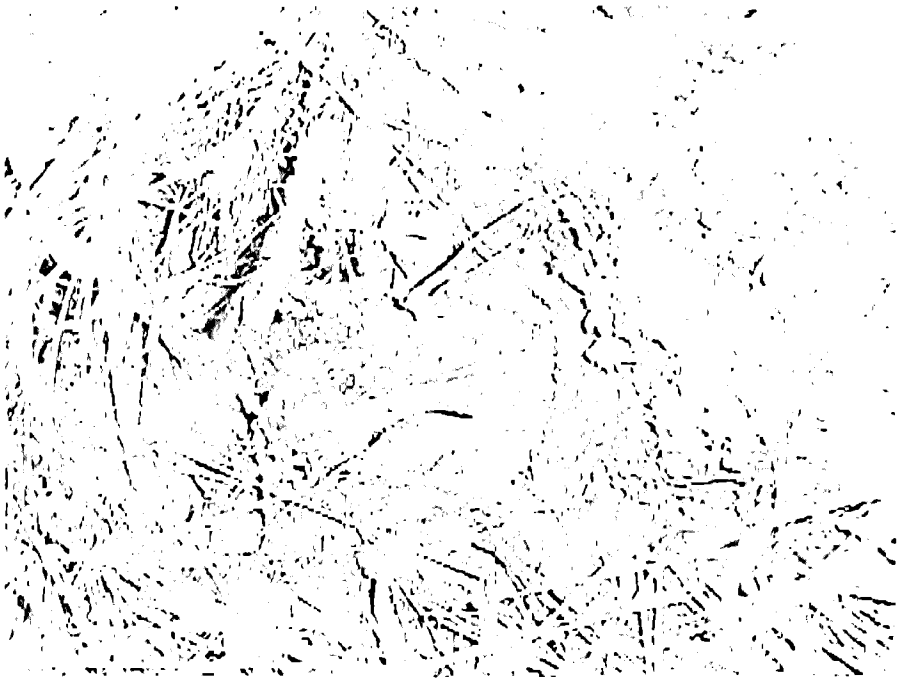


Photo 6:
Test pit B1. Notice standing water at bottom of test pit.

Photo 3:
Soil profile removed from test pit A1.

Photo 4:
Ponded area to the south of test pit B1.

Wetland Report
Photo Log

Photo 1:
Vegetation and conditions at location A1. Test pit was dug here to verify presence of hydric soils.

Photo 2:
Test pit A1. Note standing water in bottom of test pit.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	O	10 YR3/1			Organic sands
2-10	A	10 YR3/1			Silty sand
10-16	B	10 YR 4/1			Silty sand

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
X	Sulfidic Odor	____	Organic Streaking in Sandy Soils
X	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: Light sulfidic odor. NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No		
Wetland Hydrology Present?	**Yes** No		
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: A
Is the area a potential Problem Area?	Yes No	Plot ID: A1
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Scirpus robustus	Herb	OBL			
Juncus gerardi	Herb	OBL			
Borrichia frutescens	Herb	OBL			
Myrica cerifera	Shrub	FAC+			
Iva frutescens	Shrub	FACW+			
Quercus laurifolia	Tree	FACW			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **6/6 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	1	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	0	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- X Inundated
- ___ Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	O	10 YR 2/1			Organic silty clay
2-4	A	7.5 YR 3/1			Silty clay
4-12	B	10 YR 5/1	2.5 YR 3/6	~20%	Silty clay

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
____	Sulfidic Odor	____	Organic Streaking in Sandy Soils
____	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes**	No	
Wetland Hydrology Present?	Yes	**No**	
Hydric Soils Present?	**Yes**	No	Is this Sampling Point within a Wetland? Yes **No**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: A
Is the area a potential Problem Area?	Yes No	Plot ID: A2
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Rubus trivialis.	Herb	FAC			
Parthenocissus quinquefolia	Herb	FAC			
Toxicodendron radicans	Herb	FAC			
Myrica cerifera	Shrub	FAC+			
Quercus laurifolia	Tree	FACW			
Juniperus virginiana	Tree	FAC-			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **5/6 = 83.3%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	none	(in.)
Depth to Free Water in Pit:	none	(in.)
Depth to Saturated Soil:	>18	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Oxidized root channels present at depths greater than 12 inches below ground surface.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	7.5 YR 2.5/1			Organic silty sand
2-16	A	10 YR 3/2			Sandy clay loam

Hydric Soil Indicators:

_____	Histosol	_____	Concretions
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List
_____	Reducing Conditions	_____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	_____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No	
Wetland Hydrology Present?	Yes **No**	
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland? Yes **No**
Remarks:		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: A
Is the area a potential Problem Area?	Yes No	Plot ID: A3
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Toxicodendron radicans	Herb	FAC			
Rubus trivialis	Herb	FAC			
Borrichia frutescens	Herb	OBL			
Parthenocissus quinquefolia	Herb	FAC			
Myrica cerifera	Shrub	FAC+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **5/5 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: B
Is the area a potential Problem Area?	Yes No	Plot ID: B1
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Cyperus filicinus	Shrub	OBL			
Scirpus robustus	Shrub	OBL			
Baccharis halimifolia	Shrub	OBL			
Barrichia frutescens	Shrub	OBL			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **4/4 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	0.5	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	0	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- X Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	5 YR 2.5/1	10 R 4/6	~5%, <2mm	Organic silt
1-8	A	10 YR 3/1	10 R 3/6	~5%, <2mm	Clayey silt
8-10	A	10 YR 4/1	10 R 3/6	~20%, <7mm	Sandy silt
10-14	B	5 YR 6/1	10 R 3/6	~20%, , 7mm	Sandy silt

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
X	Sulfidic Odor	____	Organic Streaking in Sandy Soils
X	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: Low sulfidic odor. NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No		
Wetland Hydrology Present?	**Yes** No		
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: B
Is the area a potential Problem Area?	Yes No	Plot ID: B2
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Cyperus filicinus	Herb	OBL			
Myrica cerifera	Shrub	FAC+			
Baccharis halimifolia	Shrub	FAC			
Barrichia frutescens	Shrub	OBL			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **4/4 = 100%**

Remarks: Passes Fac Neutral test

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: 14 (in.)

Depth to Saturated Soil: 11 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- X Oxidized Root Channels in Upper 12 in.
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	2.5 YR 4/1	10 R 4/6	~5%, <2mm	Organic silty sand
1-12	A	5 YR 7/1			Silty sand

Hydric Soil Indicators:

_____	Histosol	_____	Concretions
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List
_____	Reducing Conditions	_____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	_____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No	
Wetland Hydrology Present?	**Yes** No	
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland? **Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: B
Is the area a potential Problem Area?	Yes No	Plot ID: B3
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Cyperus filicinus	Herb	OBL			
Juncus sp.	Herb	--			
Baccharis halimifolia	Shrub	FAC			
Myrica cerifera	Shrub	FAC+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **3/4 = 75%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	none	(in.)
Depth to Free Water in Pit:	14	(in.)
Depth to Saturated Soil:	11	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	2.5 YR 4/1	10 R 4/6	~5%, <2mm	Organic silty sand
1-14	A	5 YR 7/1			Silty sand

Hydric Soil Indicators:

_____	Histosol	_____	Concretions
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List
_____	Reducing Conditions	_____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	_____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No		
Wetland Hydrology Present?	**Yes** No		
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: B
Is the area a potential Problem Area?	Yes No	Plot ID: B4
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Parthenocissus quinquefolia	Herb	FAC			
Ampelopsis arborea	Herb	FAC+			
Rubus trivialis	Herb	FAC			
Myrica cerifera	Shrub	FAC+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **4/4 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	7.5 YR 2/1			Organic silty sand
1-14	A	5 YR 3/1	2.5 YR 3/6	~40%, <10mm	Silty sand

Hydric Soil Indicators:

_____	Histosol	_____	Concretions
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List
_____	Reducing Conditions	_____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	_____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes**	No	
Wetland Hydrology Present?	Yes	**No**	
Hydric Soils Present?	**Yes**	No	Is this Sampling Point within a Wetland? Yes **No**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: C
Is the area a potential Problem Area?	Yes No	Plot ID: C1
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Scirpus robustus	Herb	OBL			
Juncus gerardi	Herb	OBL			
Borrichia frutescens	Herb	OBL			
Iva frutescens	Shrub	FACW+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **4/4 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	1	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	0	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- X Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	10 YR3/1			Organic sands
1-10	A	10 YR3/1			Silty sand
10-18	B	10 YR 4/1			Silty sand

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
X	Sulfidic Odor	____	Organic Streaking in Sandy Soils
X	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: Light sulfidic odor. NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No	
Wetland Hydrology Present?	**Yes** No	
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland? **Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: C
Is the area a potential Problem Area?	Yes No	Plot ID: C2
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Borrichia frutescens	Herb	OBL			
Toxicodendron radicans	Herb	FAC			
Parthenocissus quinquefolia	Herb	FAC			
Iva frutescens	Shrub	FACW+			
Myrica cerifera	Shrub	FAC+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **5/5 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	none	(in.)
Depth to Free Water in Pit:	11	(in.)
Depth to Saturated Soil:	8	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	7.5 YR 2.5/1			Organic silty loam
1-8	A	10 YR 7/2			Sandy loam
8-14	B	10 YR 7/2	10 YR 7/6	~5%, <5mm	Clayey loam

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
____	Sulfidic Odor	____	Organic Streaking in Sandy Soils
____	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes**	No	
Wetland Hydrology Present?	**Yes**	No	
Hydric Soils Present?	**Yes**	No	Is this Sampling Point within a Wetland? **Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: C
Is the area a potential Problem Area?	Yes No	Plot ID: C3
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Sapium sebiferum	Herb	FAC			
Toxicodendron radicans	Herb	FAC			
Parthenocissus quinquefolia	Herb	FAC			
Iva frutescens	Shrub	FACW+			
Myrica cerifera	Shrub	FAC+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **5/5 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	none	(in.)
Depth to Free Water in Pit:	16	(in.)
Depth to Saturated Soil:	3	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	7.5 YR 2.5/1			Organic silt
1-6*	A	7.5 YR 5/6	N 7/ -	~10%, <7 mm	Sandy loam
6-16	A	N 5/ -			Sandy clay

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
____	Sulfidic Odor	____	Organic Streaking in Sandy Soils
____	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s. 1-6 inch interval 50% matrix, 50% mottled

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No		
Wetland Hydrology Present?	**Yes** No		
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: C
Is the area a potential Problem Area?	Yes No	Plot ID: C3
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Sapium sebiferum	Herb	FAC			
Toxicodendron radicans	Herb	FAC			
Parthenocissus quinquefolia	Herb	FAC			
Iva frutescens	Shrub	FACW+			
Myrica cerifera	Shrub	FAC+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **5/5 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	none	(in.)
Depth to Free Water in Pit:	16	(in.)
Depth to Saturated Soil:	3	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O	7.5 YR 2.5/1			Organic silt
1-6*	A	7.5 YR 5/6	N 7/ -	~10%, <7 mm	Sandy loam
6-16	A	N 5/ -			Sandy clay

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	____	High Organic Content in Surface Layer in Sandy Soils
____	Sulfidic Odor	____	Organic Streaking in Sandy Soils
____	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	____	Other (Explain in Remarks)

Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s. 1-6 inch interval 50% matrix, 50% mottled

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** No		
Wetland Hydrology Present?	**Yes** No		
Hydric Soils Present?	**Yes** No	Is this Sampling Point within a Wetland?	**Yes** No
Remarks:			

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 ACOE Wetlands Delineation Manual)

Project/Site: Area of Concern 721 Date: 7-01-04
Applicant/Owner: Naval Facilities Engineering Command County: Charleston
Investigator: Alex Bartos and Gary Benfield State: South Carolina

Do Normal Circumstances exist on the site?	Yes No	Community ID: N/A
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: D
Is the area a potential Problem Area?	Yes No	Plot ID: D1
(if needed, explain on reverse)		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Ampelopsis arborea	Herb	FAC+			
Rubus trivialis	Herb	FAC			
Parthenocissus quinquefolia	Herb	FAC			
Myrica cerifera	Shrub	FAC+			
Salix babylonica	Tree	FACW			
Sapium sebiferum	Tree	FAC			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) **6/6 = 100%**

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 in.
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent heavy rains.

SOILS

Map Unit Name
(Series and Phase): N/A

Drainage Class N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? N/A

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	O	10 YR 2/1			Organic
2-8	A	10 YR 2/1			Silty loam
8-16	A	2.5 YR 4/1	10 R 4/6	~30%, <10mm	Sandy loam

Hydric Soil Indicators:

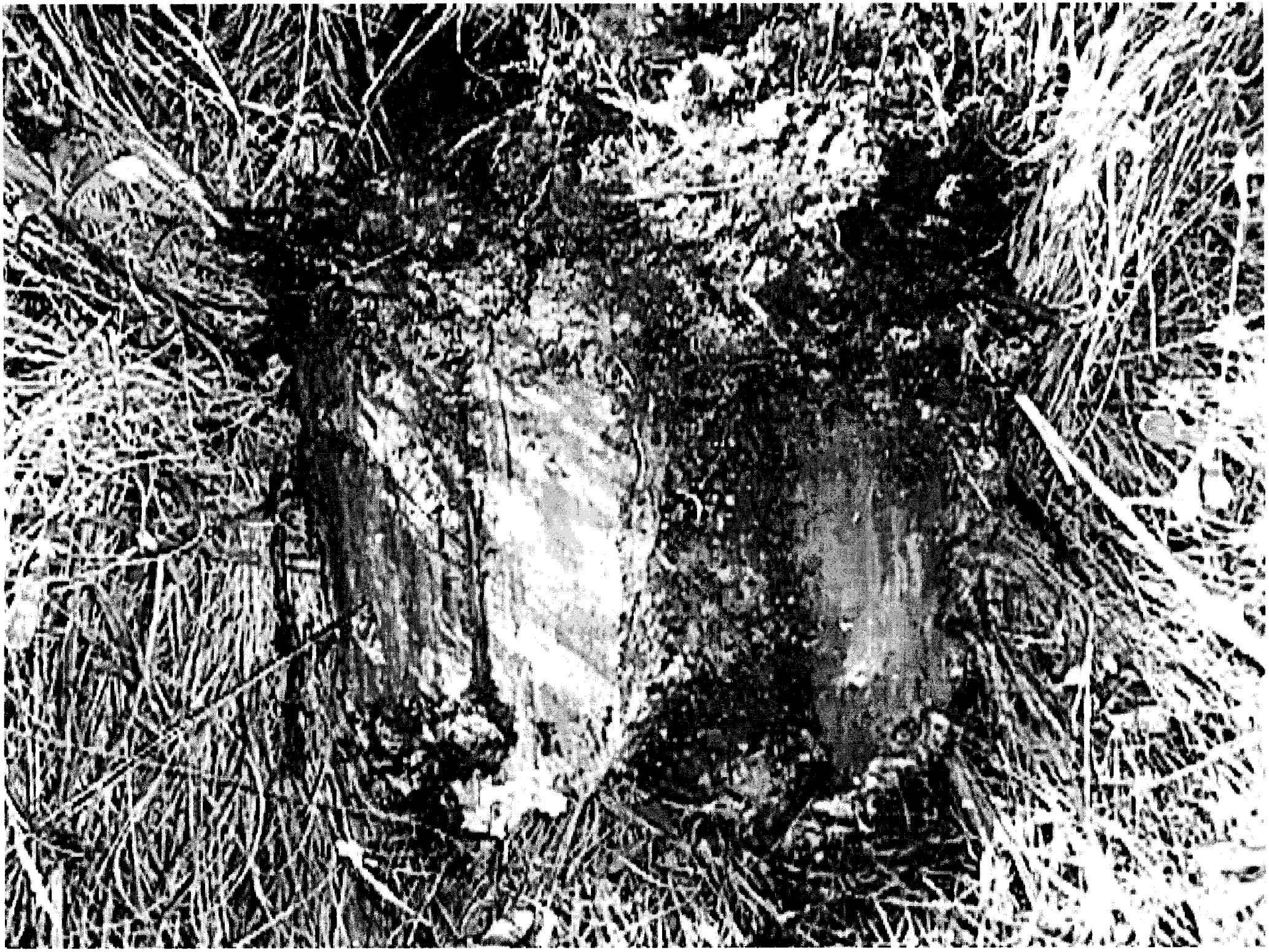
_____	Histosol	_____	Concretions
_____	Histic Epipedon	_____	High Organic Content in Surface Layer in Sandy Soils
_____	Sulfidic Odor	_____	Organic Streaking in Sandy Soils
_____	Aquic Moisture Regime	_____	Listed on Local Hydric Soils List
_____	Reducing Conditions	_____	Listed on National Hydric Soils List
X	Gleyed or Low-chroma Colors	_____	Other (Explain in Remarks)

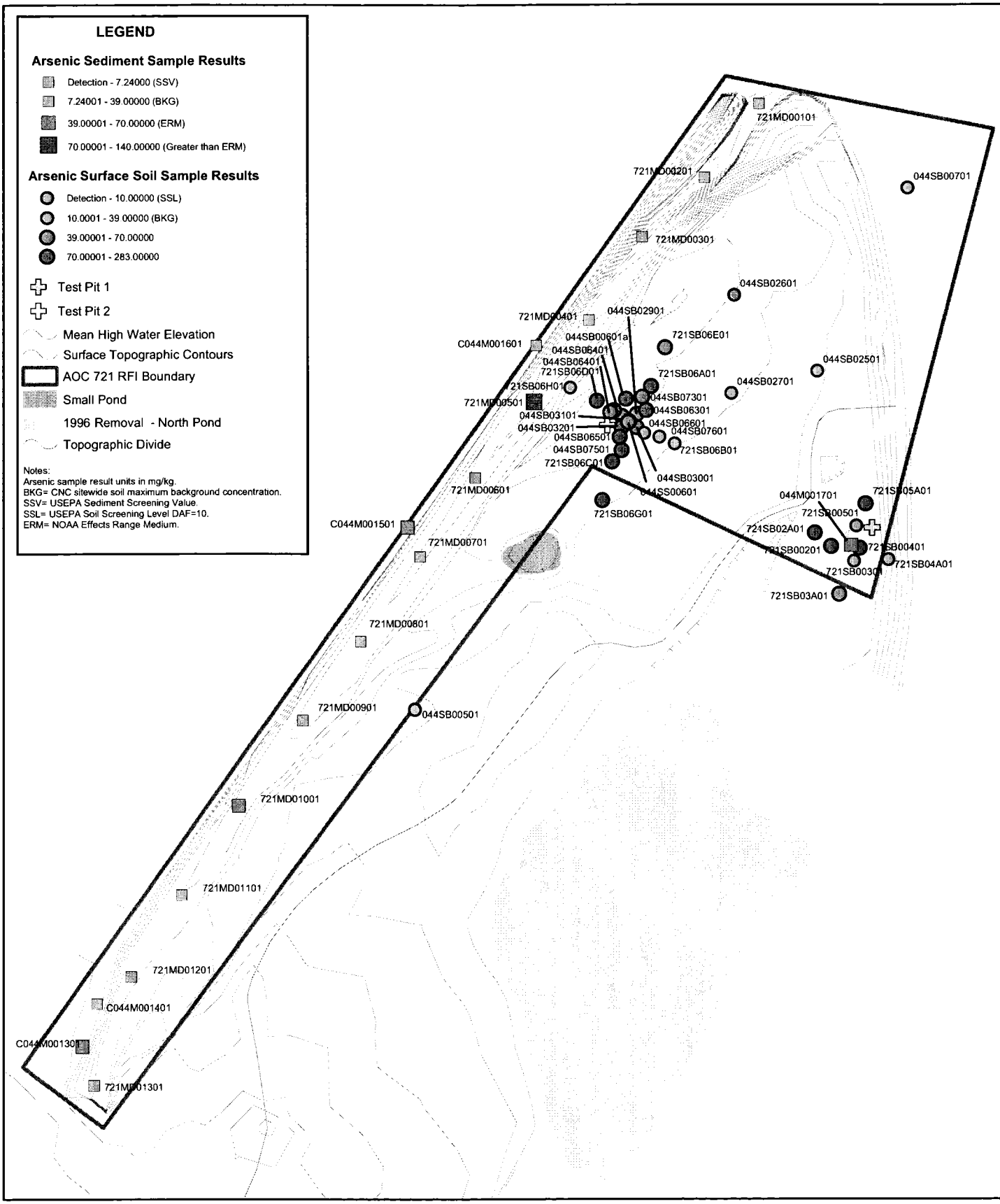
Remarks: NRCS Soil Survey not readily available during site visit and not deemed to be highly accurate because historical aerial photographs indicate a majority of this area had been altered with fill material in the 1950s.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes**	No	
Wetland Hydrology Present?	Yes	**No**	
Hydric Soils Present?	**Yes**	No	Is this Sampling Point within a Wetland? Yes **No**

Remarks:




LEGEND
Arsenic Sediment Sample Results
Detection - 7.24000 (SSV)
7.24001 - 39.00000 (BKG)
39.00001 - 70.00000 (ERM)
70.00001 - 140.00000 (Greater than ERM)
Arsenic Surface Soil Sample Results
Detection - 10.00000 (SSL)
10.0001 - 39.00000 (BKG)
39.00001 - 70.00000
70.00001 - 283.00000
Test Pit 1
Test Pit 2
Mean High Water Elevation
Surface Topographic Contours
AOC 721 RFI Boundary
Small Pond
1996 Removal - North Pond
Topographic Divide
Notes:
Arsenic sample result units in mg/kg.
BKG= CNC sitewide soil maximum background concentration.
SSV= USEPA Sediment Screening Value.
SSL= USEPA Soil Screening Level DAF=10.
ERM= NOAA Effects Range Medium.
721MD00101
721MD00201
044SB00701
721MD00301
044SB02601
721MD00401
044SB02901
C044M001601
044SB00601a
721SB06E01
044SB06401
044SB06401
721SB06D01
721SB06A01
044SB02501
721SB06H01
044SB02701
721MD00501
044SB07301
044SB03101
044SB06301
044SB03201
044SB06601
044SB06501
044SB07601
044SB07501
721SB06B01
721SB06C01
044SB03001
721MD00601
044SS00601
721SB06G01
044M001701
721SB05A01
721SB00501
C044M001501
721SB02A01
721MD00701
721SB00201
721SB00401
721SB04A01
721SB00301
721SB03A01
721MD00801
721MD00901
044SB00501
721MD01001
721MD01101
721MD01201
C044M001401
C044M001301
721MD01301
N
W
E
S
NAVFAC
Naval Facilities Engineering Command
0 15 30 60 90 120
Feet
AOC 721
RCRA Facility Investigation Report
Charleston Naval Complex
Charleston, South Carolina
Figure A
Sediment and Surface Water Sample
Arsenic ERM Exceedances
Date: 1/23/04
Drwn by: CT
File: sd-ss-arsenic.mxd

AOC 721 - Wetland Assessment

On December 8, 2003, EnSafe wetland scientists Gary Benfield and Jay Cornelius visited Area of Concern (AOC) 721 in Zone C at the Charleston Naval Complex to determine the extent of wetlands at the site. During the site visit, soil across the majority of the site was visibly saturated and water was standing in many areas. Based on the findings at the site it was determined that the source for the water was from two primary sources: (1) groundwater was visible seeping into the test pits at about 12 inches below land surface and (2) the cattail pond currently drains to the north – northwest across AOC 721 toward Noisette Creek. The wetland determinations included in this report were made following methods laid out in the US Army Corps of Engineers Wetlands Delineation Manual (ACOE 1987).

Approximately six test pits (including two in the area of the highest surface soil contamination) across the site confirmed the presence of both hydric soil and wetland hydrology. The upper horizon (0 to 6 inches) was highly organic, with heavy iron staining in the deeper zone (16 to 18 inches). Subsurface soils in areas along the eastern portion of the site, near the railroad, were light tan sand with iron staining and were quickly inundated with several inches of water seeping in from the sides. Subsurface soil in the central portions of the site was a mottled black and gray sandy clay and also were inundated, but to a lesser degree due to the clayey soil. Photographs of two test pits collected in the two areas of concern (areas with highest sample density) are included in the photo log attached to this report.

The test pits dug across the site were primarily located above the mean high tide mark as indicated in the figures of the AOC 721 Work Plan (EnSafe 2003). The area around test pit 1 was certainly a predominantly fresh water wetland with little influence from tides from Zone J water bodies. Based on the hydrology, soil type, and vegetation observed at the AOC, EnSafe concluded that wetlands are present across the entire site and prior to activities which may impact or disturb these wetlands, a permit would be required, regardless of the wetland origins (manmade vs. naturally occurring). Special controls would also be necessary to prevent impact to the adjacent Noisette Creek.

Having manmade hydrologic barriers (the abandoned road and railway) to the east and west, surface water flowing across the site is essentially funneled across the site and discharges to Noisette Creek. In addition to tidal inundation from Noisette Creek, the site also appears to receive input from the large wetland immediately to the southeast, keeping the site inundated long enough to establish wetlands.

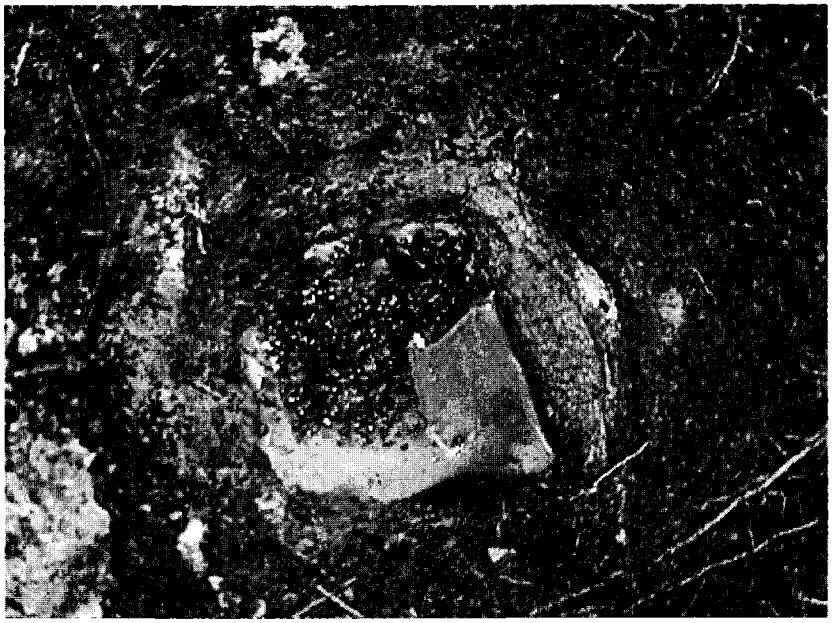
If any excavation of contaminated media is intended, it may be possible for such activity to be permitted under the Clean Water Act's nationwide permit program, specifically. *Nationwide Permit 38 - Cleanup of Hazardous and Toxic Waste*. This permit requires only that the applicant properly notify the Corps of Engineers and the impacted wetlands are delineated.

PHOTO LOG

Photographs taken during Wetland Identification

AOC 721
December 8, 2003

PHOTO NO. 1:



Test pit #1, dug in the south west corner of AOC 721. Water that seeped into the whole from the side walls of the pit can be seen in the bottom of the whole. GPS coordinates for test pit is: N 32 □ 52.338', W 079° 58.419' at an altitude of 49 feet above mean sea level.

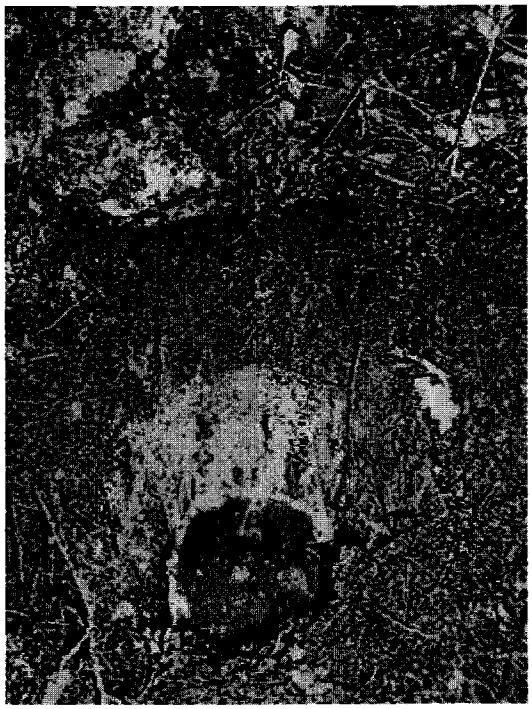
PHOTO NO. 2:

Soil profile from Test pit #1, notice grey soil color and mottled appearance of soils.

PHOTO NO. 3

Vegetation around test pit #1 is a dense thicket dominated by *Myrica cerifera* (wax myrtle).

PHOTO NO. 4



Test pit 2 dug in the south east corner of AOC 721. Water can be seen in the bottom of the whole that seeped from the side walls of the test pit. GPS location for this test pit is

N 32 □52.337' , W079 □ 58.435' at an altitude of 34 feet above mean sea level.

PHOTO NO. 5

Soil profile from test pit # 2. Soil was saturated at surface in area dominated by a grass species.

PHOTO NO. 6

Grassy vegetation located in area where test pit 2 was dug.

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December 16, 2003

Mr. Rob Harrell
SOUTHNAVFACENGCOM
PO POX 190010
NORTH CHARLESTON SC 29419-9010

RE: AOC 721 - Wetland Assessment

Dear Rob:

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Sincerely,

Charlie Vernoy

Charlie Vernoy
Task Order Manager
EnSafe Inc.

ENSAFE