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CORRECTIVE ACTION PLAN FOR HOBSON FUEL FARM ZONE G AREA 20 SITE  
IDENTIFICATION NUMBER 01190 WITH TRANSMITTAL CNC CHARLESTON SC

5/1/2001

J A JONES ENVIRONMENTAL SERVICES

**CORRECTIVE ACTION PLAN  
FOR  
HOBSON FUEL FARM  
ZONE G/ AREA 20**

SITE IDENTIFICATION # 01190

**Charleston Naval Complex**  
Charleston, South Carolina

**SOUTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND**

Contract Number N62467-99-C-0960

May 2001



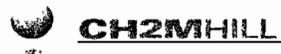
**CORRECTIVE ACTION PLAN  
FOR  
HOBSON FUEL FARM  
ZONE G/ AREA 20**

**SITE IDENTIFICATION # 01190**

**Charleston Naval Complex  
Charleston, South Carolina**

**Submitted to:  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
Charleston, South Carolina 29406**

**Submitted by:  
CH2M-JONES, LLC.  
115 Perimeter Center Place NE  
Suite 700  
Atlanta, Georgia 30346-1278**



**Contract Number: N62467-99-C-0960**

**May 2001**

# CERTIFICATION

I certify that the information contained in this report, is true, and complete to the best of my knowledge, information, and belief.

Approved By: Richard Garcia Date: 5/21/01

South Carolina Registration No. 14220



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**7.0**

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FIG 1.....SITE LOCATION MAPS

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FIG 4.....MONITORING WELL LOCATIONS

FIG 5.....MONITORING WELL LOCATIONS

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## ACRONYMS

bls	below land surface
CAP	Corrective Action Plan
CAR	Contamination Assessment Report
CNC	Charleston Naval Complex
COC	Chemical of Concern
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
EPA	Environmental Protection Agency
FDS	Fuel Distribution System
mg/kg	microgram per kilogram
mg/L	microgram per liter
OVA	Organic Vapor Analyzer
QA	Quality Assurance
QC	Quality Control
RBSL	Risk-Based Screening Level
RDA	Redevelopment Authority
SCDHEC	South Carolina Department of Health and Environmental Control
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SSTL	Site-Specific Target Level
TTNUS	Tetra Tech NUS
UST	Underground Storage Tank

## **1.0 INTRODUCTION**

This Corrective Action Plan (CAP) has been prepared by CH2M-JONES, LLC. The plan is designed for Zone G/ Area 20 of the Hobson Fuel Farm; located at the Charleston Naval Complex (CNC), Charleston, South Carolina.

The South Carolina Department of Health and Environmental Control (SCDHEC) has designated this site as Identification Number: 01190. This CAP provides methods to further evaluate the applicability of active remediation by removing contaminated soils around Area 20, and continuing intrinsic remediation and monitoring well abandonment as a corrective action in accordance with SCDHEC Corrective Action Guidance, June 1997.

### **1.1 General Site Description**

The CNC is located in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina as shown in Figure 1. This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. The site is located within the developed portion of the base as shown in Figure 1.

The area surrounding CNC is “mature urban”, having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, current utilities, and vicinity surface drainage, is included as Figure 2.

Ensafe Inc. completed a Contamination Assessment Report (CAR) for Area 20 on March 6, 2001. The CAR describes Area 20 as being located in the southwest corner of the Hobson Fuel Farm. The CAR describes the numerous petroleum product spills that have occurred at Area 20 over time. For more information on Area 20 in the Hobson Fuel Farm, see Section 4.0 of the CAR completed by Ensafe in March 2001.

### **1.2 Objective**

This CAP addresses two locations within the Area 20 footprint. At the first location, CH2M-Jones, LLC presents a plan to excavate soils in the vicinity of F20SP01404, F20SP02307, and F20SP02407 (Figure 4). Once soil excavation activities have been completed, the monitoring plan in Section 3.0 and 4.0 of this plan will be implemented in order to demonstrate the natural attenuation of groundwater contamination in this area. At the second location, CH2M-Jones, LLC recommends that groundwater be monitored in the vicinity of F20SP01709 and F20SP01906 (Figure 5).

## **2.0 PROPOSED CORRECTIVE ACTION**

Based on the discussion of the CAR, a dig and haul approach will be performed at this site to remove the contaminated soils in the vicinity of F20SP01404, F20SP02307, and F20SP02407. In DPT samples collected for the CAR, levels of Naphthalene exceeded the Risk Based Screening Levels (RBSLs) for subsurface soils (Figure 4-6 of the CAR). The SCDHEC letter dated April 2, 2001 concurs with the recommendations in the CAR that contaminated soils should be excavated to eliminate the source area (Attachment A).

Additional soil samples will be collected prior to excavation in order to establish the contaminated areas. After defining the clean boundaries, soils from approximately 2 to 6 ft bls (or just above groundwater) will be excavated as recommended in the Ensafe CAR. It is possible that the planned construction activities may require excavation in certain areas. In the event that this work presents the possibility of disturbing contaminated soils in the area, the United States Navy (Southern Division Engineering Command) will notify SCDHEC prior to the commencement of the activities. The proposed active measures and monitoring program is described in detail in Sections 3.0 and 4.0 of this plan.

### **3.0 MONITORING WELL INSTALLATION AND ABANDONMENT**

#### **3.1 Monitoring Well Installation**

No monitoring wells will be installed as a part of this plan. Existing monitoring wells will be used for monitoring the groundwater after excavation.

#### **3.2 Monitoring Well Abandonment**

No monitoring wells will be abandoned at this time. The monitoring wells will only be abandoned upon receiving approval for no further action. All monitoring wells will be abandoned following the South Carolina Well Standards and Regulations R.61-71. The well abandonment will include grouting wells, removing stick-ups and removing all guard posts. Any well casing and screen removed will be decontaminated and disposed of as general refuse.

#### **3.3 Surveying**

All soil borings and monitoring wells installed at this site will be surveyed and implemented as a part of the closure report.

#### **3.4 Equipment Decontamination**

All drilling equipment, augers, well casing and screens, and soil and groundwater sampling equipment involved in field sampling activities will be decontaminated according to the Environmental Protection Agencies (EPA) "Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM).

## 4.0 PROPOSED SAMPLING PROGRAM

### 4.1 Soil Boring Schedule

Soil borings will be used in effort to define the boundaries of the excavation area. The analytical data acquired by Ensafe for DPT soil borings, F20SP02407, F20SP02307, and F20SP01404 as shown in Figure 4-6 of the CAR, will be used in order to determine the source of the contaminate. Additional soil borings will be collected to further delineate the area (see Figure 6 for proposed boring locations).

Initially, soil borings will be collected from two intervals prior to any excavation. The first interval will be from 0-2 feet bls and the second interval will be collected from 3-5 feet bls. In the event that groundwater is greater than 5 feet bls, a third interval will be collected. The soil samples will be collected using hand-auguring methods. The intent of the soil samples will be to establish the extent of the contaminated areas. The total number of soil borings will be determined in the field. In the event that the first round of soil boring analytical data are above the RBSLs, additional soil boring samples will be acquired approximately five feet beyond the first set of borings. This process will be used until soil borings with analytical data indicating no contamination are found.

Sampling date	Soil Borings Sampled	Laboratory Analytical
Initial sampling event prior to removal of soil	Number of soil borings to be determined in the field	BTEX and Naphthalene 8260 PAHs 8270

### 4.2 Groundwater Sampling

Following excavation, the existing monitoring wells will be used to support natural attenuation. CH2M-Jones, LLC recommends three rounds of sampling in three-month intervals. If the groundwater analytical results indicate that there are levels of contaminants above the RBSLs, active remediation for the groundwater may be recommended. If the analytical results indicate that there are no contaminants at the site, No Further Action may be recommended for Area 20.

#### Schedule:

1. Establish the contaminated soil areas by sampling soil borings around F20SP02307, F20SP02407, and F20SP01404.
2. Further delineate if first round soil borings did not find the exterior boundaries.
3. Excavate contaminated soil to a depth of approximately 6 ft bls or just above groundwater.
4. Transport contaminated soil to a permitted Treated Storage Disposal Facility that will accept the soils.

5. Backfill excavated area with clean fill dirt.
6. Start monitoring groundwater for natural attenuation.

- **Groundwater Sampling**

No Groundwater sampling proposed until excavation is complete. Once excavation is complete, existing monitoring wells FDSGW20C, FDSGW20F, FDSGW20E, and FDSGW20A will be monitored for natural attenuation.

Prior to any groundwater sampling, each well will be measured for water levels and total depth and each well will be purged in accordance the EPA EISOPQAM.

### **4.3 Analytical Parameters**

The following constituents will be analyzed for each soil sample prior to any excavation:

- BTEX and Naphthalene using method 8260.
- PAHs using method 8270.

The following constituents will be analyzed for each monitoring well.

- BTEX and Naphthalene using method 8260.
- PAHs using method 8270.

The following parameters may be analyzed in order to evaluate the effectiveness of intrinsic remediation for groundwater:

pH, Nitrate/Sulfate, Dissolved Iron, Total Iron, and Alkalinity

### **4.4 Field Measurements**

The following parameters will be sampled in the field for groundwater:

Dissolved Oxygen, pH, Turbidity, Conductivity, Temperature and Oxygen Reduction Potential

### **4.5 Groundwater Level Measurements**

Depth to product (if any), Depth to water, and Total depth of well.

## 4.6 Sample Handling

Sample handling will be conducted in accordance the following references:

EPA EISOPQAM (EPA May, 1996)

Comprehensive Sampling and Analysis Plan, RCRA Facility Investigation, June 30, 1996.

## 4.7 Sample Packing and Shipping

The following forms will be completed to complete the packing/shipping process:

- Sample labels
- Chain-of-custody labels
- Appropriate labels applied to shipping coolers
- Chain-of-custody forms
- Federal express air bill

## 4.8 Quality Control

Quality Control (QC) samples will be collected during sampling events. QC samples may include field blanks, field duplicates, and trip blanks. Definitions of each can be found below as described by the EISOPQAM:

- **Field Blank:** a sample collected using organic-free water, which has been run over/through sample collection equipment. These samples are used to determine if contaminants have been introduced by contact of the sample medium with sampling equipment. Equipment field blanks are often associated with collecting rinse blanks of equipment that has been field cleaned.
- **Field Duplicates:** Two or more samples collected from a common source. The purpose of a duplicate sample is to estimate the variability of a given characteristic or contamination associated with a population.
- **Trip Blank:** A sample, which is prepared prior to the sampling event in the actual container and is stored with the investigative samples throughout the sampling event. They are often packaged for shipment with the other samples and submitted for analysis. At no time after their preparation are trip blanks to be opened before they reach the laboratory. Trip blanks are used to determine if samples were contaminated during storage and/or transportation back to the laboratory (a measure of sample handling variability resulting in positive bias in contaminant concentration). If samples are to be shipped, trip blanks are to be provided with each shipment but not for each cooler.

#### 4.9 Field QA/QC

More information on field QC can be found in section 5.6.

#### 4.10 Control Limits

Analysis	Control Parameter	Control Limit	Corrective Action
Air Monitoring	Check Calibration of OVA daily	Calibrate to manufactures specifications	Recalibrate. If unable to calibrate, replace.
pH of water	Continuing calibration check of pH 7.0 buffer	pH= 7.0	Recalibrate. If unable to calibrate, replace electrode.
Specific Conductance of water	Continuing calibration check of standard solution	> 1% of standard	Recalibrate.

#### 4.11 Record keeping

In addition to records kept in logbooks, forms will be kept on log sheets for soil and groundwater.

#### 4.12 Site Management and Base Support

Throughout the investigation activities, work on the CNC will be coordinated through SOUTHDIV and SCDHEC.

The primary contacts for each are as follows:

1. SOUTHDIV point of contact  
Gabe Magwood  
Southern Division Engineering Command  
2155 Eagle Drive  
North Charleston, SC 29406  
(843) 820-7307
2. SOUTHDIV point of contact  
Tony Hunt  
Southern Division Engineering Command  
2155 Eagle Drive  
North Charleston, SC 29406  
(843) 820-7307

3. SCDHEC point of contact

Michael Bishop

South Carolina Department of Health and Environmental Control

2600 Bull Street

Columbia, SC 29201

(843) 898-4300

## REFERENCES

South Carolina Department of Health and Environmental Control. 1997. Corrective Action Guidance.

Ensaf, Inc.; 2001 Contamination Assessment Report Addendum, Charleston, South Carolina.

United States Environmental Protection Agency. 1990. Code of Federal Regulations 136.

United States Environmental Protection Agency. 1988. EPA Users Guide to Contract Laboratory Program.

United States Environmental Protection Agency. 1996. EPA Environmental Investigations Standard Operating Procedures for Quality Assurance Manual.



2 April 2001

2600 Bull Street  
Columbia, SC 29201-1708

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

RE: CNB - Zone G - Areas 19, 20 & 21 (Hobson Fuel Farm Area)  
Site Identification #'s 01189, 01190 & 01700  
Contaminant Assessment Report Addendum received 19 March 2001  
Charleston County

Dear Mr. Magwood:

The Department has completed technical review of the referenced document. Based on the review the following comments are offered:

#### AREA 19

Per the referenced report, levels of Benzene, Ethylbenzene and Naphthalenes exceeded Risk-Based Screening Levels (RBSLs) for subsurface soils in the vicinity of Building 98 / Tank 148. Groundwater samples also exceeded RBSLs for contaminants of concern (CoCs).

The Department concurs with the recommendation that contaminated soils be excavated to eliminate the source area. However, present groundwater contamination levels indicate that active remediation of groundwater may be required in order to reduce overall groundwater contamination levels. The Department will allow for soils to be excavated immediately, followed by the installation of permanent monitoring wells to evaluate any requirements for groundwater remediation.

#### AREA 20

Per the referenced report, levels of Benzene and Naphthalenes exceeded Risk-Based Screening Levels (RBSLs) for subsurface soils in Area 20. Groundwater samples exceeded RBSLs for SVOCs during DPT investigations; however, groundwater samples extracted from the permanent monitoring wells did not detect any CoCs above the RBSL limits.

Soil contamination discovered in the vicinity of F20SP01404, F20SP02307 and F20SP02407 should be removed as part of corrective action activities in this area. Soil contamination in the vicinity of F20SP01709 and F20SP01906 may require removal in conjunction with proposed construction activities.

The Department concurs with the recommendation that groundwater be monitored to evaluate natural attenuation as the corrective action alternative at this site. Once soil excavation activities have been completed, a monitoring plan should be submitted in order to demonstrate the natural attenuation of groundwater contamination in this area.

SOUTHERN DIVISION NAVAL FEC  
GABRIEL MAGWOOD  
PAGE 2

**AREA 21**

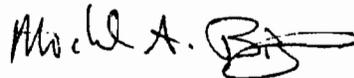
Per the referenced report, levels of SVOCs exceed the RBSL limits for soils. No VOCs were detected above the RBSL limits. Surface soil samples from HFFSP004, HFFSP006 and HFFSP007 exceed RBSL limits for dermal contact. The subsurface sample from HFFSP00802 exhibited levels of Naphthalene above the RBSL limit. Groundwater samples did not exceed the RBSL limits for any petroleum related compounds.

Per the report, Area 21 lies within the foundation area for the proposed warehouse. As a result, any construction activities at this location will be required to mitigate concerns associated with the contaminated surface soils. Any future groundwater concerns can be monitored through the existing monitoring wells at Areas 8 and 20.

Please submit a Corrective Action Plan to the Department outlining the proposed implementation of the corrective action activities discussed above. In addition, please provide the Department with specific information and schedules concerning proposed development activities when this information becomes available. The corrective action plan should be received no later than 8 June 2001.

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

Sincerely,

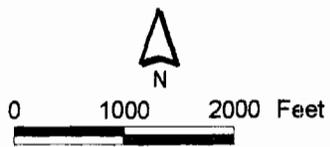


Michael A. Bishop, Hydrogeologist  
Groundwater Quality Section  
Bureau of Water

cc: Trident District EQC  
Mihir Mehta, SCHDEC-BLWM  
Steve Parker, EnSafe, 313 Wingo Way, Mt. Pleasant, SC 29464  
Brian Crawford, Charleston Naval Complex, 1848 Ave. F, North Charleston, SC 29405  
Keith Collinsworth, EQC Admin  
Technical File

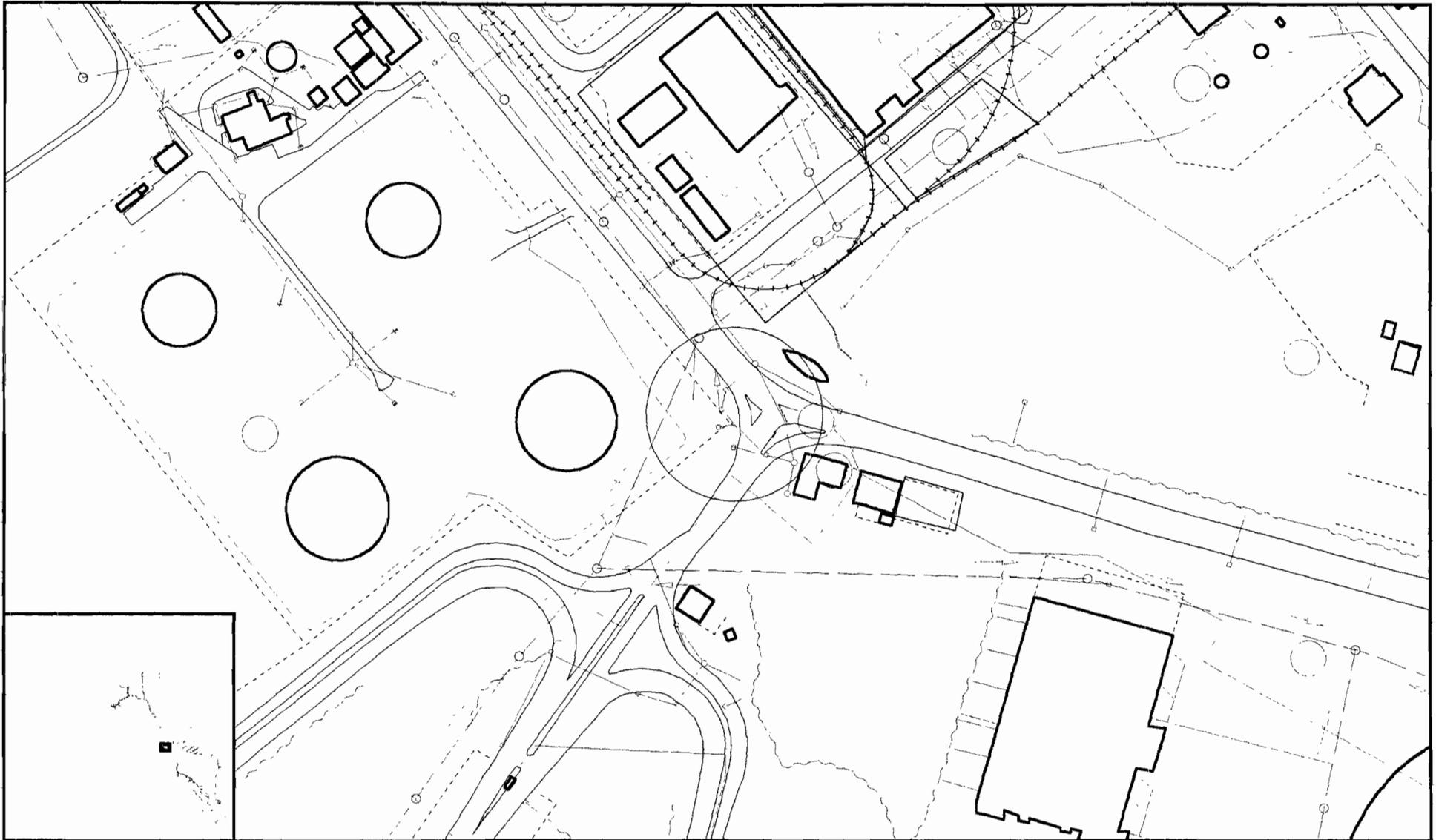


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|---|------------------|---|---------------|
| ∩ | Fence            | □ | AOC Boundary  |
| ∩ | Railroads        | □ | SWMU Boundary |
| ∩ | Roads - Lines    | □ | Buildings     |
| ∩ | Bridges          | □ | Zone Boundary |
| ∩ | Surrounding Area |   |               |
| ∩ | Shoreline        |   |               |



**Figure 1**  
 Site Location Map  
 Area 20  
 Charleston Naval Complex

**CH2MHILL**



- |                     |                          |
|---------------------|--------------------------|
| ∩∩ Fence            | DRAIN-BASIN              |
| ∩∩ Railroads        | ∩∩ DRAIN-LINE            |
| ∩∩ Roads - Lines    | ∩∩ SEWER-LINE/MANHOLE-NS |
| ∩∩ Bridges          | ∩∩ SEWER-LINE/MANHOLE    |
| ∩∩ Surrounding Area | ∩∩ SEWER-FLOW-ARROW      |
| ∩∩ DRAIN-LABEL      | ∩∩ Shoreline             |

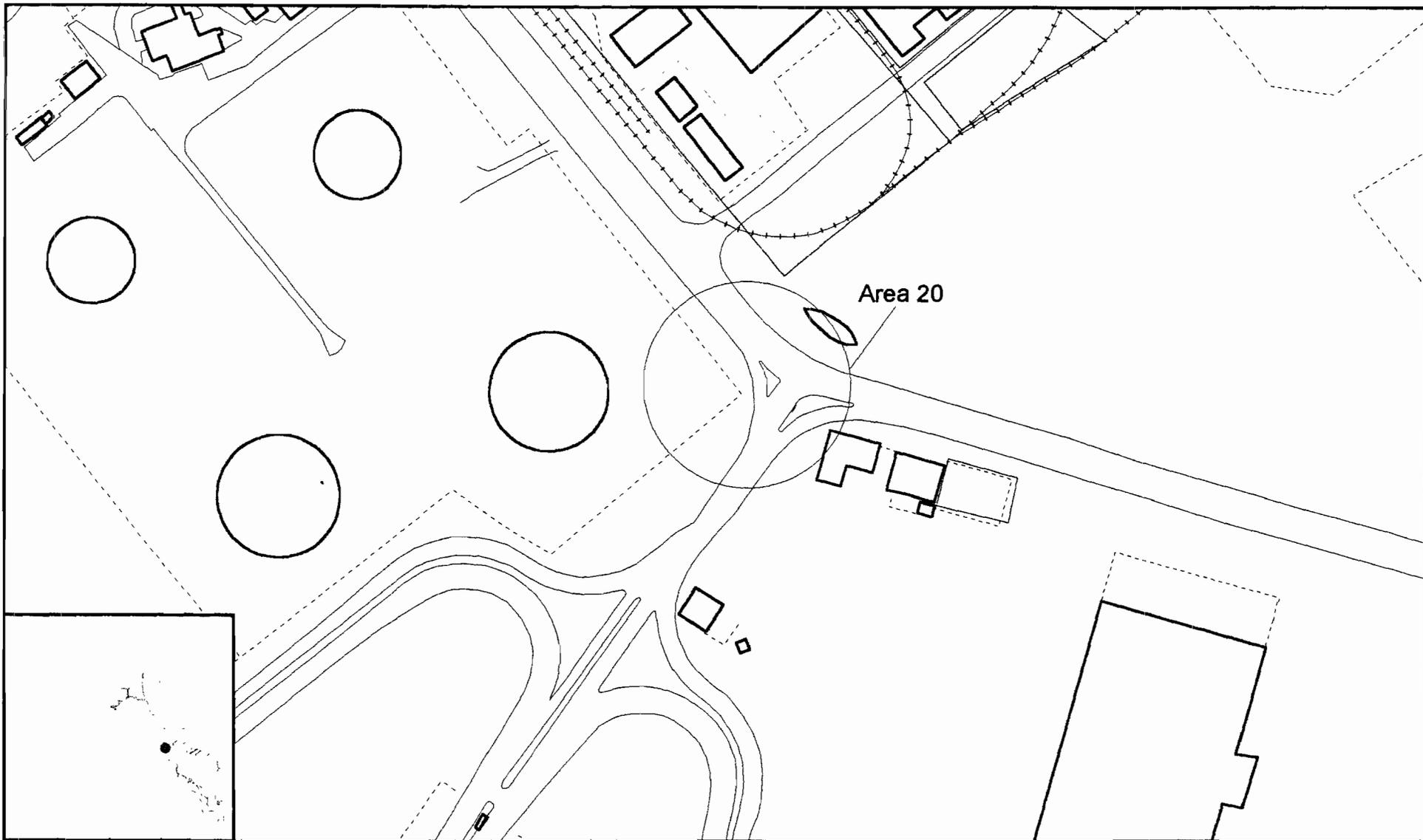
- |                  |
|------------------|
| □ AOC Boundary   |
| ∩∩ SWMU Boundary |



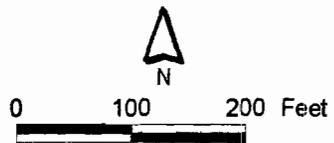
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**Figure 2**  
 Site Vicinity Map  
 Area 20  
 Charleston Naval Complex

**CH2MHILL**

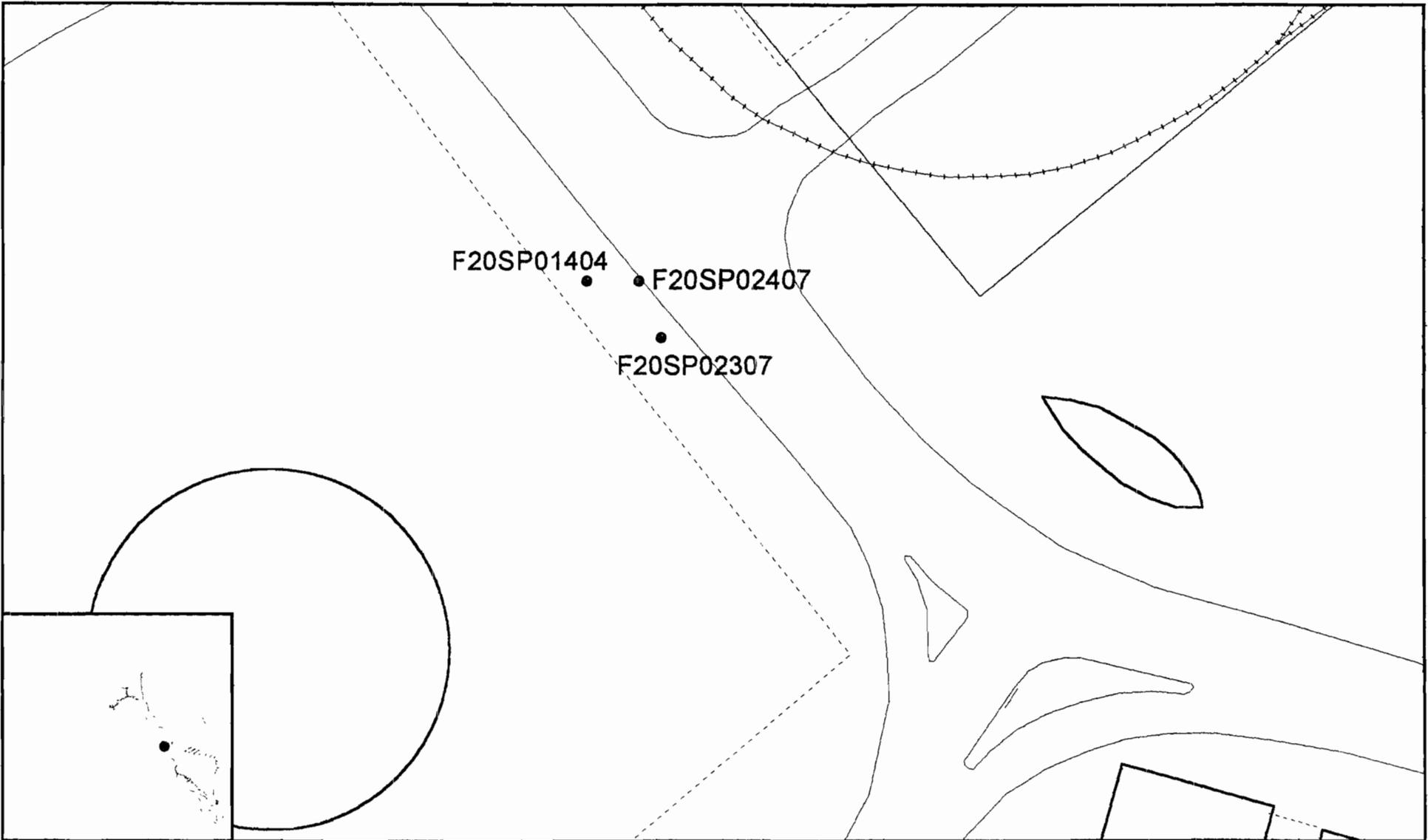


- |                  |               |
|------------------|---------------|
| Fence            | AOC Boundary  |
| Railroads        | SWMU Boundary |
| Roads - Lines    | Buildings     |
| Bridges          | Zone Boundary |
| Surrounding Area |               |
| Shoreline        |               |



**Figure 3**  
 Site Location Map  
 Area 20  
 Charleston Naval Complex

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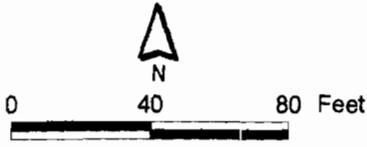


F20SP01404

F20SP02407

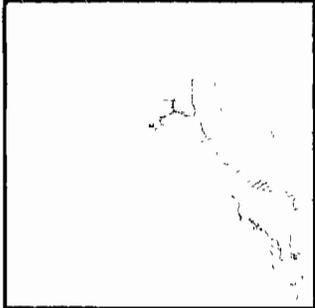
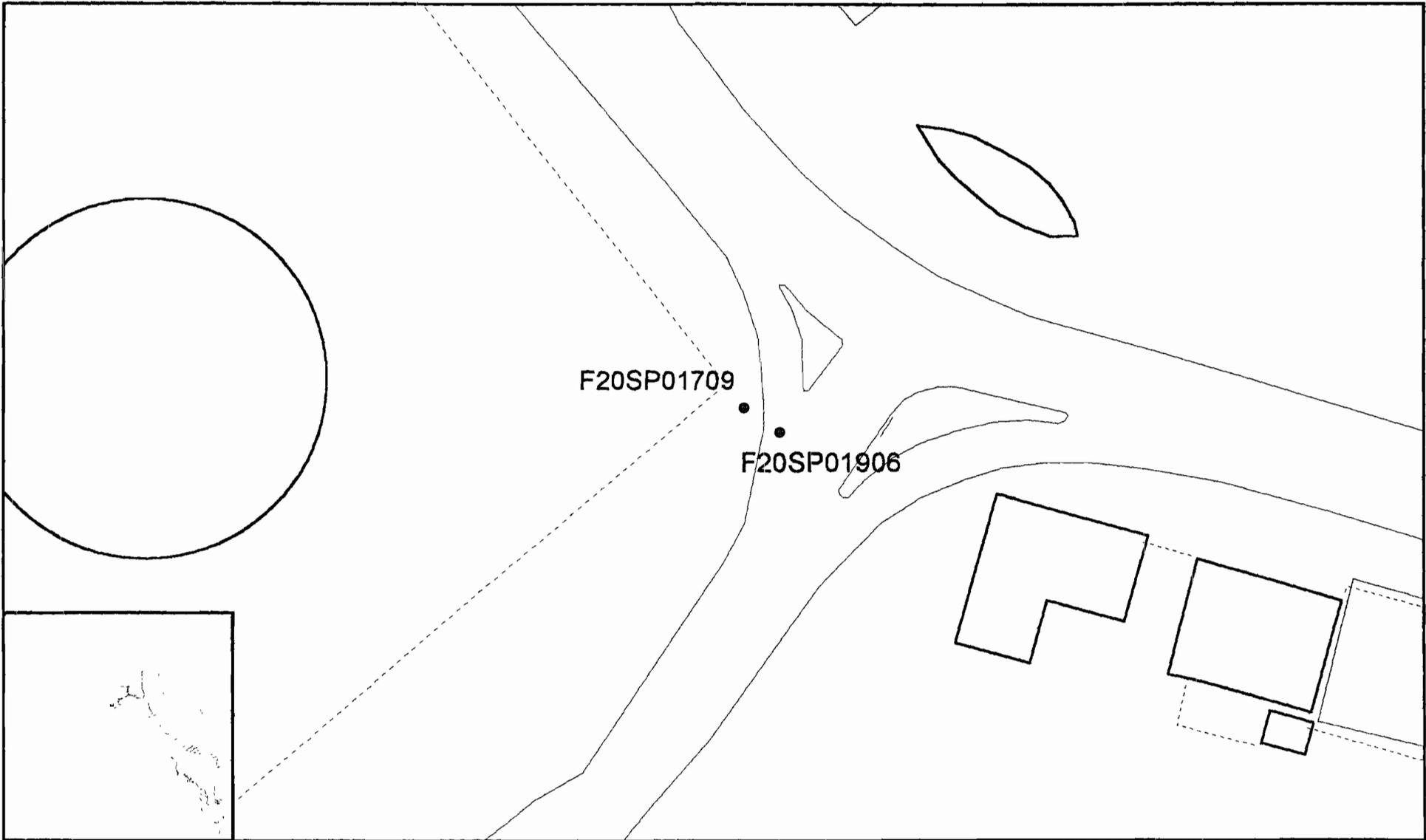
F20SP02307

- |                  |               |
|------------------|---------------|
| Fence            | Sidewalk      |
| Railroads        | Shoreline     |
| Roads - Lines    | AOC Boundary  |
| Bridges          | SWMU Boundary |
| Surrounding Area | Buildings     |
| Pavement         | Zone Boundary |



**Figure 4**  
**Existing Soil Boring Locations**  
**Area 20**  
**Charleston Naval Complex**

**CH2MHILL**



- Fence
- Railroads
- Roads - Lines
- Bridges
- Surrounding Area
- Pavement
- Sidewalk
- Shoreline
- AOC Boundary
- SWMU Boundary



**Figure 5**  
 Existing Soil Borings  
 Area 20  
 Charleston Naval Complex

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