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CORRECTIVE ACTION PLAN FOR HOBSON FUEL FARM ZONE G AREA 21 CNC
CHARLESTON SC
5/1/2001
CH2M HILL

**CORRECTIVE ACTION PLAN
FOR
HOBSON FUEL FARM
ZONE G/ AREA 21**

SITE IDENTIFICATION # 01144

**Charleston Naval Complex
Charleston, South Carolina**

**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND**

Contract Number N62467-99-C-0960

May 2001

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FOR
HOBSON FUEL FARM
ZONE G/ AREA 21**

SITE IDENTIFICATION # 01144

**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 No. 14220 Date 5/24/01

South Carolina Registration No. 14220

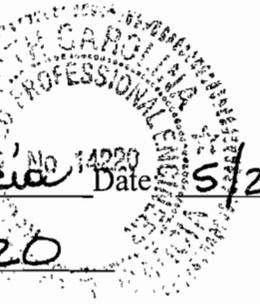


TABLE OF CONTENTS

| Section | Page |
|--|------------|
| ACRONYMS..... | iii |
| 1.0 INTRODUCTION..... | 1-1 |
| 1.1 GENRAL SITE DESCRIPTION..... | 1-1 |
| 1.2 OBJECTIVE | 1-1 |
| 2.0 PROPOSED CORRECTIVE ACTION..... | 2-1 |
| 3.0 MONITORING WELL INSTALLATON AND ABANDONMENT | 3-1 |
| 3-1 MONITORING WELL INSTALLATION | 3-1 |
| 3-2 MONITORING WELL ABANDONMENT | 3-1 |
| 3-3 SURVEYING | 3-1 |
| 3-4 EQUIPMENT DECONTAMINATION..... | 3-1 |
| 4.0 PROPOSED PROGRAM..... | 4-1 |
| 4-1 SOIL BORING SCHEDULE | 4-1 |
| 4-2 GW SAMPLE SCHEDULE | 4-1 |
| 4-3 ANALYTICAL PARAMETERS | 4-1 |
| 4-4 FIELD MEASUREMENTS..... | 4-1 |
| 4-5 GW LEVEL MEASUREMENTS..... | 4-1 |
| 4-6 SAMPLE HANDELING | 4-2 |
| 4-7 SAMPLE PACKING AND SHIPPING | 4-2 |
| 4-8 QUALITY CONTROL..... | 4-2 |
| 4-9 FIELD QA/QC..... | 4-3 |
| 4-10 CONTROL LIMITS | 4-3 |
| 4-11 RECORD KEEPING..... | 4-3 |
| 4-12 SITE MANAGEMENT AND BASE SUPPORT | 4-3 |
| | |
| 5.0 REFERENCES..... | R-1 |
| | |
| 6.0 ATTACHMENT A..... | 6-1 |

7.0

FIGURES

FIG 1.....SITE LOCATION MAP

FIG 2.....SITE VICINITY MAP

FIG 3..... MONITORING WELL LOCATION MAP

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 21 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: 01144. This CAP provides methods for 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 Berkeley 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 21 on March 6, 2001. The CAR describes Area 21 as being located along the south-central portion of the Hobson Fuel Farm. Area 21 is within the foundation location for the proposed warehouse. For more information on Area 21 in the Hobson Fuel Farm, see the CAR completed by Ensafe in March 2001.

1.2 Objective

This CAP presents a plan monitor wells in Area 21 in order to support intrinsic remediation. If contaminated soils are not encountered during the proposed construction of the warehouse, the foundation of the warehouse will be used as a permanent barrier for any contaminants that may be in the ground. In this case land use controls may be implemented.

2.0 PROPOSED CORRECTIVE ACTION

Based on the discussion of the CAR, and SCDHEC correspondence letter dated 2 April 2001, groundwater will be monitored at this site for a period of one year on a quarterly basis. Historically levels of SVOCs exceeded the Risk Based Screening Levels (RBSLs) for surface and subsurface soils in the vicinity of Area 21. Contaminated soils will be capped by the foundation of the future warehouse. It is anticipated that the future construction in this area will require the grade to be elevated. However, as of the writing of this report, final plans are not available. 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 additional monitoring wells will be installed at Area 21.

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 Groundwater Sampling

Following approval of this CAP, monitoring wells FDSGW13B, FDSGW08A, FDSGW11A, and FDSGW15C as seen in Figure 3, will be used to support natural attenuation. CH2M-Jones, LLC recommends one year of sampling in three-month intervals (quarterly sampling). If the analytical results indicate that there are no contaminants at the site, No Further Action may be recommended for Area 21.

- **Groundwater Sampling**

No Groundwater sampling proposed until construction is complete.

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 monitoring well.

- BTEX 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.

Ensafe, 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

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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

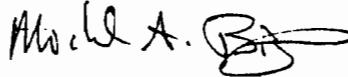
Per the referenced report, levels of SVOCs exceed the RBSL limits for soils. No VOCs were detected above the RBSL limits. Surface soil samples from HFFSP004, HFFSP006 and HFFSP007 exceed RBSL limits for dermal contact. The subsurface sample from HFFSP00802 exhibited levels of Naphthalene above the RBSL 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.

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

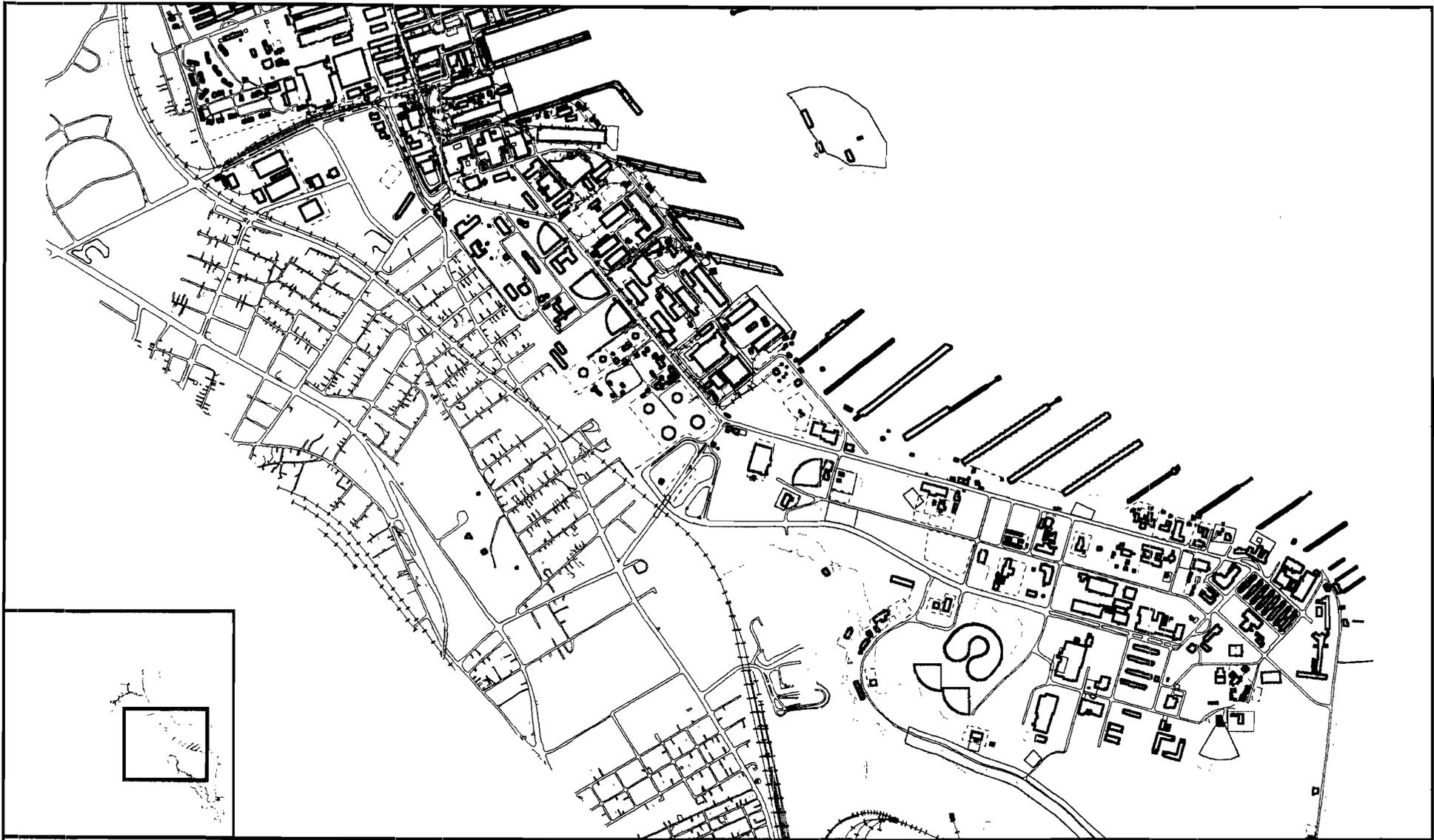
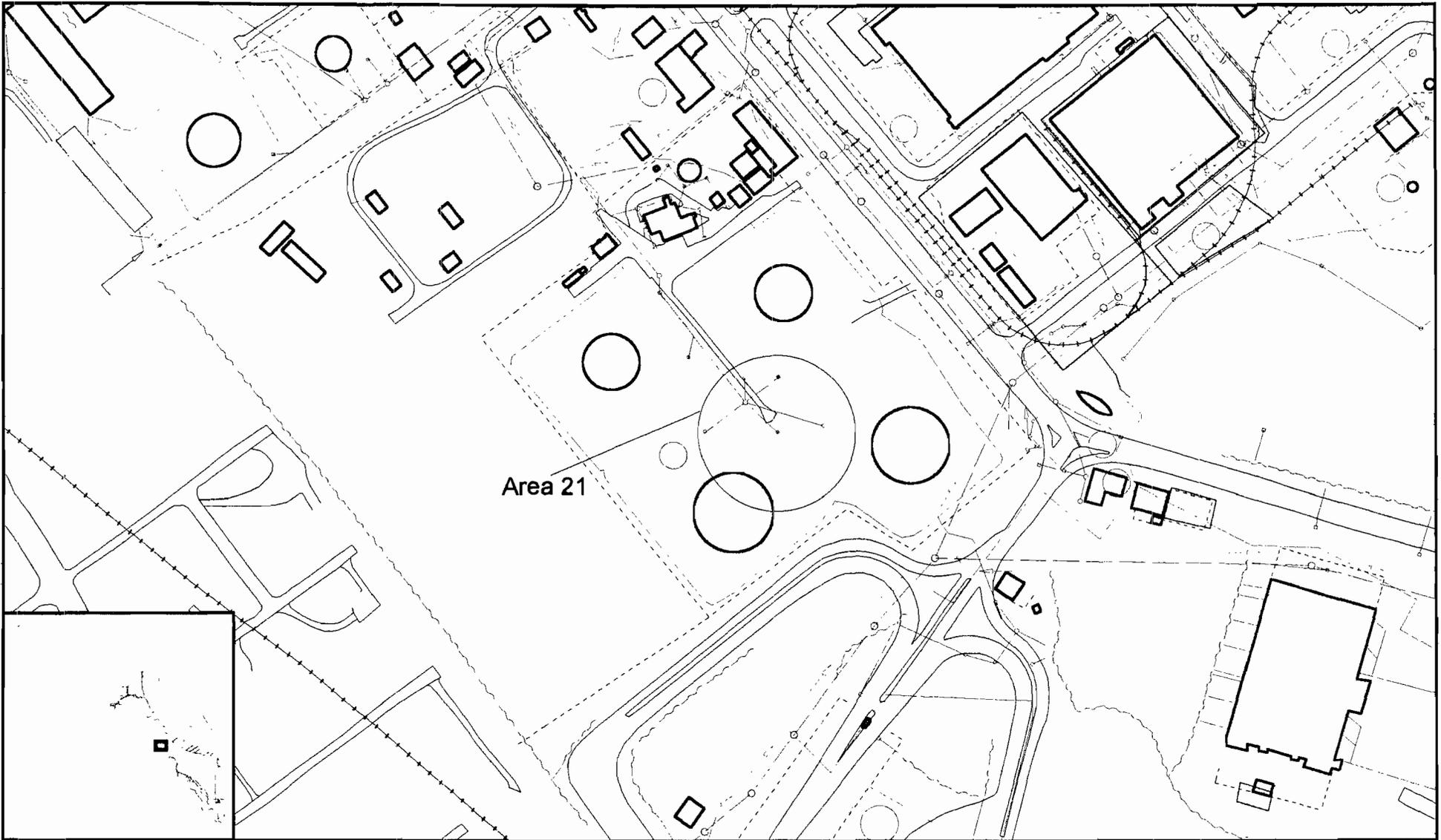


Figure 1
 Site Location Map
 Area 21 HFF
 Charleston Naval Complex

CH2MHILL



- | | | | |
|---|-----------------------|---|-----------------------|
| ∨ | DRAIN-LABEL | ∨ | STORM-FLOW-ARROW |
| ∨ | DRAIN-BASIN | ∨ | SEWER-LINE/MANHOLE-NS |
| ∨ | DRAIN-LINE | ∨ | SEWER-LINE/MANHOLE |
| ∨ | STORM-OUTFALL-ID | ∨ | SEWER-FLOW-ARROW |
| | STORM-LINE/MANHOLE | | |
| | STORM-LINE/MANHOLE-NS | | |

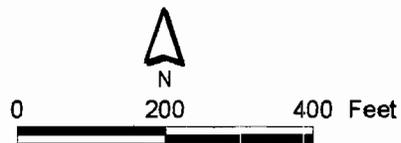


Figure 2
 Site Vicinity Map
 Area 21 HFF
 Charleston Naval Complex

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