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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT
ADDENDUM AREA OF CONCERN 537 (AOC 537) ZONE E CNC CHARLESTON SC
8/29/2002
CH2M HILL

RFI REPORT ADDENDUM

Area of Concern 537, Zone E



***Charleston Naval Complex
North Charleston, South Carolina***

SUBMITTED TO
***U.S. Navy Southern Division
Naval Facilities Engineering Command***

CH2M Jones

August 2002

Contract N62467-99-C-0960



CH2MHILL

CH2M HILL
3011 S.W. Williston Road
Gainesville, FL
32608-3928
Mailing address:
P.O. Box 147009
Gainesville, FL
32614-7009
Tel 352.335.7991
Fax 352.335.2959

August 29, 2002

Mr. David Scaturo
South Carolina Department of Health and
Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Re: RFI Report Addendum (Revision 0) – AOC 537, Zone E

Dear Mr. Scaturo:

Enclosed please find four copies of the RFI Report Addendum (Revision 0) for AOC 537 in Zone E of the Charleston Naval Complex (CNC). This report has been prepared pursuant to agreements by the CNC BRAC Cleanup Team for completing the RCRA Corrective Action process.

The principal author of this document is Kris Garcia. Please do not hesitate to contact her at 770/604-9182, extension 476, should you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

cc: Rob Harrell/Navy, w/att
Gary Foster/CH2M HILL, w/att

RFI REPORT ADDENDUM

Area of Concern 537, Zone E



***Charleston Naval Complex
North Charleston, South Carolina***

SUBMITTED TO
***U.S. Navy Southern Division
Naval Facilities Engineering Command***

PREPARED BY
CH2M-Jones

August 2002

*Revision 0
Contract N62467-99-C-0960
158814.ZE.PR.01*

**Certification Page for RFI Report Addendum (Revision 0) –
AOC 537, Zone E**

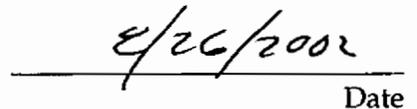
I, Dean Williamson, certify that this report has been prepared under my direct supervision. The data and information are, to the best of my knowledge, accurate and correct, and the report has been prepared in accordance with current standards of practice for engineering.

South Carolina

P.E. No. 21428



Dean Williamson, P.E.



Date

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1 **Acronyms and Abbreviations**

2	AOC	Area of concern
3	AST	Aboveground storage tank
4	BCT	BRAC Cleanup Team
5	BRAC	Base Realignment and Closure Act
6	CA	Corrective action
7	CNC	Charleston Naval Complex
8	COC	Chemical of concern
9	COPC	Chemical of potential concern
10	CSI	Confirmatory sampling investigation
11	DMP	Data Management Plan
12	EnSafe	EnSafe Inc.
13	EPA	U.S. Environmental Protection Agency
14	ESDLOQCM	Environmental Services Division Laboratory Operations and Quality
15		Control Manual
16	ESDSOPQAM	Environmental Services Division Standard Operating Procedures and
17		Quality Assurance Manual
18	ft ²	Square foot
19	ft bls	Feet below land surface
20	GIS	Geographic information system
21	IM	Interim measure
22	LUC	Land use control
23	MCL	Maximum contaminant level
24	μg/kg	Micrograms per kilogram
25	mg/kg	Milligrams per kilogram
26	NAVBASE	Naval Base
27	NFA	No further action
28	OWS	Oil/water separator
29	RCRA	Resource Conservation and Recovery Act

1 **Acronyms and Abbreviations, Continued**

2	RFA	RCRA Facility Assessment
3	RFI	RCRA Facility Investigation
4	ROC	Run of crusher
5	SCDHEC	South Carolina Department of Health and Environmental Control
6	SWMU	Solid waste management unit
7	UST	Underground storage tank

1.0 Introduction

In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for closure as part of the Defense Base Realignment and Closure Act (BRAC), which regulates closure and transition of property to the community. The Charleston Naval Complex (CNC) was formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE on April 1, 1996.

Corrective Action (CA) activities are being conducted under the Resource Conservation and Recovery Act (RCRA) with the South Carolina Department of Health and Environmental Control (SCDHEC) as the lead agency for CA activities at the CNC. All RCRA CA activities are performed in accordance with the Final Permit (Permit No. SC0 170 022 560).

In April 2000, CH2M-Jones was awarded a contract to provide environmental investigation and remediation services at the CNC. This submittal has been prepared by CH2M-Jones to complete the RCRA Facility Investigation (RFI) for Area of Concern (AOC) 537 in Zone E of the CNC. The site is recommended for No Further Action (NFA). The area of the CNC in which AOC 537 is located is zoned for industrial use (M-2). Figure 1-1 illustrates the location of AOC 537 within Zone E. Figure 1-2 is an aerial photograph of AOC 537 taken in 1997.

1.1 Background

1.1.1 Site History

AOC 537 consists of an electrical substation at Building 342, a 2,728 square-foot (ft²) single story concrete block building on a slab floor. The building houses an electrical transformer substation, an electrical parts storage area, and an insulation shop. The equipment previously used at the site is unknown, although circuit breakers, dry transformers, and high-voltage switches were present at the substation during the recent site visit. Waste materials identified in the RCRA Facility Assessment (RFA) as associated with this unit include dielectric fluid, insulation, and an oily substance on the insulation shop floor observed during the RFA. According to the RFA for AOC 537, the results of tests conducted in 1987 indicated that the dielectric fluid contained less than 50 micrograms per kilogram ($\mu\text{g}/\text{kg}$) of polychlorinated biphenyls (PCBs). Based on the results of the RFA, a Confirmatory Sampling Investigation (CSI) was recommended. The CSI sampling event for AOC 537 was conducted in April 2002.

1 **1.1.2 Summary of Interim Measures and UST/AST Removals at AOC 537**

2 **UST/AST Removals**

3 No known underground storage tanks (USTs) or aboveground storage tanks (ASTs) were
4 identified for this site.

5 **Interim Measures**

6 No interim measures (IMs) have been conducted at the site.

7 **1.2 Purpose of the RFI Report Addendum**

8 This RFI Report Addendum provides information about AOC 537, including the results of
9 the sampling performed for the CSI. The results of the CSI are presented to complete the
10 nature and extent investigation to identify chemicals of potential concern (COPCs). Based
11 on a review of these results, AOC 537 is recommended for NFA.

12 Prior to changing the status of any site in the CNC RCRA CA permit, the BRAC Cleanup
13 Team (BCT) agreed that the following issues should be considered:

- 14 • Status of the RFI
- 15 • Presence of metals (inorganics) in groundwater
- 16 • Potential linkage to Solid Waste Management Unit (SWMU) 37, Investigated Sanitary
17 Sewers at the CNC
- 18 • Potential linkage to AOC 699, Investigated Storm Sewers at the CNC
- 19 • Potential linkage of AOC 504, Investigated Railroad Lines at the CNC
- 20 • Potential linkage to surface water bodies (Zone J)
- 21 • Potential contamination associated with oil/water separators (OWSs)
- 22 • Relevance or need for land use controls (LUCs) at the site

23 Information regarding these issues is provided in this RFI Report Addendum to expedite
24 evaluation of closure of the site.

25 Provided that the information presented in this report is adequate to address these site
26 closeout items, it is expected that the BCT will concur that NFA is appropriate for AOC 537.
27 At that time, a Statement of Basis will be prepared and made available for public comment
28 in accordance with SCDHEC policy. This will allow for public participation in the final
29 remedy selection.

1 **1.3 Report Organization**

2 This RFI Report Addendum consists of the following sections, including this introductory
3 section:

4 **1.0 Introduction** – Presents the purpose and background information relating to this RFI
5 Report Addendum.

6 **2.0 Site Setting** – Summarizes the geologic and hydrogeologic setting of AOC 537.

7 **3.0 Field Investigation and Data Validation** – Summarizes the conclusions from the CSI
8 field investigation and data validation for AOC 537.

9 **4.0 COPC Screening** – Describes the results from the comparison of analytical results to
10 COPC screening criteria.

11 **5.0 COPC/COC Refinement** – Includes the evaluation of COPCs to determine whether they
12 are defined as chemicals of concern (COCs) for AOC 537.

13 **6.0 Summary of Information Related to Site Closeout Issues** – Discusses the various
14 issues that the BCT agreed to evaluate prior to site closeout.

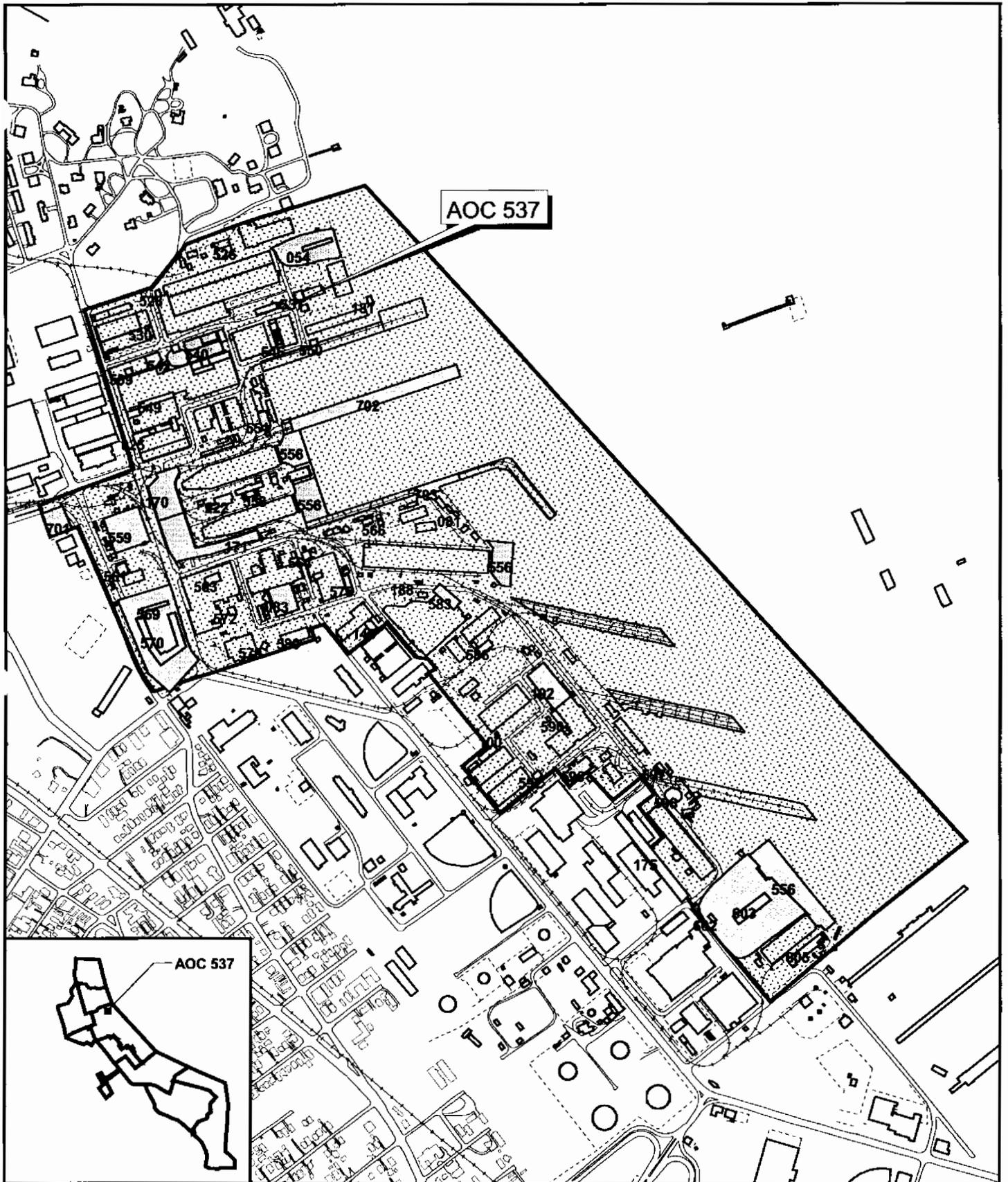
15 **7.0 Conclusions and Recommendations** – Summarizes the conclusions and
16 recommendations of the CSI field investigation at AOC 537.

17 **8.0 References** – Lists the references used in this document.

18 **Appendix A** contains a technical memorandum that describes the attempts made to
19 conduct the field investigation at AOC 537.

20 **Appendix B** contains photo documentation of field conditions at AOC 537.

21 All tables and figures appear at the end of their respective sections.



-  Zone E Boundary
-  SWMU/AOC Within Zone E Boundary



0 800 1600 Feet

1 inch = 800 feet

Figure 1-1
 Zone E Within CNC
 AOC 537, Zone E
 Charleston Naval Complex

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-  SWMU 537
-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

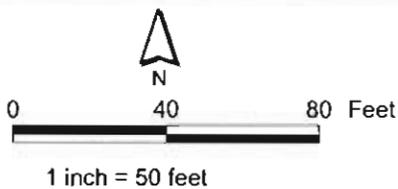


Figure 1-2
 Site Map
 AOC 537, Zone E
 Charleston Naval Complex

1 **2.0 Site Setting**

2 The regional physiographic and geologic setting for the CNC area is described in the *Final*
3 *Zone A RFI Report, Revision 0* (EnSafe Inc. [EnSafe]/ Allen & Hoshall, 1996). The regional
4 hydrology and hydrogeology for the CNC area is also described in the Zone A RFI Report.

5 **2.1 Geologic Setting**

6 Detailed descriptions of the Quaternary- and Tertiary-age sediments encountered during
7 the Zone E RFI, along with a detailed discussion of the various lithologic units encountered
8 in Zone E, are presented in Section 2.2.1 of the *Zone E RFI Report, Revision 0* (EnSafe, 1997).

9 Due to extensive surface soil disturbance at the CNC during its operational history,
10 approximately the upper 5 feet (ft) of the subsurface are typically a mixture of artificial fill
11 and native sediments. However, the extent of fill placement varies within Zone E. Areas
12 where extensive excavations have been performed or where native soils may have been
13 unsuitable for foundation support may have undergone more extensive fill placement.
14 Detailed descriptions of the soil types encountered in Zone E are presented in Section 2.2.3.3
15 of the RFI report.

16 A review of the historical maps from 1909 to the present indicates that the overall area has
17 been subjected to a series of dredging, construction, demolition, and expansion activities
18 over the years. The current structure was constructed sometime between 1970 and 1977.
19 From at least 1920 to 1970, the area was identified as Ship Building Ways. According to the
20 legends on the 1920 and 1922 public works maps, the Ways appear to be some type of pier-
21 like structure that extended into the Cooper River. The 1967 public works map indicates
22 that the area was used as a small boat repair slip. Sometime between 1970 and 1977, the
23 structure referred to as 342 Building Ways began to undergo some demolition/rebuilding
24 and only the southwestern corner of the original structure currently survives as Building
25 342.

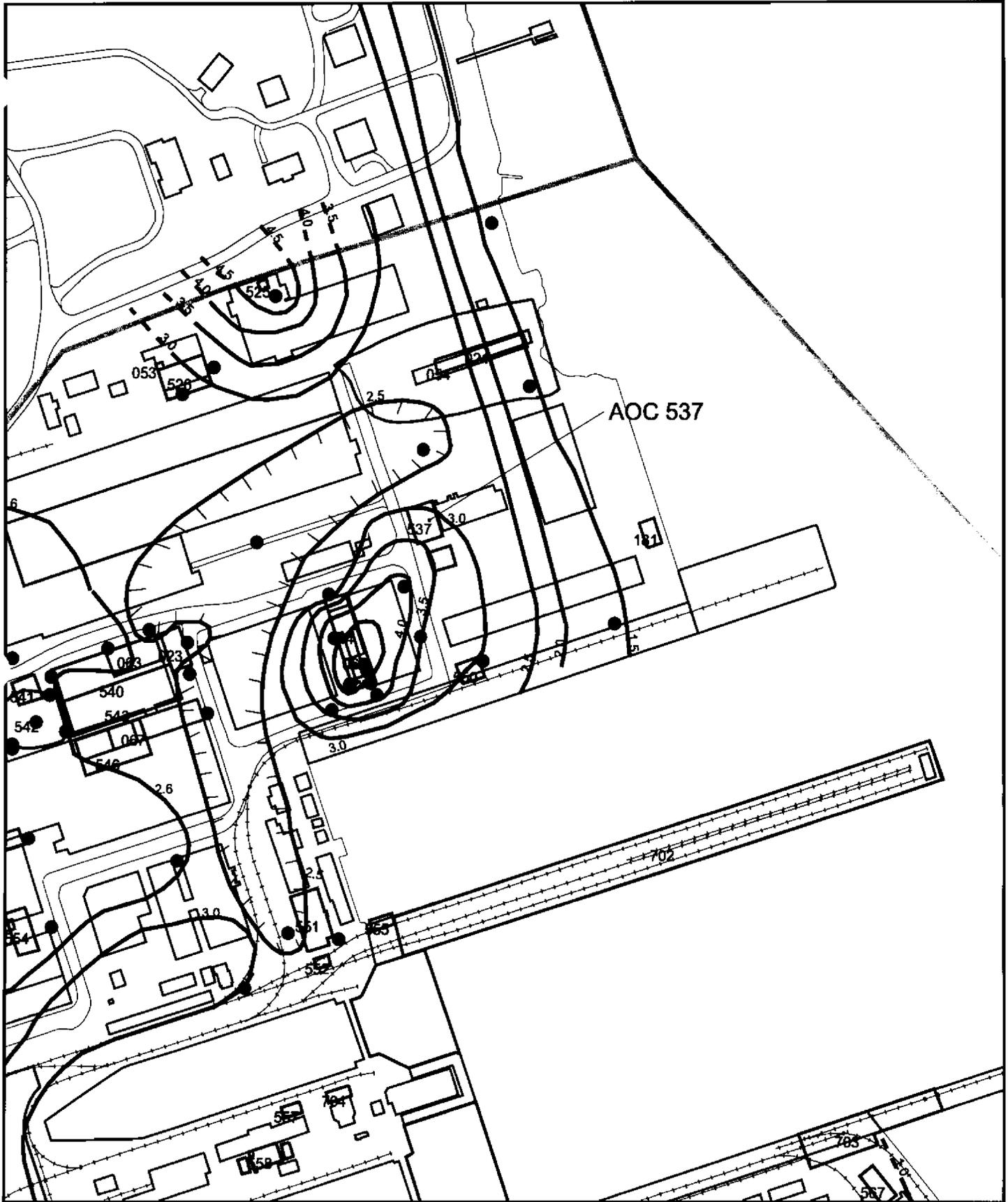
26 **2.2 Hydrogeologic Setting**

27 Based on information presented in Section 2.3 of the RFI report and a recent re-evaluation of
28 the groundwater flow patterns in the area, it appears that the groundwater flow
29 environment in Zone E is complex and is influenced by several factors:

- 1 • The eastern boundary of Zone E is the Cooper River, a regional groundwater discharge
- 2 zone
- 3 • The Cooper River is tidally influenced
- 4 • The shallow subsurface has been heavily disturbed by anthropogenic activities related
- 5 to industrial work within Zone E in the form of utilities, non-native fill material, support
- 6 pilings, railroad lines, crane rails, etc.
- 7 • Geologic heterogeneity predominates the subsurface

8 Detailed descriptions of the surficial aquifer, groundwater flow patterns, horizontal and
9 vertical hydraulic gradients, horizontal hydraulic conductivities, grain-size distribution,
10 and tidal influences are presented in Section 2.3 of the RFI report. The types of information,
11 documentation and descriptions of various methodologies used in developing this
12 information are also presented in Section 2.3 of the RFI report.

13 A recent shallow groundwater contour map has been developed for Zone E, using
14 contemporaneous water level elevation data collected in April 2002 (see Figure 2-1). Based
15 on the data, groundwater in the vicinity of AOC 537 appears to ultimately flow generally
16 north or east toward the Cooper River; however, there are be some strongly localized effects
17 due to the presence of the concrete quay walls in the vicinity of Pier C, which is located to
18 the south and east. The man-made structures control the local groundwater flow patterns in
19 this area. Depth to groundwater in the vicinity of AOC 537 is estimated to be approximately
20 3½ feet below land surface (ft bls).



- Known Shallow Groundwater Contour (5/14/02)
- Inferred Shallow Groundwater Contour (5/14/02)
- Fence
- Railroads
- Roads
- Groundwater Well
- AOC Boundary
- SWMU Boundary
- Buildings
- Zone Boundary



0 200 400 Feet

1 inch = 250 feet

Figure 2-1
 Shallow Groundwater Contours
 AOC 537, Zone E
 Charleston Naval Complex



3.0 Field Investigation and Data Validation

3.1 Investigation Objectives

The sampling strategy for AOC 537, as described in the *RFI Addendum Sampling Plan: Uninvestigated Sites – Zone E, Revision 1* (CH2M-Jones, 2001a), was designed to collect sufficient environmental media data to accomplish the following:

- Characterize site conditions
- Define the nature and extent of contamination, if any
- Assess human health and ecological risk
- Assess the need for additional investigation or corrective measures

3.2 Sampling Procedures, Protocols, and Analyses

The sampling activities were performed in accordance with the Environmental Services Division *Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM) (U.S. Environmental Protection Agency [EPA], 1996a); the *Final Comprehensive RFI Work Plan* (EnSafe/Allen & Hoshall, 1994); the *RFI Addendum Sampling Plan: Uninvestigated Sites - Zone E, Revision 1* (CH2M-Jones, 2001a); and the *Charleston Naval Complex Project Team Notebook and Instructions, Revision 1A* (CH2M-Jones, 2001b).

3.2.1 Concrete/Asphalt Coring

During the CSI field investigation, it was found that the thickness of the asphalt was approximately 6 inches. Due to buried obstructions, soil beneath the asphalt was not accessible for sampling.

3.2.2 Soil Sampling

In April 2002, CH2M-Jones mobilized the field team at AOC 537. The team was scheduled to collect surface and subsurface soil samples at three locations: E537SB001, E537SB002, E537SB003 (see Figure 3-1). A coring subcontractor, Penhall Drilling Co., was also present onsite to core through asphalt and an approximately 3.5-foot thick sublayer of run of crusher (ROC). After the coring was completed and the holes established, a hand auger was used to attempt to collect soil samples. However, buried obstructions were encountered at the bottom of the borehole at each location. In no instance was the field team able to penetrate the obstruction or to collect soil samples from the borings.

1 In response, CH2M-Jones tasked a drilling subcontractor, Columbia Technologies, to
2 attempt to conduct direct-push technology(DPT) sampling. The Columbia driller attempted
3 to punch through the subsurface obstructions utilizing a cone tip. After some hammering,
4 the cone tip was able to break through a 0.5-foot layer of asphalt (3 to 3.5 ft bls), but
5 immediately encountered hard quartz-like material that was believed to be concrete at 3.5 ft
6 bls. The material that was encountered below the buried asphalt prevented further
7 penetration, despite attempts made at one sample location (E537SB001). Appendix A
8 contains a technical memorandum that describes the attempts made to conduct the field
9 investigation at AOC 537. Appendix B contains photo documentation of field conditions at
10 AOC 537.

11 In response to the review of the Zone E RFI Addendum Sampling Plan for the
12 Uninvestigated Units, one specifically relevant comment that addressed similar field
13 conditions was received from SCDHEC:

14 *Comment 4, Section 3.4.1, Page 3-2: This section states that coring will be conducted through*
15 *concrete that may be up to several feet thick to collect soil samples. If the staining is minimal and*
16 *intermittent, and there is no reason to believe that penetration through the concrete has occurred,*
17 *then coring thorough such a thick slab of concrete may be unnecessary. The Department will not*
18 *require this sampling; therefore, it is up to CH2M-Jones's discretion whether or not to collect*
19 *these soil samples.*

20 No surface or subsurface soil samples could be collected at AOC 537 due to the presence of
21 buried thick pavement and subsurface obstructions. In addition, visual observation of
22 conditions at this site did not reveal any evidence that a release had occurred. For these
23 reasons, CH2M-Jones determined that sample collection was not practical at this site.

24 Each location attempted was surveyed for positioning in the CNC geographic information
25 system (GIS). Coordinate information is presented in Table 3-1.

26 **3.2.3 Decontamination Procedures**

27 All decontamination activities were conducted in accordance with the procedures outlined
28 in the *Final Comprehensive RFI Work Plan (EnSafe/Allen & Hoshall, 1994)* and the *RFI*
29 *Addendum Sampling Plan: Uninvestigated Sites - Zone E, Revision 1 (CH2M-Jones, 2001a)*.

30 **3.3 Soil Analytes**

31 No soil samples were obtained for analysis.

1 **3.4 Data Management**

2 Record keeping and data management practices for both field data and analytical data
3 collected during the initial RFI investigation in 1995 were maintained consistent with the
4 Data Management Plan (DMP) in the approved *Final Comprehensive RFI Work Plan*
5 (EnSafe/Allen & Hoshall, 1994) to verify that all information and data were properly
6 recorded and documented. Electronic data will be maintained in a database by CH2M-Jones
7 for long-term data storage and management.

TABLE 3-1
Sampling Location Coordinates
RFI Report Addendum, AOC 537, Zone E, Charleston Naval Complex

New Sample ID	Northing	Easting
I537SB001	377,412.2	2,317,568.5
I537SB002	377,359.5	2,317,550.9
I537SB003	377,336.7	2,317,582.6

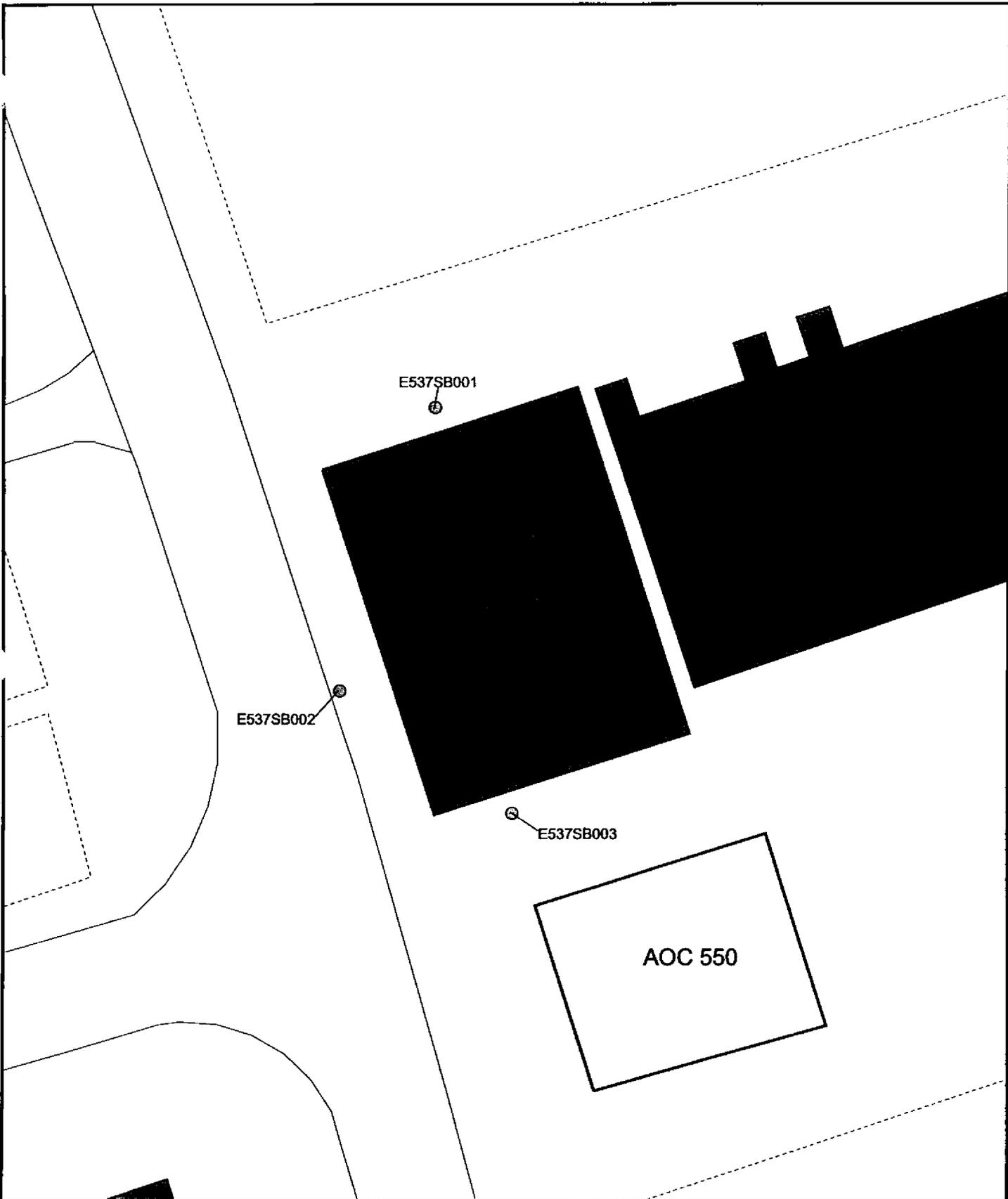


Figure 3-1
 Soil Sample Locations
 AOC 537, Zone E
 Charleston Naval Complex

1 **4.0 COPC Screening**

- 2 Due to site conditions, CH2M-Jones was unable to collect soil samples for analysis and
3 screening. The narrative provided in Appendix A describes attempts that were made to
4 obtain surface and subsurface soil samples at this site.

Section 5.0

1 **5.0 COPC/COC Refinement**

- 2 No CSI analytical results were available for AOC 537; therefore, no COPCs were identified
- 3 and no detailed screening was conducted.

6.0 Summary of Information Related to Site Closeout Issues

6.1 RFI Status

The CSI investigation findings, as reported herein, satisfy the requirements of the RFI. Based on field conditions observed during the CSI field investigation conducted in April 2002, the nature and extent of the COPCs has been adequately defined.

AOC 537 was not included in the *Zone E RFI Report, Revision 0* (EnSafe, 1997). Thus, there have been no RFI comments issued with respect to this unit. With submittal of this RFI Report Addendum, the RFI requirements are considered to be complete.

The remaining subsections address the issues that the BCT agreed to evaluate prior to site closeout.

6.2 Presence of Inorganics in Groundwater

For the purpose of site closeout documentation, the inorganics in groundwater issue refers to the occasional or intermittent detection of several metals (primarily arsenic, thallium, and antimony) in groundwater at concentrations above the applicable maximum contaminant level (MCL), preceded or followed by detections of these same metals below the MCL or below the practicable quantitation limit. Groundwater is not a medium of concern at AOC 537. No additional evaluation of this issue is warranted.

6.3 Potential Linkage to SWMU 37, Investigated Sanitary Sewers at the CNC

The sanitary sewer investigation (SMWU 37) was designed to include segments of the sewer where releases of contamination were known or considered likely to have occurred. Investigations related to SWMU 37 were not conducted in the vicinity in association with Building 342 or AOC 537. A sewer manhole is present within the footprint of AOC 537, but this area was not investigated. However, there is no known or sewage disposal system in Building 342 that could link SWMU 37 and AOC 537. Further evaluation of this issue is not warranted.

1 **6.4 Potential Linkage to AOC 699, Investigated Storm Sewers** 2 **at the CNC**

3 Investigated segments of the storm sewer (AOC 699) were identified in the *Zone L RFI*
4 *Report, Revision 0* (EnSafe, 1998). A stormwater line flows beneath AOC 537. The nearest
5 manhole is located approximately 70 feet west of AOC 537. Stormwater in the vicinity of
6 AOC 537 collected at the intersection at the southwest corner of the unit (Roe Avenue and
7 Second Street. Stormwater discharges through stormwater outfall 23. The sections of the
8 stormwater sewer system in the vicinity of the site were not investigated as part of the AOC
9 699 investigations. There are no data or information to suggest that AOC 537 has impacted
10 the storm sewer system and groundwater is not a medium of concern at this site. Further
11 investigation of a linkage between the storm sewer system and AOC 537 is not warranted.

12 **6.5 Potential Linkage to AOC 504, Investigated Railroad Lines** 13 **at the CNC**

14 Investigated segments of the CNC railroad lines (AOC 504) were identified in the *Zone L*
15 *RFI Report, Revision 0* (EnSafe, 1998). No investigations related to AOC 504 were conducted
16 at AOC 537.

17 Based on review of historical public works maps in the vicinity of AOC 537, the original
18 railroad lines were constructed sometime between 1920 and 1922. These lines included a
19 railroad line spur that accessed the northwest corner of the 342 Ship Building Way and a
20 second spur that passed immediately adjacent to the southeastern side of Building 342.
21 Sometime between 1962 and 1966, these railroad lines were removed. There is no known
22 linkage between AOC 537 and the investigated railroad lines. Further evaluation of this
23 issue is not warranted.

24 **6.6 Potential Migration Pathways to Surface Water Bodies at** 25 **the CNC**

26 The nearest surface water body to AOC 537 is the Cooper River, which lies approximately
27 400 feet to the east. There were no COCs identified for soil. Therefore, there are no
28 migration pathways of concern. Further evaluation of this issue is not warranted.

1 **6.7 Potential Contamination in Oil/Water Separators**

2 There are no OWSs known to be associated with this site. In addition, there is no reference
3 made to an OWS at this facility in the *Oil Water Separator Data* report (Department of the
4 Navy, September 2000). Further evaluation of OWSs is not warranted.

5 **6.8 Land Use Controls (LUCs)**

6 There were no COCs identified for AOC 537. Therefore, no land use restrictions are needed
7 for AOC 537. This site is zoned M-2 (marine-industrial) and will likely be used for non-
8 residential future land use.

9 Regardless, the CNC BCT has agreed that all of Zone E will have at least some LUCs and
10 restrictions. At a minimum, these LUCs are likely to include restrictions against residential
11 land use. Although there are no COCs at this particular site, LUCs applied across Zone E
12 will apply at this site.

1 **7.0 Conclusions and Recommendations**

2 AOC 537 consists of an electrical substation at Building 342 (see Figure 1-2). The building
3 houses an electrical transformer substation, an electrical parts storage area, and an
4 insulation shop. The equipment previously used at the site is unknown, although circuit
5 breakers, dry transformers, and high-voltage switches were present at the substation during
6 the recent site visit.

7 An evaluation of the site conditions observed during the CSI is summarized in Section 3.0.
8 No soil samples could be collected due to subsurface conditions, therefore COPCs or COCs
9 were identified for this site. This site is zoned M-2 (marine-industrial) and will likely be
10 designated for commercial/industrial future use. This site is recommended for NFA.

11 The BCT has agreed that LUCs will be applied across the entire Zone E of the CNC. These
12 LUCs are expected to include, at a minimum, restrictions limiting the future land use to
13 non-residential activities. Because AOC 537 is located within Zone E, these LUCs will apply
14 at this unit.

1 **8.0 References**

- 2 CH2M-Jones. *RFI Addendum Sampling Plan: Uninvestigated Sites – Zone E, Revision 1.*
3 December 2001a.
- 4 CH2M-Jones. *Charleston Naval Complex Project Team Notebook and Instructions, Revision 1A.*
5 December 2001b.
- 6 EnSafe Inc./Allen & Hoshall. *Final Comprehensive RFI Work Plan.* 1994.
- 7 EnSafe Inc./Allen & Hoshall. *Final RCRA Facility Assessment, Naval Base Charleston, Volume*
8 *II.* June 6, 1995.
- 9 EnSafe Inc./Allen & Hoshall. *Final Zone A RFI Report, Revision 0.* 1996.
- 10 EnSafe Inc. *Zone E RFI Report, Revision 0.* November 1997.
- 11 EnSafe Inc. *Zone L RFI Report, Revision 0.* December 18, 1998.
- 12 U.S. Environmental Protection Agency (EPA). *Contract Laboratory Program National*
13 *Functional Guidelines for Organic Data Review.* 1994a.
- 14 U.S. Environmental Protection Agency (EPA). *Contract Laboratory Program National*
15 *Functional Guidelines for Inorganic Data Review.* 1994b.
- 16 U.S. Environmental Protection Agency (EPA). *Standard Operating Procedures and Quality*
17 *Assurance Manual (ESDSOPQAM).* 1996a.
- 18 U.S. Environmental Protection Agency (EPA). Office of Solid Waste and Emergency
19 Response (SW846). *Test Methods for Evaluating Solid Waste, SW-846.* Revision 4. 1996b.
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Appendix A

Charleston Naval Complex - Zone E - RFI Field Investigation at AOC 537

PREPARED FOR: File

PREPARED BY: Brian R. Crawford/ CH2M-Jones

COPIES: Dean Williamson, CH2M-Jones
Tom Beisel, CH2M-Jones
Gary Foster, CH2M-Jones
Kris Garcia, CH2M-Jones

DATE: August 12, 2002

On the afternoon of 18 April 2002, Brian Crawford/CH2M HILL-Jones mobilized the field team at AOC 537. The team was scheduled to collect surface and subsurface soil samples at three locations. A subcontractor (Penhall) was also present onsite to core through asphalt and a sublayer of run of crusher (ROC) to reach the soils. After the coring was completed and the holes established, Brian used a hand auger to about 3 feet below land surface where he encountered obstructions at each location. In no instance was Brian able to penetrate the obstruction.

In response, Brian contacted Darryl Gates/CH2M HILL-Jones, who was utilizing a subcontractor, Columbia Technologies, conducting DPT sampling at another site. The personnel from Columbia brought their equipment to site AOC 537 to try to punch through the subsurface obstructions utilizing a cone tip. Columbia commenced hammering and broke through a layer of asphalt and immediately encountered a very hard layer (possibly concrete) at 3.0 feet that prevented further penetration. Brian then contacted Sam Naik/CH2M HILL-Jones, who agreed that subsurface conditions precluded any further efforts to collect the samples.

Appendix B



Figure B-1
Looking north along western side of
Building 342 - 8/12/02
AOC 537, Zone E, Charleston Naval Complex



Figure B-2
Southern side of Building 342 - 8/12/02
AOC 537, Zone E, Charleston Naval Complex



Figure B-3
Northern side of Building 342 - 8/12/02
AOC 537, Zone E, Charleston Naval Complex