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SAMPLING AND ANALYSIS PLAN AREA OF CONCERN 551 AND 552 (AOC 551 AND 552)  
ZONE E WITH TRANSMITTAL CNC CHARLESTON SC  
4/30/2003  
CH2M HILL

POC 551+552 Zone E  
SAMPLING and ANALYSIS PLAN

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 **CH2MHILL**

April 30, 2003

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

Re: Sampling and Analysis Plan —AOCs 551 and 552, Zone E

Dear Mr. Scaturo:

Enclosed please find four copies of the Sampling and Analysis Plan (SAP) for AOCs 551 and 552 in Zone E of the Charleston Naval Complex (CNC). This SAP has been prepared to complete the RCRA Facility Investigation (RFI) activities and to provide information that can be used to make decisions regarding the need for corrective measures at the site.

The principal author of this document is Jim Edens. Please contact him at (352) 335-5877, extension 2491, should you have any questions or comments.

Sincerely,

CH2M HILL



Dean Williamson, P.E.

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

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# *Sampling and Analysis Plan*

## **AOCs 551 and 552, Zone E**

**Charleston Naval Complex  
North Charleston, SC**

Prepared for  
**U.S. Navy Southern Division  
Naval Facilities Engineering Command**

Prepared by  
**CH2M-Jones**

April 2003

Contract N62467-99-C-0960

# 1 Contents

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2	Section	Page
3	<b>Acronyms and Abbreviations</b> .....	<b>iv</b>
4	<b>1.0 Introduction</b> .....	<b>1-1</b>
5	1.1 Site Description .....	1-1
6	1.2 Purpose of the Sampling and Analysis Plan .....	1-1
7	<b>2.0 Proposed Samples</b> .....	<b>2-1</b>
8	2.1 Soil Samples .....	2-1
9	2.2 Groundwater Samples .....	2-1
10	2.3 Sample Collection and Analysis Methods .....	2-1
11	Figure 2-1 Proposed Soil Boring Locations .....	2-2
12	Figure 2-2 Monitoring Well Locations .....	2-3
13	<b>3.0 References</b> .....	<b>3-1</b>

# 1 **Acronyms and Abbreviations**

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2	AOC	Area of concern
3	BCT	BRAC Cleanup Team
4	BEQ	Benzo[a]pyrene equivalent
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	EnSafe	EnSafe Inc.
12	EPA	U.S. Environmental Protection Agency
13	LUC	Land use control
14	MCL	Maximum contaminant level
15	$\mu\text{g}/\text{kg}$	Microgram per kilogram
16	$\mu\text{g}/\text{L}$	Microgram per liter
17	$\text{mg}/\text{kg}$	Milligram per kilogram
18	NAVBASE	Naval Base
19	PCE	Tetrachloroethene
20	ppb	Parts per billion
21	RBC	Risk-based concentration
22	RCRA	Resource Conservation and Recovery Act
23	RFI	RCRA Facility Investigation
24	SCDHEC	South Carolina Department of Health and Environmental Control
25	SSL	Soil screening level
26	SVOC	Semivolatile organic compound
27	TCE	Trichloroethene
28	VOC	Volatile organic compound

# 1.0 Introduction

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## 1.1 Site Description

AOC 551, Building 1119, is a boiler house that operated prior to 1942. The building appears to have undergone renovations, or it may have been demolished and a new structure rebuilt on the same site. A boiler was located onsite, but no information was found to indicate the type of fuel used in it. Building 1119 is currently vacant.

As identified in the *Final Zone E RFI Work Plan* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995), the materials of concern for AOC 551 included petroleum hydrocarbons and heavy metals. The site is zoned for industrial use (M-2). The CNC RCRA Permit identified AOC 551 as requiring a confirmatory sampling investigation (CSI).

## 1.2 Purpose of the Sampling and Analysis Plan

The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified lead and benzo[a]pyrene equivalents (BEQs) as chemicals of concern (COCs) for surface soil based on the unrestricted (i.e., residential) land use scenario. No COCs were identified for surface soil based on continued industrial land use. No COCs were identified for subsurface soil at the site. Thallium was identified as a shallow groundwater COC, and arsenic and tetrachloroethene (PCE) were identified as deep groundwater COCs for unrestricted land use.

CH2M-Jones reviewed the site data for AOCs 551 and 552 and concluded that the site is suitable for industrial land use without additional remedial actions. Land use controls (LUCs) were proposed for the site. These results were presented in the *RFI Report Addendum (RFIRA) for AOCs 551 and 552, Revision 0* (CH2M-Jones, 2002).

On October 15, 2002, the South Carolina Department of Health and Environmental Control (SCDHEC) issued comments on the RFIRA. Comment No. 2 by Mr. Jerry Stamps, and Comment No. 4 by Ms. Jo Cherie Overcash suggested that site data may be indicative of a release. Several metals were noted by the reviewers to be above typical Zone E background levels, although not above industrial risk-based concentrations (RBCs).

This Sampling and Analysis Plan (SAP) proposes to collect surface and subsurface soil samples in the area of soil boring E551SB006 in order to determine if metals concentrations (antimony, cadmium, lead, and zinc) are indicative of a release in this area.

## 1 **2.0 Proposed Samples**

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### 2 **2.1 Soil Samples**

3 Four soil borings are proposed to be advanced in the area of soil boring E551SB006. The  
4 proposed soil borings will be located approximately 10 feet to the north, south, east, and  
5 west of soil boring E551SB006. Surface and subsurface soil samples are proposed to be  
6 collected at each proposed soil boring and analyzed for select metals (antimony, cadmium,  
7 lead, and zinc) that were elevated above the Zone E background range. The locations of the  
8 proposed samples are shown in Figure 2-1.

### 9 **2.2 Groundwater Samples**

10 SCDHEC also noted (see Comment No. 8, Ms. Jo Cherie Overcash) that chlorinated volatile  
11 organic compounds (VOCs) have been detected in the deep monitoring well (E551GW02D)  
12 at AOC 551 and an upgradient grid well (GDEGW16D). The comment recommended  
13 resampling the AOC 551 deep monitoring well. CH2M-Jones agreed to resample monitoring  
14 well E551GW02D, and in this SAP proposes to collect a groundwater sample from the well.  
15 The sample will be analyzed for VOCs. The locations of site monitoring wells, including  
16 E551GW02D, are presented on Figure 2-2.

### 17 **2.3 Sample Collection and Analysis Methods**

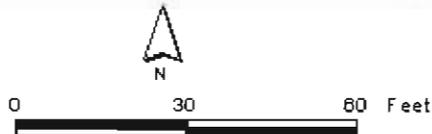
18 Sample collection and analysis will follow the procedures described in the approved  
19 Comprehensive Sampling and Analysis Plan (CSAP) portion of the *Final Comprehensive RFI*  
20 *Work Plan* (EnSafe/Allen & Hoshall, 1994). The CSAP outlines all monitoring procedures to  
21 be performed during the investigation to characterize the environmental setting, source, and  
22 releases of hazardous constituents. In addition, the CSAP includes the Quality Assurance  
23 Plan (QAP) and Data Management Plan (DMP) to verify that all information and data are  
24 valid and properly documented. Sample analysis will be performed in accordance with the  
25 guidance in EPA's *Test Methods for Evaluating Solid Waste, SW-846, Revision 4* (1996), Office of  
26 Solid Waste and Emergency Response (OSWER) and in the EPA Environmental Services  
27 Division *Laboratory Operations and Quality Control Manual* (ESDLOQCM) (1997).



NOTE: Aerial Photo Date is 1997  
 NOTE: Original figure created in color



- Monitor Well Location
- ⚡ Fence
- ⚡ Railroads
- ⚡ Roads
- ⚡ Shoreline
- ▭ AOC Boundary
- ▭ SW MU Boundary
- ▭ Buildings
- ▭ Zone Boundary



**Figure 2-2**  
 Monitor Well Locations  
 AOCs 551 and 552, Zone E  
 Charleston Naval Complex

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## 1 **3.0 References**

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- 2 CH2M-Jones. *RFI Report Addendum, AOCs 551 and 552, Zone E, Revision 0*. Charleston Naval  
3 Complex. September 2002.
- 4 CH2M-Jones. CH2M-Jones' Responses to Comments by SCDHEC regarding the *RFI Report*  
5 *Addendum, Areas of Concern 551 and 552, Zone E, Revision 0*. Charleston Naval Complex.  
6 November 27, 2002.
- 7 SCDHEC. *Comments on the RFI Report Addendum for AOCs 551 and 552, Zone E, Revision 0*.  
8 Charleston Naval Complex. October 28, 2002.
- 9 U.S. Environmental Protection Agency (EPA). *Test Methods for Evaluating Solid Waste, SW-*  
10 *846, Revision 4 (1996b)*, Office of Solid Waste and Emergency Response. 1996.
- 11 U.S. Environmental Protection Agency (EPA). *Laboratory Operations and Quality Control*  
12 *Manual (ESDLOQCM)*, Environmental Services Division. 1997.