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SAMPLING AND ANALYSIS PLAN AREA OF CONCERN 598 AND 599 (AOC 598 AND 599)
ZONE E WITH TRANSMITTAL CNC CHARLESTON SC
6/20/2002
CH2M HILL

ROC 598 and 599 Zone E
SAMPLING and ANALYSIS PLAN (RO)

CH2MHILL

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June 20, 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: Sampling and Analysis Plan for Areas of Concern 598 and 599, Zone E

Dear Mr. Scaturo:

Enclosed please find four copies of the Sampling and Analysis Plan (SAP) for Areas of Concern (AOCs) 598 and 599 in Zone E of the Charleston Naval Complex (CNC). This SAP has been prepared to complete the RCRA Facility Investigation (RFI) activities for AOCs 598 and 599 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 Sam Naik. Please contact him at (770) 604-9182, extension 255, if 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

Sampling and Analysis Plan

Areas of Concern 598 and 599, Zone E

**Charleston Naval Complex
North Charleston, SC**

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

Prepared by
CH2M-Jones

June 2002

Contract N62467-99-C-0960

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Acronyms and Abbreviations

AOC	Area of concern
BCT	BRAC Cleanup Team
BEQ	Benzo(a)pyrene equivalent
BRAC	Base Realignment and Closure Act
CNC	Charleston Naval Complex
COC	chemical of concern
COPC	chemical of potential concern
CSAP	Comprehensive Sampling and Analysis Plan
DET	Environmental Detachment Charleston
EGIS	Environmental Geographic Information System
EnSafe	EnSafe Inc.
EPA	U.S. Environmental Protection Agency
ESDSOPQAM	EPA Environmental Services Division <i>Standard Operating Procedures and Quality Assurance Manual</i>
ft bls	feet below land surface
GPS	Global Positioning System
IDW	Investigation-derived waste
IM	Interim measure
mg/kg	milligrams per kilogram
PPE	personal protective equipment
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SVOC	semivolatile organic compound

1.0 Introduction

1.1 Background

Previous investigations in the vicinity of Areas of Concern (AOCs) 598 and 599 in Zone E of the Charleston Naval Complex (CNC) have indicated the presence of numerous chemicals of concern (COCs) in soil and groundwater. CH2M-Jones has prepared this Sampling and Analysis Plan (SAP) to complete delineation of these site constituents, specifically benzo(a)pyrene equivalents (BEQs) and lead, as part of the RCRA Facility Investigation (RFI) and to provide information that can be used to make decisions regarding the need for corrective measures at this site. Figure 1-1 illustrates the location of Zone E within the CNC. Figure 1-2 is an aerial photograph of AOCs 598 and 599.

AOC 598 is a former sonar dome repair area adjacent to Pier J. It consisted of a temporary metal building on asphalt pavement. Several storm drains are located in the vicinity. The area was used to clean and repaint sonar domes and to remove adhesives, and the repair work occurred both inside and outside of the building. Currently the area is used by a boat maintenance and repair shop for cleaning and repairing boats.

AOC 599 is a former pump house on Pier J. The pump house was damaged by Hurricane Hugo in 1989. Since that time, rainwater has collected in the below-grade structure. The pump house was formerly a transfer station for diesel fuel.

1.2 Organization of the SAP

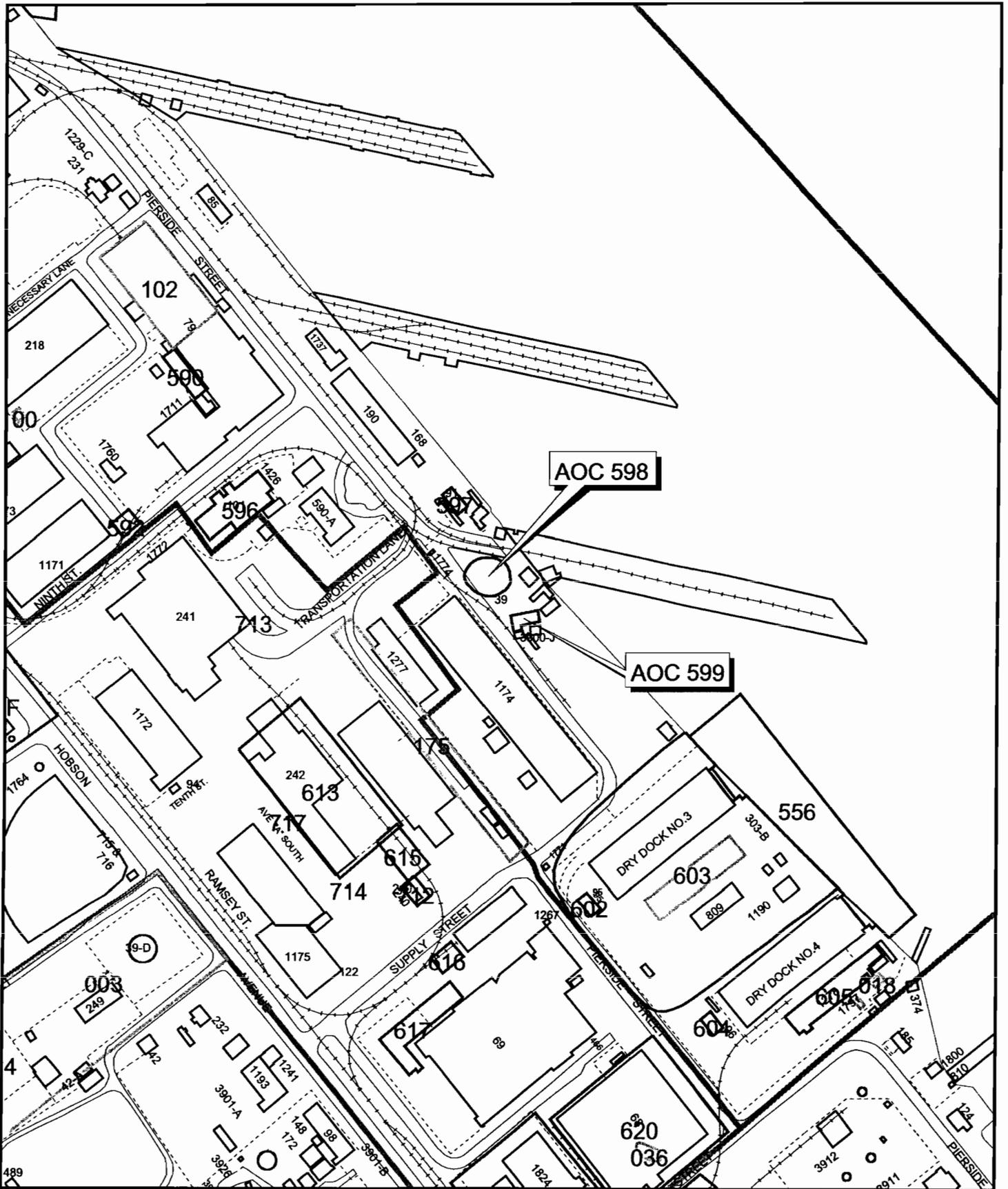
This SAP consists of the following sections, including this introductory section:

1.0 Introduction – Presents the purpose of the SAP and background information regarding the site.

2.0 Proposed Sampling and Analysis – Describes the investigative approach for delineation of chemicals of potential concern (COPCs) to complete the RFI.

3.0 References – Lists the references used in this document.

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



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

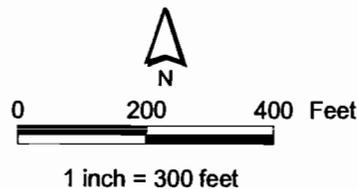


Figure 1-1
Location of AOCs 598 and 599 in Zone E
Charleston Naval Complex

NOTE: Aerial Photo Date is 1997



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary

-  Buildings
-  Zone Boundary

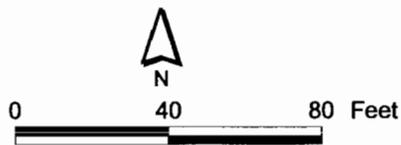


Figure 1-2
Site Map
AOC 598 and AOC 599, Zone E
Charleston Naval Complex

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2.0 Proposed Sampling and Analysis

2.1 Sampling Scope Summary

AOCs 598 and 599

Based on an evaluation of the data collected during the RFI and a comparison to COPC screening criteria currently used by the Base Realignment and Closure Act (BRAC) Cleanup Team (BCT), the locations of the exceedances of the screening criteria for surface soil were identified, as shown in Figure 2-1. In an effort to verify the current concentrations of these site constituents, surface soil samples at some of these former RFI soil boring locations will be resampled as follows:

- E598SB005 will be resampled for lead
- E598SB002 will be resampled for semivolatile organic compounds (SVOCs)
- E599SB007 will be resampled for SVOCs

Proposed soil resampling locations are shown in Figure 2-2.

One surface soil constituent—lead—requires further delineation. Additional soil borings will be installed at the proposed locations shown in Figure 2-2, and surface and subsurface soil samples will be collected for lead analyses from these new soil boring locations.

A full evaluation and presentation of the COPC screening against current criteria, as well as a COPC/COC refinement analysis, will be provided in an RFI report addendum after collection and analyses of the samples proposed herein.

2.2 Sampling and Analysis Plan

All investigative work will be performed in accordance with the Comprehensive Sampling and Analysis Plan (CSAP) portion of the *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995).

Surface and Subsurface Soils

Surface and subsurface soil samples will be collected for laboratory analyses at the locations shown in Figure 2-2 to delineate the nature and extent of contamination. The analyses to be performed on these samples are presented in Table 2-1.

1 The soil samples will be collected using hand augers and the sampling will be performed in
2 accordance with the procedures outlined in the document *Environmental Services Division*
3 *Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM) (U.S.
4 Environmental Protection Agency [EPA], 1996).

5 For new sample locations, samples will be collected from the following depths:

- 6 • 0 to 1 foot below land surface (ft bls) (below any pavement present)
- 7 • 3 to 5 ft bls

8 For existing sample locations, samples will be collected from the following depth:

- 9 • 0 to 1 ft bls (below any pavement present)

10 **Groundwater**

11 No constituents were identified for further delineation in groundwater in the vicinity of
12 AOCs 598 and 599.

13 **Sediment**

14 The sediments that were present in the three storm drains at AOCs 598 and 599 were
15 removed during an Interim Measure (IM) for AOC 699 conducted by the Environmental
16 Detachment Charleston (DET) in 1998. As a result, these sediments are no longer present at
17 this site and no further investigation is necessary for these storm drains.

18 **2.3 Health and Safety**

19 CH2M-Jones places significant emphasis on the health and safety of our personnel, our
20 subcontractors, and the local community. Once all personnel have arrived on site as part of
21 the mobilization phase of the SAP, a project briefing and health and safety orientation
22 meeting will be held. All work completed as part of this SAP will be performed in
23 accordance with the CH2M-Jones Site-Specific Health and Safety Plan (CH2M-Jones, 2000).

24 Personnel working at the site will be required to comply with Level D personal protective
25 equipment (PPE) requirements, as specified in the Health and Safety Plan.

26 **2.4 Site Clearance**

27 Soil boring locations will be marked or staked in the field using previously surveyed
28 coordinates stored in the CNC Environmental Geographic Information System (EGIS) tool
29 and utilizing the Global Positioning System (GPS) equipment. Table 2-2 shows the
30 coordinates for the proposed and historical soil sampling locations.

- 1 To prepare for the start of onsite operations, CH2M-Jones will notify the necessary agencies
2 and departments regarding planned activities at the project site.
- 3 CH2M-Jones will examine the site for existing water, electrical, natural gas, telephone, and
4 other utility lines that are potential hazards at the site. Utilities will be clearly marked and
5 identified.

6 **2.5 Waste Management and Disposal**

- 7 Four waste streams will be generated as part of this SAP: pavement debris, soil cuttings,
8 decontamination wastes, and used PPE. Soil cuttings will be drummed and characterized in
9 accordance with South Carolina Hazardous Waste Management Regulations (South
10 Carolina Department of Health and Environmental Control [SCDHEC] R.61-79.261) and
11 disposed in accordance with all applicable regulations and permits. Decontamination
12 wastes and used PPE will also be disposed in accordance with applicable regulations.
- 13 Pavement debris will be transported offsite for disposal. Offsite transportation and disposal
14 will be performed by properly permitted and licensed subcontractors.

15 **2.6 Equipment Decontamination**

- 16 Decontamination of personnel, sampling and removal equipment, and materials will be in
17 accordance with the CH2M-Jones Site-Specific Project Health and Safety Plan.

1

TABLE 2-1
 Analytical Summary for Supplemental Sampling Activities
 Sampling and Analysis Plan, AOC 598 and AOC 599, Zone E, Charleston Naval Complex

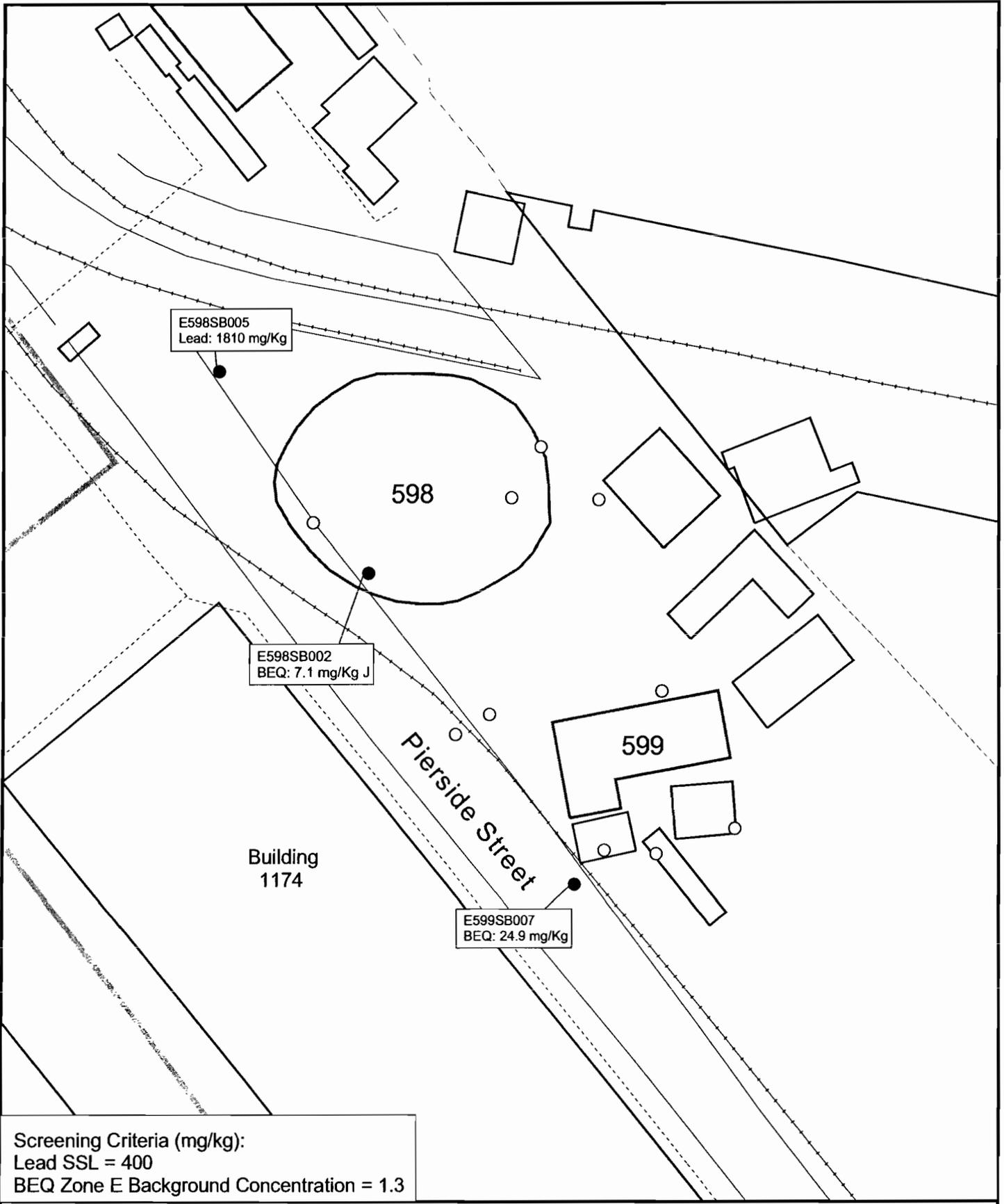
New Sample ID	Number of Sample Locations	Analytes	Analytical Methods
Surface and Subsurface Soils – Nature and Extent			
E598SB005 (for lead)	1 location, with depth interval (0–1 ft bls)	Total lead	SW-846 6010
E598SB007 (for lead)	1 location, with 2 depth intervals (0–1 ft bls, and 3–5 ft bls)	Total lead	SW-846 6010
E598SB008 (for lead)	1 location, with 2 depth intervals (0–1 ft bls, and 3–5 ft bls)	Total lead	SW-846 6010
E598SB009 (for lead)	1 location, with 2 depth intervals (0–1 ft bls, and 3–5 ft bls)	Total lead	SW-846 6010
E598SB002 (for BEQs)	1 location, with depth interval (0–1 ft bls)	SVOCs	SW-846 8270
E599SB007 (for BEQs)	1 location, with depth interval (0–1 ft bls)	SVOCs	SW-846 8270

2

TABLE 2-2
 Coordinates for Proposed Sampling Locations
 Sampling and Analysis Plan, AOCs 598 and 599, Zone E, Charleston Naval Complex

New Sample ID	Northing	Easting
Historic RFI Soil Borings to be Resampled		
E598SB002	374,344	2,319,822
E598SB005	374,419	2,319,766
E599SB007	374,229	2,319,900
New Soil Borings to be Sampled		
E598SB007	374,407	2,319,772
E598SB008	374,426	2,319,748
E598SB009	374,428	2,319,775

3



- Surface Soil Exceedance
- Surface Soil Non-exceedance
- - - Fence
- - - Railroads
- - - Roads
- - - Shoreline
- AOC Boundary
- SWMU Boundary
- Buildings
- Zone Boundary

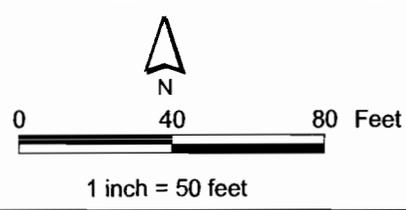


Figure 2-1
 Surface Soil Exceedances
 AOC 598 and AOC 599, Zone E
 Charleston Naval Complex

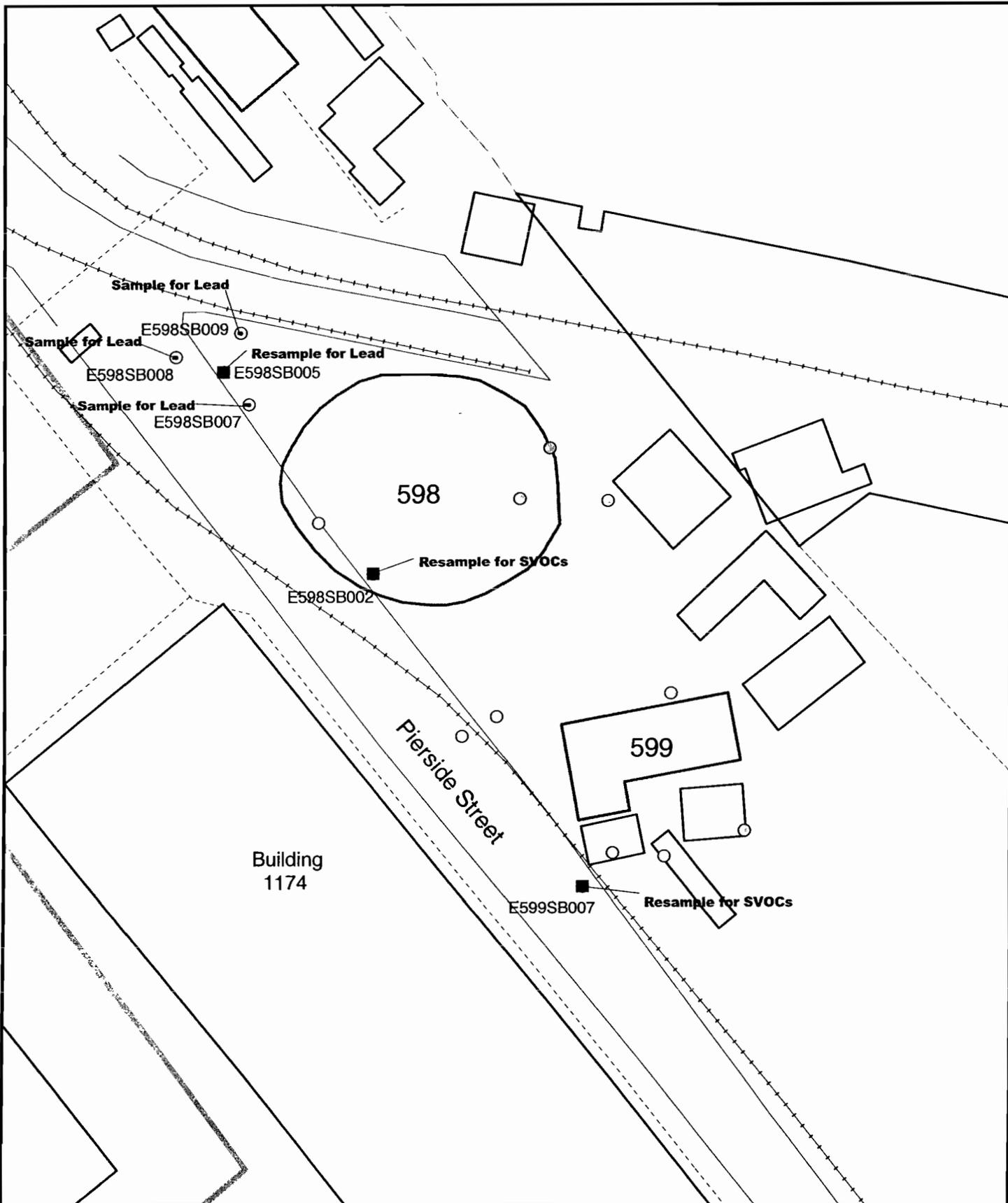


Figure 2-2
 Proposed Soil Sampling Locations
 AOC 598 and AOC 599, Zone E
 Charleston Naval Complex

■	Proposed Soil Resampling Location		
⊙	Proposed Soil Sampling Location		
○	RFI Soil Sampling Location		
- - -	Fence		
~	Shoreline		
⋯	Zone Boundary		
- - -	Railroads		
—	Roads		
▭	Buildings		

1 inch = 50 feet

1 **3.0 References**

2 EnSafe Inc./Allen & Hoshall. *Final Zone E RFI Work Plan, Revision 1. Naval Base Charleston.*
3 June 1995.

4 U.S. Naval Detachment. *Interim Measure Completion Report for AOC 699 Storm Drain Cleaning.*
5 March 1999.

6 U.S. Environmental Protection Agency (EPA). *Environmental Services Division Standard*
7 *Operating Procedures and Quality Assurance Manual (ESDSOPQAM).* 1996.