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CNC CHARLESTON
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SOIL SAMPLING PLAN COMBINED SOLID WASTE MANAGEMENT UNIT 14 (SWMU 14) ZONE H WITH TRANSMITTAL CNC CHARLESTON SC

9/26/2001

CH2M HILL

COMBINED SCHEME 14 ZONE H

SOIL SAMPLING PLAN (RO)

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CH2MHILL

September 26, 2001

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

Re: Soil Sampling Plan for Combined SWMU 14, Zone H

Dear Mr. Scaturo:

Enclosed please find four copies of the Soil Sampling Plan for Combined SWMU 14 in Zone H of the Charleston Naval Complex (CNC). This Sampling Plan has been prepared to confirm the required extent of soil excavation for benzo(a)pyrene equivalents (BEQs) in soils at the site. This information will be used to complete RFI activities at the site.

The principal author of this Sampling Plan 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
Darryl Gates/CH2M HILL, w/att

Sampling Plan

Combined SWMU 14, Zone H

Charleston Naval Complex
North Charleston, SC

Prepared for

U.S. Navy Southern Division
Naval Facilities Engineering Command

Prepared by

CH2M-Jones

September 2001

Contract N62467-99-C-0960

RFI Report Addendum Soil Sampling Plan
Combined SWMU 14, Zone H

Purpose of the Soil Sampling Plan

This sampling plan describes additional sampling activities proposed at Combined Solid Waste Management Unit (SWMU) 14 in Zone H of the Charleston Naval Complex (CNC). The information obtained from this investigation will be used to confirm the required extent of soil excavation for benzo(a)pyrene equivalents (BEQs) in soils near the location of a former outdoor trap and skeet range.

Combined SWMU 14 is located in the eastern portion of Zone H at the CNC. The Combined SWMU 14 area encompasses SWMU 14, SWMU 15, Area of Concern (AOC) 670, and AOC 684. The locations of these SWMUs and AOCs are shown in Figure 1-1. The Combined SWMU 14 site is mostly unpaved. Figure 1-2 shows the RFI sample locations, and Figure 1-3 shows surface soil locations that indicate the presence of COCs.

Proposed Soil Sampling

An IM Work Plan was prepared by CH2M-Jones (2001) and submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) for review. This IM Work Plan proposed excavation of surface soils within a 10 ft x 10 ft footprint around those RFI soil boring locations that showed the presence of COCs at concentrations above screening goals. These RFI soil boring locations are shown in Figure 1-3. The IM Work Plan proposed collection of four surface soil delineation samples outside the 10 ft x 10 ft footprint prior to excavation, in order to determine the presence of COCs outside the proposed excavation footprints.

Figure 1-4 shows delineation sample locations collected during August 2001 for this IM. At several of the delineation sampling locations, analytical results indicate the presence of COCs at concentrations above screening goals. Figure 1-5 shows delineation sample locations where at least one of the COCs showed exceedance of the screening goals.

In the area south of SWMU 15 within the Combined SWMU 14 area, where the primary COCs are BEQs, the majority of the delineation samples showed an exceedance of the surface soil BEQ reference concentration of 1,304 micrograms per kilogram (µg/kg). While the exceedances of the reference concentration in the IM delineation samples in other areas

of Combined SWMU 14 are isolated, BEQ contamination in this area (shown as Area 1 in Figure 1-6) does not appear to occur as isolated hotspots, but appears to be area-wide. The elevated BEQ concentrations in surface soil samples in this area could perhaps be due to fragments of targets used in the trap and skeet range that have been entrained in the surface soils.

An area north of Building 1896 on the northern boundary of AOC 670 (shown as Area 2 in Figure 1-6) also showed elevated BEQ concentrations during the IM delineation sampling. These BEQ concentrations may be attributed to the presence of total petroleum hydrocarbons (TPH) which were detected in the subsurface soil samples in this area during the RFI.

Assessment of Depth of BEQ Contamination in Surface Soil

In an effort to investigate the vertical distribution of BEQs in the surface soils in the 0 to 1 ft interval below land surface (bls), one of the four delineation sample locations at each original RFI boring location will be chosen for re-sampling. There are six such re-sampling locations proposed to be collected within Area 1. At each re-sampling location, two samples will be collected: one from the 0 to 6 inches bls interval and one from the 6 to 12 inches bls interval.

In addition, one of the delineation sampling locations around RFI soil boring H684SB015 will be chosen for re-sampling for BEQs.

Analytical results from the re-sampling will be evaluated to identify if a vertical distribution pattern for the presence of BEQs is evident. Based on the vertical distribution of BEQs in Area 1, the soil excavation approach at Area 1 will be determined. If the samples indicate that BEQ contamination is not present in the 6 to 12 inch bls interval, the surface soil in this area will be excavated out to approximately 6 inches bls.

The sampling, sample preservation and shipping, and sampling documentation will be conducted in accordance with the procedures outlined in the approved Comprehensive Sampling and Analysis Plan (CSAP) portion of the final Comprehensive RFI Work Plan (EnSafe/Allen & Hoshall, 1994), and the EPA Environmental Services Division *Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM) (1996a).

Soil Sample Analysis

Soil samples collected during this effort will be delivered by hand or via an overnight carrier to an offsite laboratory for chemical analysis. The samples will be analyzed for semivolatile organic compounds (SVOCs) by EPA Method SW-846-8270, at data quality objective (DQO) level III. Sample analyses will be conducted in accordance with the CSAP, the guidance in EPA's *Test Methods for Evaluating Solid Waste*, SW-846, 3rd Ed., Office of Solid Waste and Emergency Response (OSWER) (1996b), and in the EPA Environmental Services *Division Laboratory Operations and Quality Control Manual* (ESDLOQCM) (1997).

Table 1 presents a listing of proposed sample station locations, sample identification numbers, sampling intervals, and target analytical parameters for analysis.

Data Presentation

The results of the additional soil investigation will be summarized and presented in an IM Completion Report, which will be submitted as part of the RFI Report Addendum for Combined SWMU 14. The IM Completion Report/RFI Report Addendum will document the field activities conducted during this investigation, and will provide the analytical results for the soil samples collected by CH2M-Jones.

Investigation-Derived Waste (IDW)

Sampling equipment will be pre-cleaned prior to use, in accordance with the CSAP and ESDSOPQAM, and will be cleaned in the field if necessary. All field-generated decontamination solvents/rinse water/adhered soil rinsates will be containerized in a labeled 55-gallon drum for analysis and proper disposal. The drum contents will be sampled for waste characterization analyses, after which they will be transported to the RCRA less–than-90-day hazardous waste storage area in Building 1846 at the CNC until results are received. Personal Protective Equipment (PPE) from sampling will also be containerized for proper disposal through the CH2M-Jones field office. Excess native soil cuttings removed from borings during sampling will be used to backfill the borehole.

References

CH2M-Jones. *Interim Measure Work Plan, Combined SWMU 14, Zone H, Charleston Naval Complex*. May 2001.

EnSafe Inc. *Zone H RFI Report, NAVBASE Charleston*. July 1996 with updates of June 24, 1997 and June 18, 1998.

EnSafe Inc./Allen & Hoshall. *Final Comprehensive RFI Work Plan*. 1994.

U.S. Environmental Protection Agency. *Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM). 1996a.

U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response (SW846). *Test Methods for Evaluating Solid Waste, SW-846*. Revision 4. December 1996b.

U.S. Environmental Protection Agency. *Laboratory Operations and Quality Control Manual* (ESDLOQCM). 1997.

TABLE 1
BEQ Vertical Delineation Sampling, Area 1
Soil Sampling Plan, Combined SWMU 14, Zone H

Vertical Delineation Sample ID	Depth (ft bls)	RFI Sampling Location ID	Comments
684SB11703	0-0.5	H684SB015N - Vertical 0-0.5	Northwest of pre-excavation sampling location
684SB11704	0.5-1	H684SB015N - Vertical 0.5-1	Northwest of pre-excavation sampling location
684SB11803	0-0.5	H684SB035W - Vertical 0-0.5	West of pre-excavation sampling location
684SB11804	0 5-1	H684SB035W - Vertical 0.5-1	West of pre-excavation sampling location
684SB11803	0-0.5	H684SB043S - Vertical 0-0.5	South of pre-excavation sampling location
684SB11804	0.5-1	H684SB043S - Vertical 0.5-1	South of pre-excavation sampling location
670SB07203	0-0.5	H670SB034NN- Vertical 0-0.5	New sampling location
670SB07204	0.5-1	H670SB034NN - Vertical 0.5-1	New sampling location
684SB11903	0-0.5	H684SB044W - Vertical 0-0.5	West of pre-excavation sampling location
684SB11904	0.5-1	H684SB044W - Vertical 0.5-1	West of pre-excavation sampling location
670SB07303	0-0.5	H670SB031W - Vertical 0-0.5	West of pre-excavation sampling location
670SB07304	0.5-1	H670SB031W - Vertical 0.5-1	West of pre-excavation sampling location
670SB07403	0-0.5	H670SB003N - Vertical 0-0.5	North of pre-excavation sampling location
670SB07404	0.5-1	H670SB003N - Vertical 0.5-1	North of pre-excavation sampling location

AOC Boundary
SWMU Boundary
Buildings
Zone Boundary

N

0 100 200 Feet

Note: Original figure produced in color.
Aerial photograph dated 1996.

Figure 1-1
Site Location
Combined SWMU 14, Zone H
Charleston Naval Complex

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File Path c:\18gis\cnc\cnc-egis.apr, Date 14 May 2001 16:03, User SNAIK1

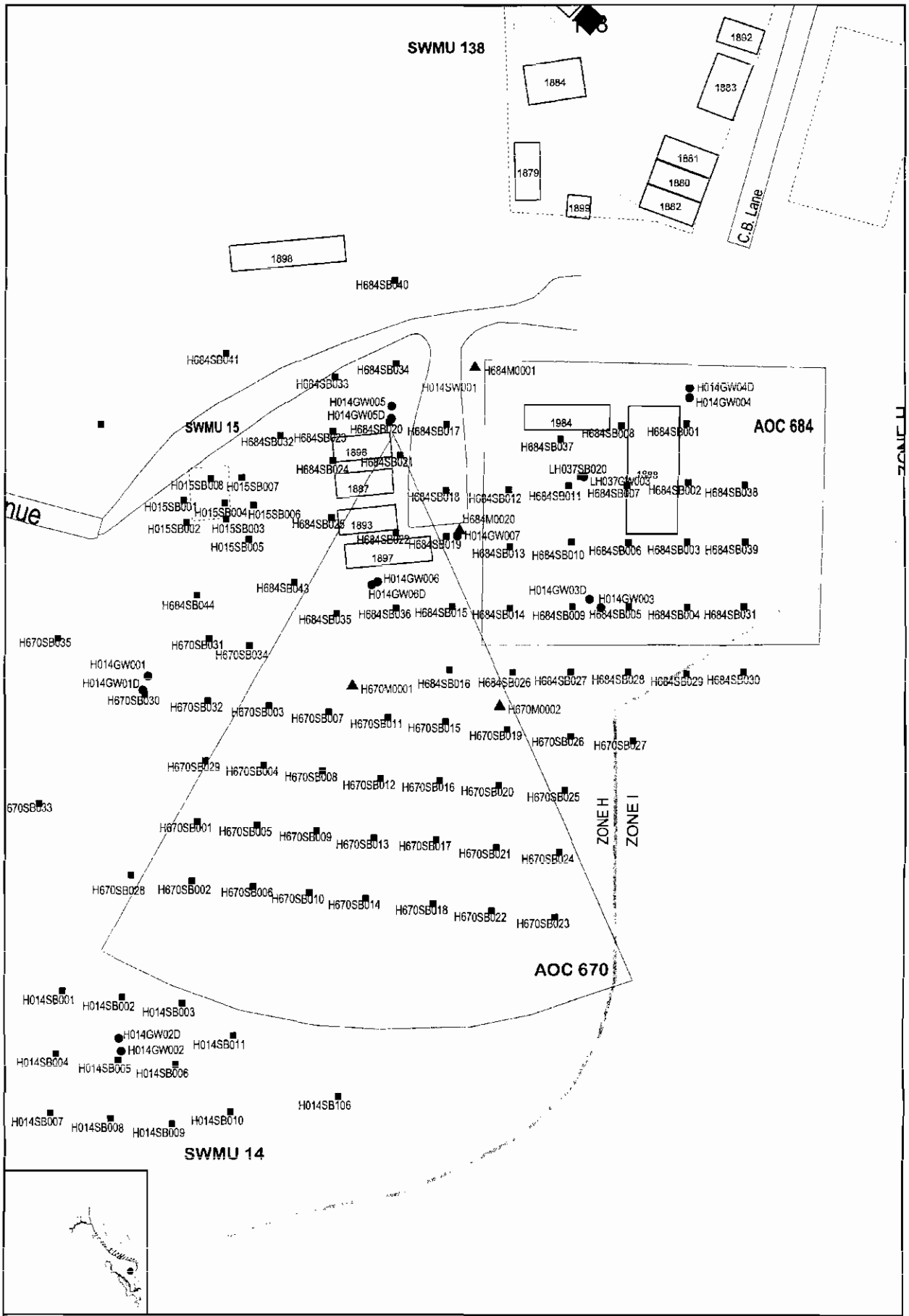

Figure 1-2
RFI Sampling Locations
Combined SWMU 14
Charleston Naval Complex

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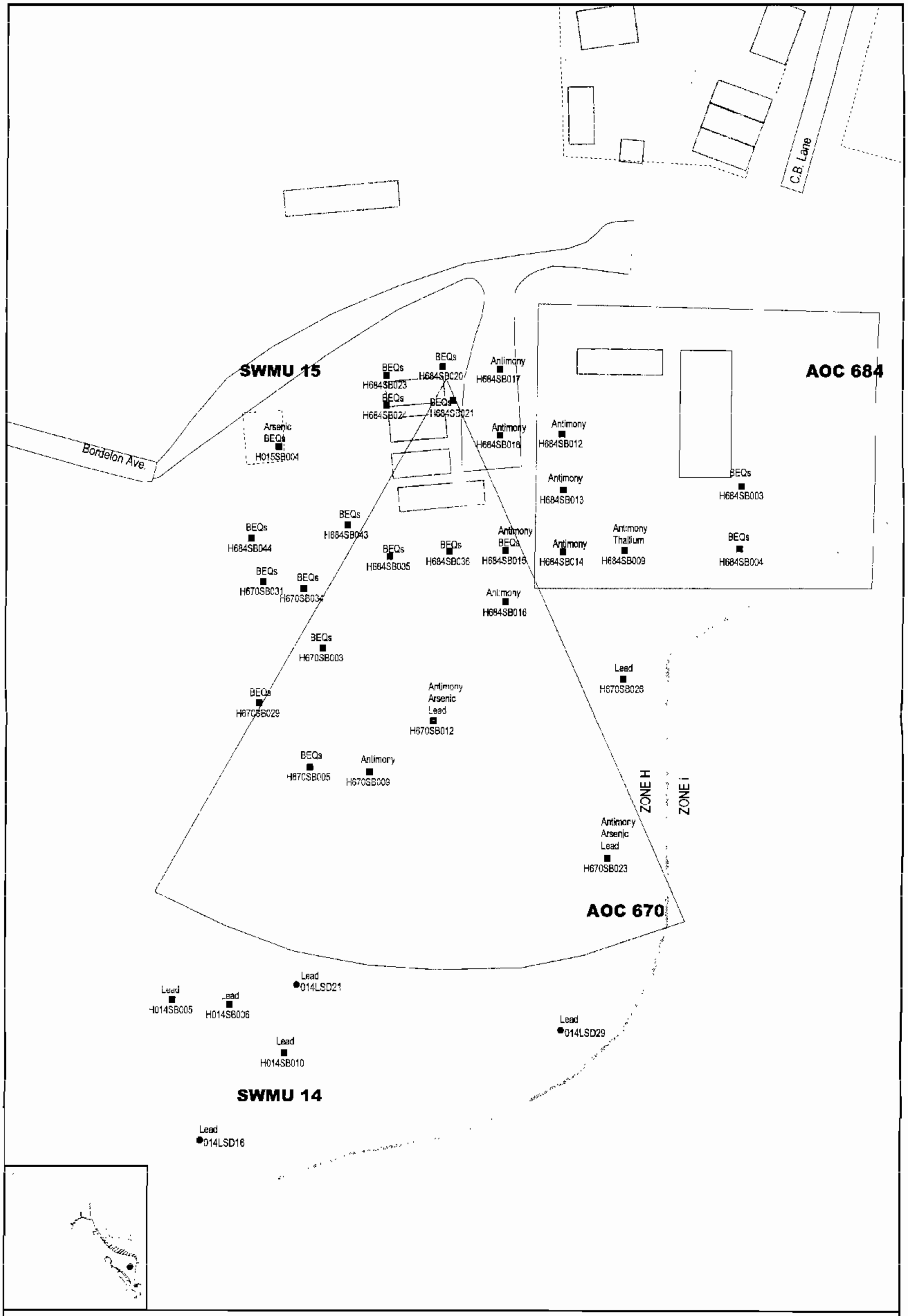

SWMU 15
AOC 684
AOC 670
SWMU 14
Bordelon Ave.
C.B. Lane
ZONE H
ZONE I
BEQs
H684SB023
BEQs
H684SB020
Antimony
H684SB017
BEQs
H684SB024
BEQs
H684SB021
Arsenic
BEQs
H015SB004
Antimony
H684SB018
Antimony
H684SB012
Antimony
H684SB013
BEQs
H684SB003
BEQs
H684SB043
BEQs
H684SB044
BEQs
H684SB035
BEQs
H684SB036
Antimony
BEQs
H684SB015
Antimony
H684SB014
Antimony
Thallium
H684SB009
BEQs
H684SB004
BEQs
H670SB031
BEQs
H670SB034
Antimony
H684SB016
BEQs
H670SB003
Lead
H670SB026
BEQs
H670SB029
Antimony
Arsenic
Lead
H670SB012
BEQs
H670SB005
Antimony
H670SB009
Antimony
Arsenic
Lead
H670SB023
Lead
014LSD21
Lead
H014SB005
Lead
H014SB006
Lead
014LSD29
Lead
H014SB010
Lead
014LSD16

Soil Sampling Location
H684SB039 Soil Boring ID
Lead Shot Dist. Sampl. Location
AOC Boundary
SWMU Boundary
Buildings
Zone Boundary

Note: Original figure produced in color.

N

0 60 120 Feet

Figure 1-3
Soil COCs and Proposed IM Removal Locations
Combined SWMU 14, Zone H
Charleston Naval Complex

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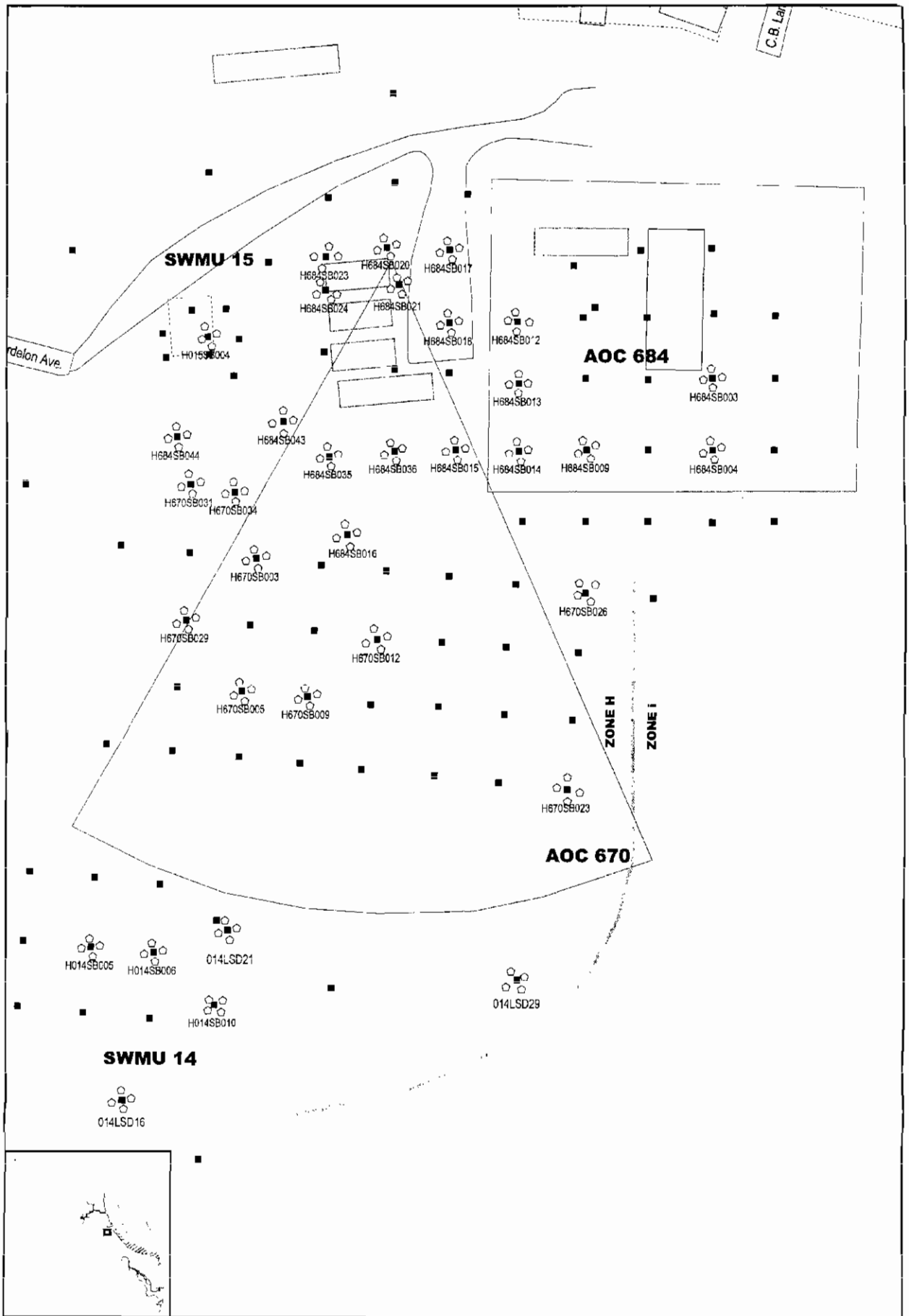

Figure 1-4
Pre-Excavation Delineation
Sampling Locations
Interim Measure, SWMU 14, Zone H
Charleston Naval Complex

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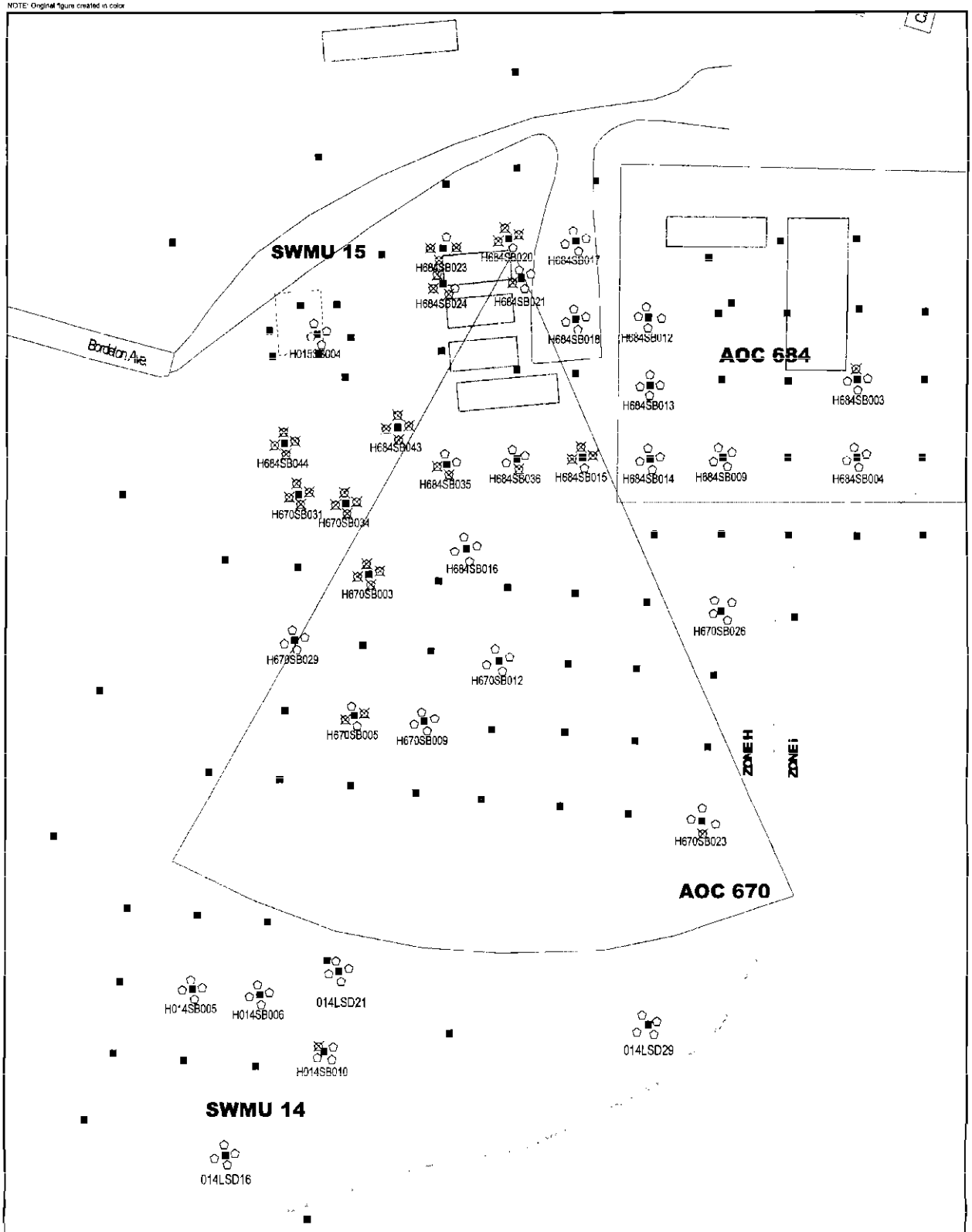
NOTE: Original figure created in color



Pre-excavation Delineation Sampling Location (May 2001)

Delineation Sampling Location with Exceedance of Screening Goal

RFI Soil Sampling Location

Roads - Lines

AOC Boundary

SWMU Boundary

Buildings

Zone Boundary

N

0 50 100 Feet

1 inch = 68 feet

Figure 1-5
Pre-Excavation Delineation Locations with Exceedances of Screening Goals
Charleston Naval Complex

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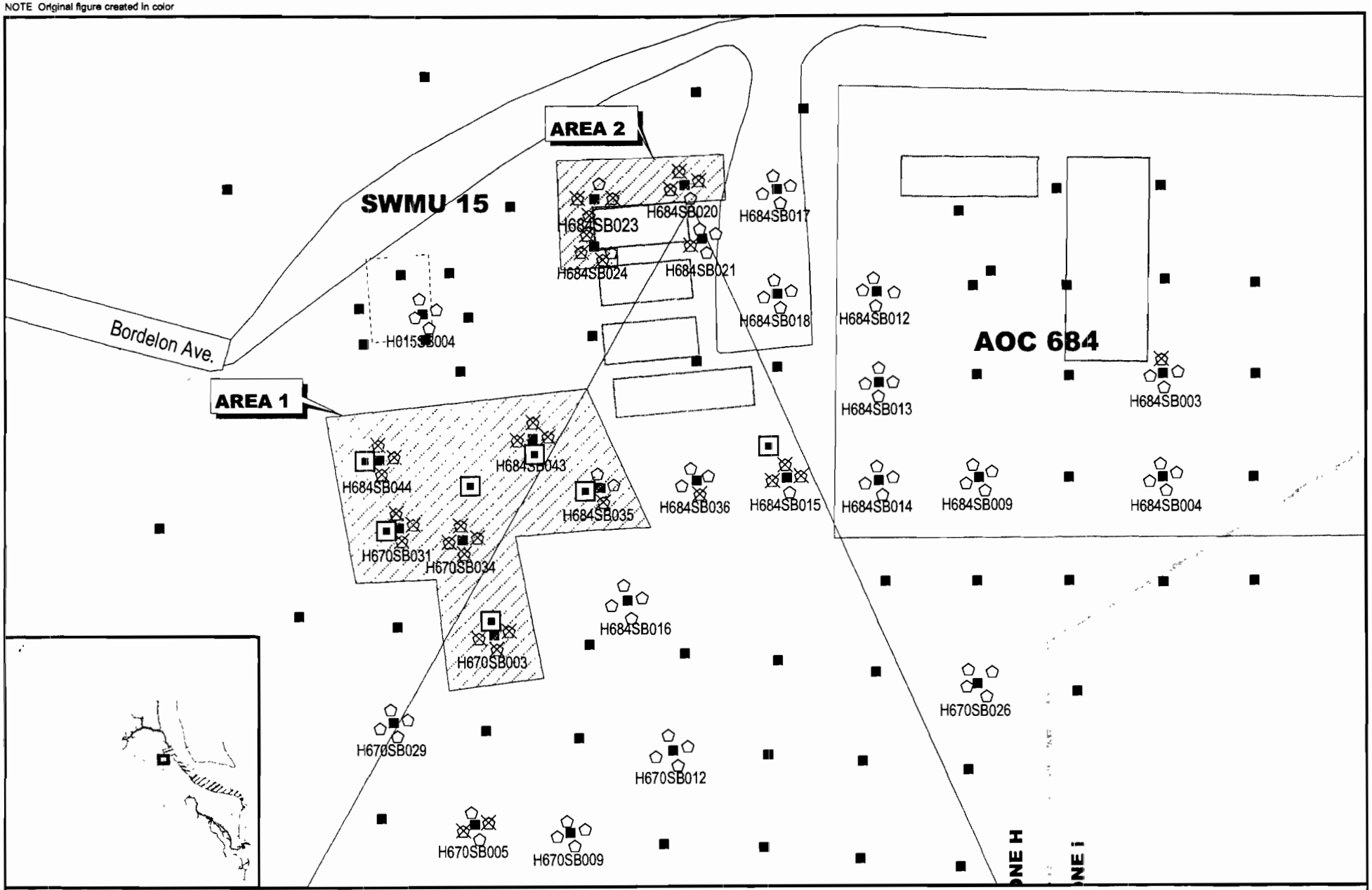
NOTE Original figure created in color



Pre-excavation Delineation Sampling Location (May 2001)

Delineation Sampling Location with Exceedance of Screening Goal

RFI Soil Sampling Location

Vertical Delineation Test Area (Area 1)

Vertical Delineation Sampling Location

Buildings

Zone Boundary

AOC Boundary

SWMU Boundary

N

0 40 80 Feet

1 inch = 71 feet

Figure 1-6
BEQ Vertical Delineation Sampling Locations
SWMU 14, Zone H
Charleston Naval Complex

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