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SAMPLING AND ANALYSIS PLAN ADDENDUM AREA OF CONCERN 638 AND 636 (AOC
638 AND 636) ZONE G CNC CHARLESTON SC
6/1/2001
CH2M HILL

DOC 636 & 638
SAMPLING PLAN

Zone 9



CH2MHILL

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June 29, 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: Sampling Plans for AOCs 638 and 636, Zone G

Dear Mr. Scaturo:

Enclosed please find four copies each of the Sampling Plans for AOCs 638 and 636, Zone G of the Charleston Naval Complex (CNC). These Sampling Plans have been prepared to gain further information for evaluating the nature of the soil. This information will be used to complete RFI activities at the site.

Please contact me 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

AOC 638, Zone G

**Charleston Naval Complex
North Charleston, SC**

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

Prepared by

CH2M-Jones

June 2001

Contract N62467-99-C-0960

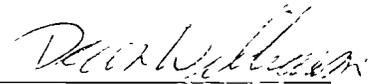
Certification Page for RCRA Facility Investigation (RFI) Addendum Soil Sampling Plan – AOC 638, Zone G

Surface Soil Investigation

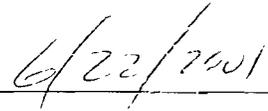
I, Dean Williamson, certify that this report has been prepared under my direct supervision. The data and information are, to the best of my knowledge, accurate and correct, and the report has been prepared in accordance with current standards of practice for engineering.

South Carolina

Temporary Permit No. T2000342



Dean Williamson, P.E.



Date



RFI Addendum Soil Sampling Plan

AOC 638, Zone G

Introduction

Purpose of the Soil Sampling Investigation

This Sampling Plan describes the proposed further delineation of arsenic in surface soil at Area of Concern (AOC) 638, Zone G, at the Charleston Naval Complex (CNC). The information obtained from this investigation activity will be used to evaluate the nature and extent of arsenic in surface soil at the site.

Site Background and Setting

AOC 638 consists of a concrete block building with a sheet metal roof (Building 132) located at the corner of Brumby Street and Hobson Avenue. The building was a torpedo workshop from 1944 to 1991. From 1991 to 1995, the building was used by the Public Works Department to store equipment, parts, and flammable materials. The building is now vacant.

Previous Soil Investigations

RFI

As part of the Zone G RFI (EnSafe, 1998), soil and groundwater investigations were conducted by EnSafe in the area of Building 132, the former torpedo workshop. Initially, soil borings were made to collect and analyze four surface soil and three subsurface soil samples to determine if there was any impact from the workshop to surrounding soil. No organic or inorganic chemicals in soil were detected above the RFI screening criteria (residential risk-based concentrations [RBCs], soil screening levels [SSLs], and background reference concentrations [BRCs]). There were no chemicals of potential concern (COPCs) identified in surface soils, subsurface soils, or groundwater for this site.

Additional Investigations

During the latter part of 1999 and early 2000, additional field activities were conducted by EnSafe in soil to estimate leachability of metals in the soil (synthetic precipitation leaching procedure [SPLP]) and to delineate benzo(a)pyrene equivalents (BEQs) and copper. Five samples were analyzed for metals (638SB005 through 638SB009) at locations shown in Figure 1-1. Arsenic was detected in all five surface soil samples. Of these, two surface sample locations (G638SB005: 45.1 milligrams per kilogram [mg/kg] and G638SB007: 24.5

mg/kg) reported arsenic concentrations above the residential RBC concentration (0.43 mg/kg) and Zone G BRC (17.2 mg/kg). The range of arsenic in the background surface soil in Zone G is 3.1 to 25 mg/kg. Site groundwater does not have elevated levels of arsenic. Therefore, it is likely that the detected arsenic is part of the area background concentration. Additional sampling will clarify the arsenic concentrations and distribution in this area.

Proposed Sampling

This section prescribes the proposed sampling for arsenic in surface soil at AOC 638. The test results will be presented in an RFI Report Addendum report in conjunction with the results from additional investigation activities completed by EnSafe in early 2000. The results will be evaluated to determine if corrective measures are necessary at AOC 638.

Hand Auger Investigation

To further evaluate the nature and extent of arsenic at AOC 638, two (2) hand auger (HA) borings, identified as G638HA001 and G638HA002, will be advanced by CH2M-Jones at the two locations shown on Figure 1-1. Stainless-steel hand augers will be used to collect surface soil samples from the 0 to 1 foot below land surface (ft bls) interval.

The sampling strategy and procedures will be performed in accordance with the Environmental Services Division *Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM) (U.S. Environmental Protection Agency [EPA], 1996a).

The completed HA locations will be filled with excess cuttings, and the pavement replaced with bituminous cold patch or concrete flush with the surface. Locations will be surveyed for positioning in the CNC geographic information system (GIS).

Surface Soil Analysis

The two (2) surface soil samples collected from the HA locations will be delivered or sent via overnight carrier to an offsite laboratory, where they will be analyzed for arsenic using EPA Method SW846-6010. The surface soil analysis will follow the procedures provided in the approved Comprehensive Sampling and Analysis Plan (CSAP) portion of the *Final Comprehensive RFI Work Plan* (EnSafe/Allen & Hoshall, 1994). The CSAP outlines all monitoring procedures to be performed during the investigation to characterize the environmental setting, source, and releases of hazardous constituents. In addition, the CSAP includes the Quality Assurance Plan (QAP) and Data Management Plan (DMP) to verify that all information and data are valid and properly documented. Sample analysis will be conducted in accordance with the guidance in the EPA's *Test Methods for Evaluating*

Solid Waste, SW-846, Revision 4, Office of Solid Waste and Emergency Response (SW846) (1996b) and in the EPA Environmental Services Division *Laboratory Operations and Quality Control Manual* (ESDLOQCM) (1997).

Data Presentation

The results of the surface soil investigation will be summarized in an RFI Report Addendum for AOC 638. The RFI Report Addendum will document the field activities completed during the investigation and provide the analytical results from the samples collected from the HA locations.

Investigation-Derived Waste (IDW)

IDW consisting of residual soil and decontamination water from the HA locations will be collected in a labeled 55-gallon drum and hauled from the site to Building 1846 located on the CNC. Building 1846 is a RCRA less-than-90-day hazardous waste accumulation area. A sample of the drum contents will be collected and analyzed for arsenic. CH2M-Jones will arrange for transporting the drum and its contents to an offsite, licensed facility that is permitted to accept and treat arsenic-impacted soil, if necessary.

References

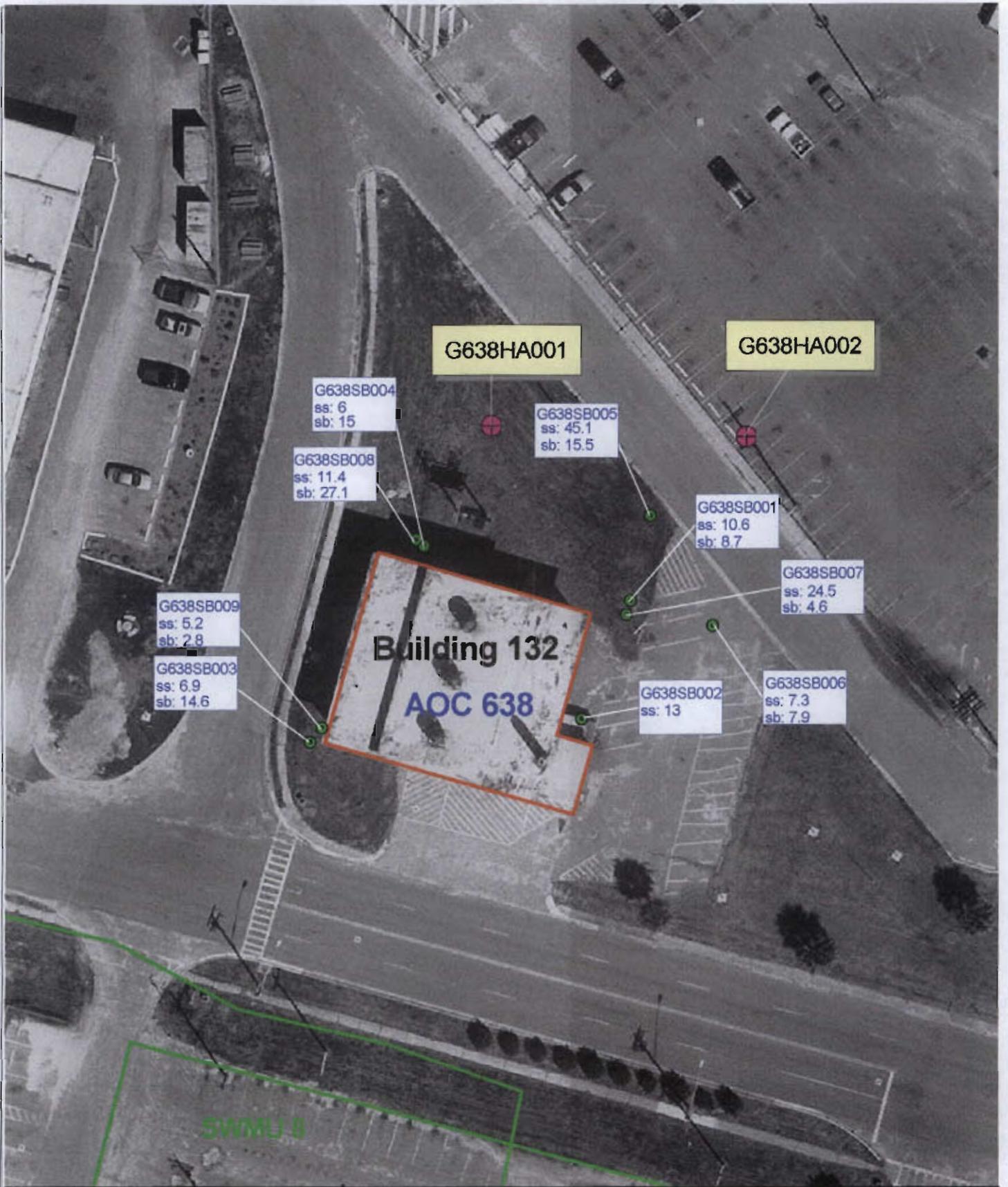
EnSafe Inc. *Zone G RFI Report, NAVBASE Charleston*. Revision 0. February 20, 1998.

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

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

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



G638HA001

G638HA002

G638SB004
ss: 6
sb: 15

G638SB005
ss: 45.1
sb: 15.5

G638SB008
ss: 11.4
sb: 27.1

G638SB001
ss: 10.6
sb: 8.7

G638SB007
ss: 24.5
sb: 4.6

G638SB009
ss: 5.2
sb: 2.8

G638SB003
ss: 6.9
sb: 14.6

Building 132
AOC 638

G638SB002
ss: 13

G638SB006
ss: 7.3
sb: 7.9

SWMU 9

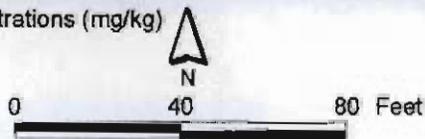
● Existing Boring Location with arsenic concentrations (mg/kg)

● Proposed Hand Auger Locations

SS = Surface Soil

SB = Subsurface Soil

□ SWMU Boundary □ AOC Boundary



Surface Soil Arsenic Background Concentration Range from 3.1 to 25 mg/kg

Subsurface Soil Arsenic Background Concentration Range from 1.4 to 36 mg/kg

Figure 1-1

RFI and Additional Arsenic Results (mg/kg)
and Proposed Sample Locations

AOC 638 - Zone G
Charleston Naval Complex

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