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FOCUSED FIELD INVESTIGATION STATE DEPARTMENT COMPLEX CNC CHARLESTON SC

1/26/1994
ENSAFE

FOCUSED FIELD INVESTIGATION
STATE DEPARTMENT COMPLEX
NAVAL BASE, CHARLESTON, SC

Prepared for:

Naval Base Charleston
Charleston, South Carolina

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Southern Division
Naval Facilities Engineering Command
Charleston, South Carolina

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Table of Contents

BACKGROUND 1

CURRENT INVESTIGATIONS 1

GEOTECHNICAL SETTING 3

HYDROGEOLOGIC SETTING 4

RECENT DEVELOPMENTS 4

FOCUSED INVESTIGATION 4

FIELD INVESTIGATION 6
- Building Surveys 6
- Indoor Air Quality Study 7
- Soil-Gas Survey 8
- Soil-Gas Sample Collectors 8
- Soil and Groundwater Study 9
- Risk Assessment 10

COMMUNITY RELATIONS PROGRAM 11

SCHEDULE 11

List of Figures

Figure 1 Area of Focused Field Investigation 2
Figure 2 Preliminary Potentiometric Surface Map 5
Figure 3 Focused Field Investigation 12

List of Tables

Table 1 Potential Areas of Concern State Department Complex Vicinity 3

List of Appendices

Appendix A Community Relations Stepped Approach

FOCUSED FIELD INVESTIGATION
STATE DEPARTMENT COMPLEX
NAVAL BASE CHARLESTON, SC

BACKGROUND

Congressional passage of House Rule 3116 authorized the 01 January 1994 transfer of the Fleet Warfare Training Center building complex at Naval Base Charleston to the US Department of State. The complex (Buildings 643, 645, 646/646A, 647 and 649) is bounded by Dyess Ave., Proteus St., Bainbridge Ave. and Holland St.

CURRENT INVESTIGATIONS

Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) is currently conducting a RCRA Facility Investigation (RFI) at Naval Base Charleston. These Solid Waste Management Units (SWMUs) are located in the vicinity of the building complex being transferred to the State Department:

- SWMU 9 — a 60-year old solid waste landfill;
- SWMU 13 — a fire-fighter training facility;
- SWMU 14 — a former chemical disposal area;
- SWMU 15 — a classified document incinerator;
- SWMU 17 — a submarine training center;
- SWMU 19 — a solid waste transfer station; and
- SWMU 20 — a former waste disposal area.

Additionally, 24 potential areas of concern (PAOC) are located in the vicinity of the State Department building complex and are currently the subject of RCRA Facility Assessments.

Figure 1 locates the State Department building complex and the nearby SWMUs and PAOC. Table 1 summarizes known information relating to the nearby PAOC.

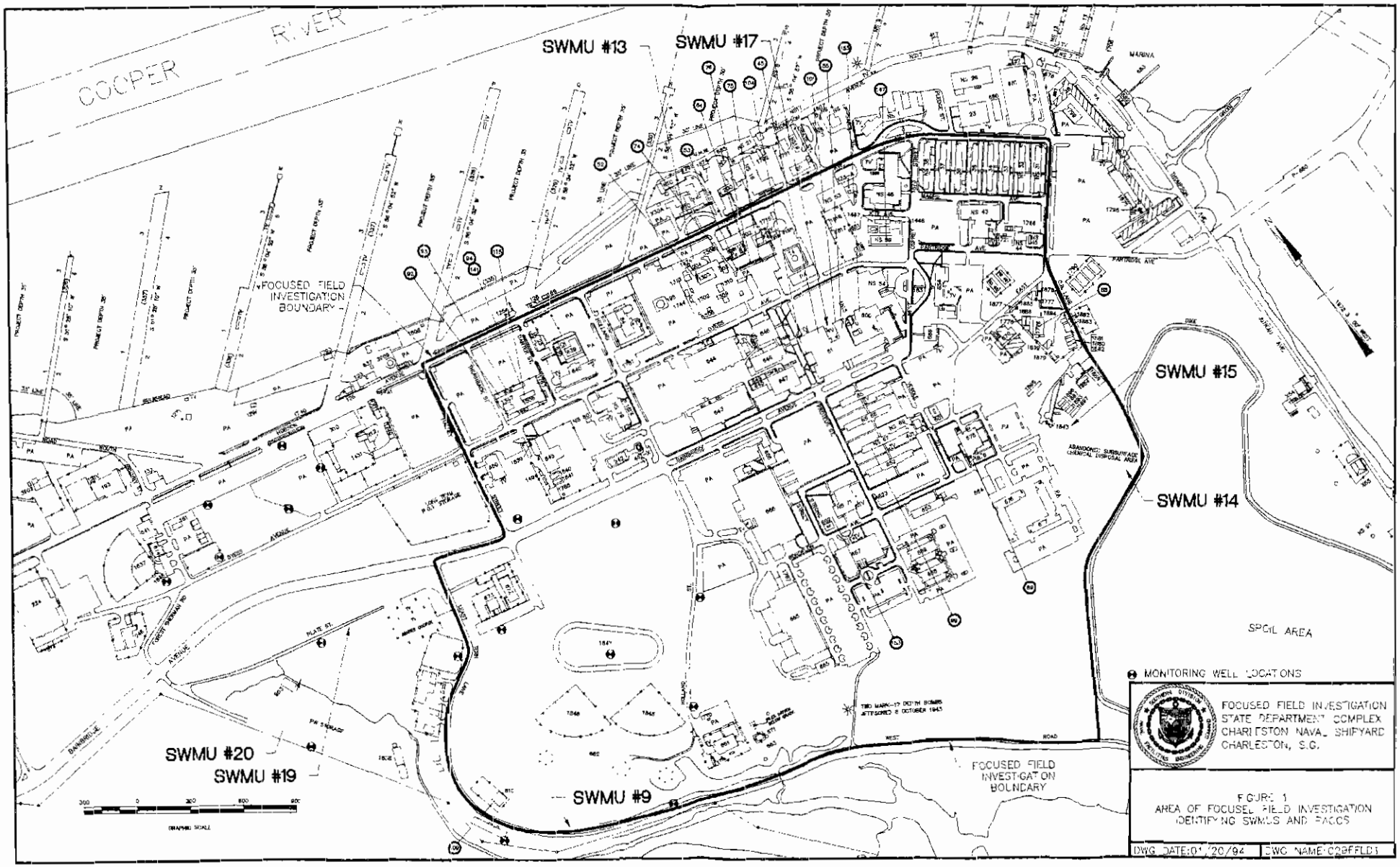

COOPER RIVER
SWMU #13
SWMU #17
FOCUSED FIELD INVESTIGATION BOUNDARY
SWMU #15
SWMU #14
SPOIL AREA
SWMU #20
SWMU #19
SWMU #9
FOCUSED FIELD INVESTIGATION BOUNDARY
MONITORING WELL LOCATIONS
FOCUSED FIELD INVESTIGATION
STATE DEPARTMENT COMPLEX
CHARLESTON NAVAL SHIPYARD
CHARLESTON, S.C.
FIGURE 1
AREA OF FOCUSED FIELD INVESTIGATION
IDENTIFYING SWMUS AND AOCS
DWG DATE:01/20/94
DWG NAME:C28FFLD1

Table 1
Potential Areas of Concern
State Department Complex Vicinity

PAOC	Facility	Description	Suspected Contents
153	602	8000-gallon Fuel Oil Tank	Oil
115/92/93	636	Auto Hobby Shop	Various
55	NS53	Maintenance Shop	Various
147	NS54	Billeting Office	Gasoline
94/141	NS1508	Car Wash/Hobby Shop	Various
99	NS67	Enlisted Barracks	Various
42/45/101/104 [SWMU 17]	FBM 61	Sub Training Center	Various
109 [SWMU 9]	810	MWR Recycle Center	Various
52/53/54/ 74/75/76	202	Fleet Mine Warfare Training Center	Various
151 [SWMU 9]	N/A	Landfill	Various
155	600	30,000-gallon Fuel Oil Tank	PCB and Oil
85	1776	CBU-412 Shop	Oil and Anti-freeze
69	675	Dental Clinic	Various

GEOTECHNICAL SETTING

Some areas surrounding the building complex are known to be filled with material dredged from the Cooper River overlying the natural organic detritus associated with coastal lowlands. Land subsidence occurs under buildings supported by pile foundations. One nearby building, the Base

Exchange (Building 656), has experienced differential settlement causing construction joints to open. The location of the Exchange appears on Figure 1.

HYDROGEOLOGIC SETTING

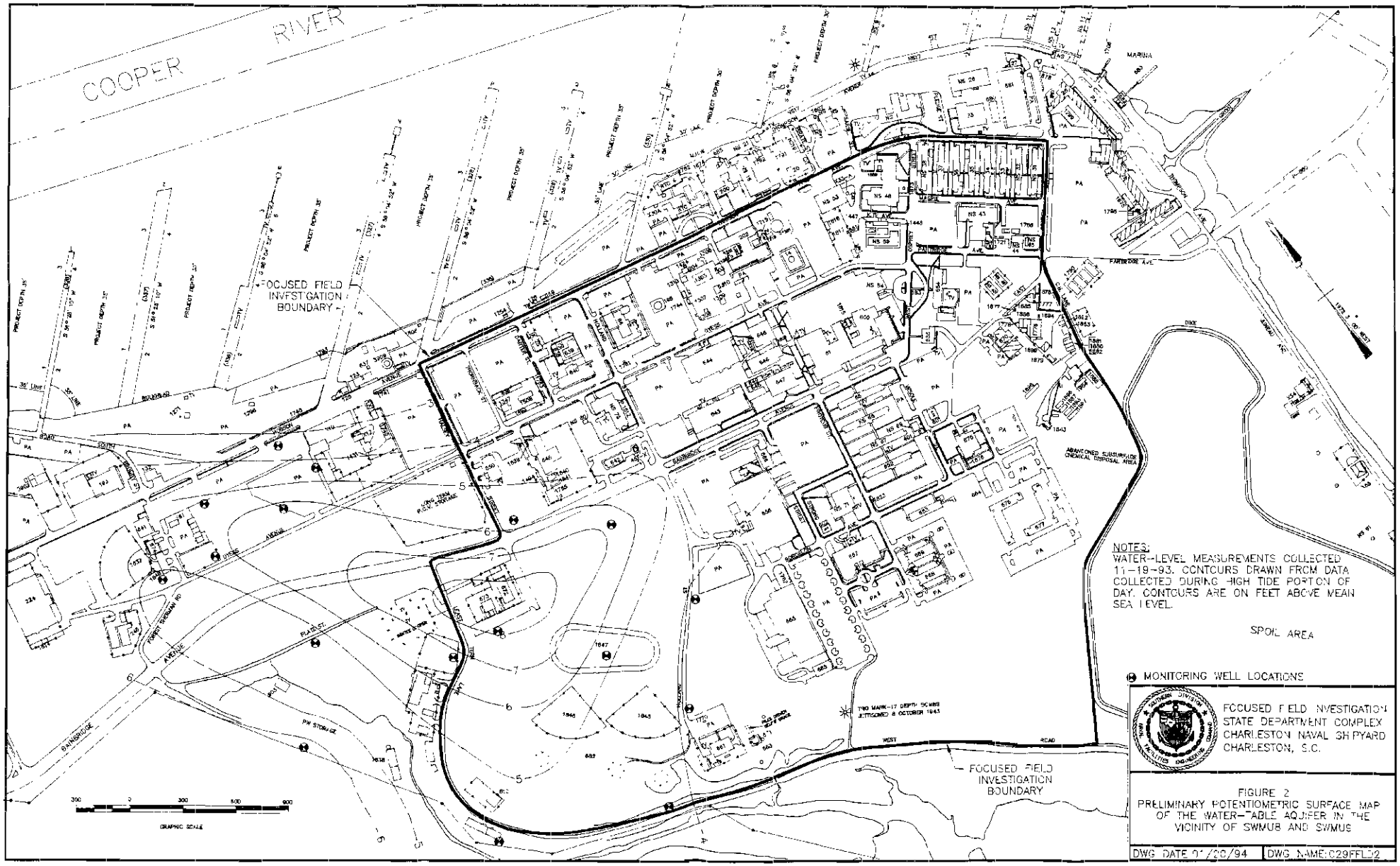
The preliminary results of the RFI elements in the vicinity of the State Department Complex indicate a groundwater high exists near the intersection of Bainbridge Ave. and Least Tern Ln. Figure 2 presents the preliminary piezometric surface contours. Data also identifies short-term fluctuations in piezometric surface elevations of 0.1-0.3 foot. Such short-term fluctuations are normally attributed to tidal fluctuations in the adjacent surface waters (Cooper River and Shipyard Creek). Fluctuations in piezometric surface and groundwater flow direction are frequently suspected of providing a mechanism for contaminant migration in groundwater and vadose zone gases.

RECENT DEVELOPMENTS

During a recent installation visit by USEPA, an anonymous ~~source~~ employee reported concerns about health problems among Base Exchange employees. Employees reported the emission of "musty" odors (often associated with continuing anaerobic decay of vegetation beneath the fill material) through separated joints in the floor slab and unconfirmed excessive rates of cancer among Exchange employees.

FOCUSED INVESTIGATION

Prior to occupation of the transferred buildings by the US State Department, a focused investigation is planned to assess any health risk emanating from SWMUs in the vicinity of the building complex. The initial RFI study will be performed according to the existing Interim Final RFI Work Plan, Charleston Naval Shipyard (14 October 1993). Inasmuch as the reports of gas emissions and adverse health affects are associated with the Base Exchange, the investigation will initially encompass an area extending at least one block beyond the State



NOTES:
WATER-LEVEL MEASUREMENTS COLLECTED 11-19-93. CONTOURS DRAWN FROM DATA COLLECTED DURING HIGH TIDE PORTION OF DAY. CONTOURS ARE ON FEET ABOVE MEAN SEA LEVEL.

MONITORING WELL LOCATIONS

FOCUSED FIELD INVESTIGATION
STATE DEPARTMENT COMPLEX
CHARLESTON NAVAL SHIPYARD
CHARLESTON, S.C.

FIGURE 2
PRELIMINARY POTENTIOMETRIC SURFACE MAP OF THE WATER-TABLE AQUIFER IN THE VICINITY OF SWMU8 AND SWMU9

DWG DATE 01/20/94 | DWG NAME:029FFL02

Department building complex, generally bounded, clockwise, by Hobson Ave./Osprey St./C B Ln./northwest dike of the Spoil Area/West Rd./Least Tern Ln./Bainbridge Ave./Halsey St./Hobson Ave. Figure 1 outlines the initial study area.The focused investigation will include these major components:

- A field investigation to assess the potential migration of gaseous contaminants from SWMUs to the nearby buildings.
- A risk assessment to evaluate real or potential threats to human health or the environment.
- A Community Relations Summary.

The following paragraphs summarize the focused investigation elements.

FIELD INVESTIGATION

Building Surveys

Separated joints or cracks in floor slabs could constitute migration pathways for soil gases to enter occupied spaces; therefore, each building within a one block area of the State Department complex will be visually examined. Floor plans, acquired during the Base Realignment and Closure (BRAC) environmental baseline survey (EBS), will be used to guide the surveys (expansion/construction joint locations) and to record the results. Floor separation locations and unsealed utility penetrations will be used in the development of floor slab emission sources, work space air quality, and vadose zone elements of the investigation.

Personnel interviews in the study area will be conducted and employees alleging the occurrence of "musty odors" will be interviewed regarding recurring conditions associated with the emissions of the odors.

make more general; Do you real in the study area have any environmental hazards.

The building surveys will produce a list of floor "penetrations" locations for potential air emission source sampling.

Indoor Air Quality Study

The proposed air sampling strategy is designed to maximize the likelihood of detecting airborne volatile and semi-volatile organic contaminants emanating from the soil into the overlying buildings. Key components are as follows:

Sample Methodology — Air samples will be collected into evacuated stainless steel SUMMA canisters, sealed and shipped to a commercial laboratory for analysis. Vacuum flow regulators will be used to control the sampling period (these regulators can be set to collect an integrated composite sample over a prescribed period).

Sample Period — 24 hour sampling periods have been selected to maximize detecting airborne contaminants emanating from floor slab separations or unsealed utility penetrations. Sampling periods will encompass two flood and two ebb tides. Also, samples will be collected for employee interviews identifying correlations with any recurring condition.

Sample Location — Air samples will be collected at two principal locations:

a) Floor separations/penetrations — with the objective of quantifying any sources of airborne contaminants within the buildings (sampling probes will be extended as far into the separation as practical and if possible, into any underlying voids).

b) The breathing zone in the most frequently/densely occupied areas of the buildings--to assess human exposures to airborne contaminants.

Baseline air quality will be established by ambient air sampling outside the buildings.

Sample Analysis and Sensitivity — Samples will be analyzed using EPA Compendium Method TO-14; *The determination of Volatile Organics in Ambient Air Using SUMMA Passivated Canister Sampling and Gas Chromatographic Analysis*, having detection limits of 10 ppb or less for volatile compounds.

Note: These methods are also sensitive enough to likely detect airborne chemicals associated with retail products routinely present in the building, such as, scented soaps and toiletry items, cleaning products, skin care products, adhesive, felt markers and paints.

Soil-Gas Survey

Although the soil gas and geophysical survey completed in 1993 at the old landfill (SWMU #9) showed only isolated responses central to the landfill, a supplemental passive soil gas survey will be designed to investigate the potential for contaminant migration and possible impact in the building area complex. A grid pattern will be established to define potential volatile and semivolatile contamination in the complex, as well as assess possible migration and/or dispersion pathways. Sample collectors, continually collecting soil gases for 3 to 5 days, will be placed in the ground. Sampling over time enhances sensitivity, minimizes the risk of obtaining false negatives and allows samples to be collected over multiple tidal events.

Soil-Gas Sample Collectors

Installation — The sample collector consisting of a glass sample tube containing two collector wires, coated with activated charcoal, serves as an adsorbent for volatile and semivolatile compounds. Sample collectors will be placed in the bottom of a narrow borehole dug with a hand auger or shovel approximately 18 inches in depth. (Boreholes for sample locations on asphalt will be dug slightly deeper to avoid possible false semivolatile readings.)

Following the installation of the sample collectors, the borehole will be covered to trap the soil vapors and protect the sampler, and a marker flag or stake will be placed next to the borehole.

Analysis — Once a sample from a sample collector at each designated sampling location is collected, the tube will be sealed and shipped to a commercial laboratory for analysis by a Curie-point desorption mass spectrometer system. If data is inconclusive, the second wire from the sample tube will be analyzed by a gas chromatograph.

Following data analysis, contour maps will be generated indicating areas of concentration for detected constituents and appropriate locations for soil borings/monitoring wells for more quantitative analyses will be selected.

When sample collectors are removed from the ground, boreholes will be filled to ground surface with excavation spoils or clean fill and an asphalt patch where necessary.

Soil and Groundwater Study

Soil borings/monitoring wells will be installed in selected locations to assess the magnitude of groundwater surface fluctuations and quantifiably determine the potential for soil and groundwater contamination. Preliminary boring locations will depend on the results of the building survey and final locations will be determined by the results of the soil gas survey. If no contaminants are identified during the preliminary investigation, both soil and groundwater will be sampled in suspect areas as necessary. All sampling protocols will be in accordance with procedures outlined in the Interim Final RFI Work Plan, Charleston Naval Shipyard (14 October 1993). Every attempt will be made to coordinate activities with the ongoing RFI and incorporate data into the RFI report.

In at least three September 1993 SWMU 9 RFI wells located various distances from the shoreline, continuous water level recorders will be installed to record the piezometric surface fluctuations over a 72-hour period (12 tidal cycles). A piezometric surface diagram for the study area will be constructed and used to predict potential groundwater fluctuations under the buildings.

Soil and groundwater samples will be analyzed in accordance with Interim Final RFI Work Plan, Charleston Naval Shipyard (14 October 1993). For SWMU's where other analytes are present, supplemental analytical methodologies will be incorporated.

Risk Assessment

Using results of the contaminants detected in the focused field investigation, a risk assessment will be performed for human health and environment. The risk assessment will conform to the *Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Volume I, USEPA/540/1-89/002* and Environmental Evaluation Manual, Interim Final, Volume II, USEPA/540/1-89/001, December 1989 (RAGS). The allegation of adverse health affects among Exchange employees shall be investigated by review of employment records (e.g., work location(s), length of service) and medical records. Should records support the allegations, an epidemiological study will be performed, under the guidance provided by the Naval Environmental Health Center (NEHC) and/or Agency for Toxic Substances and Disease Registry (ATSDR).

The epidemiological study, if necessary, will quantitatively compare the health statistics of Naval Base Charleston employees to those of similar worker populations to determine any factual basis for the anecdotal allegation provided during the USEPA installation visit.

COMMUNITY RELATIONS PROGRAM

The Public Affairs Officers (PAOs) of SOUTHDIV and Naval Base Charleston will continuously monitor the progress of the focused investigation and it's results. Should the results justify public notification, or should media representatives make inquiries regarding the investigation, the PAOs will produce appropriate press releases, fact sheets, etc.. Appendix A contains the outline of a Community Relations Stepped Approach.

SCHEDULE

Figure 3 presents a preliminary schedule for the Focused Field Investigation. The Risk Assessment produced from the Focused Field Investigation will exclusively address the State Department building complex. This interim deliverable will be incorporated into the Baseline Risk Assessment at the completion of the Zone 1 RFI.

EARLY START	EARLY FINISH	ORIG DUR	Activity
11JAN94	12JAN94	2	Draft Focused Field Investigation Study Plan
12JAN94	14JAN94	3	EPA Review and Comment
17JAN94	26JAN94	8	Final Focused Field Investigation Study Plan
11JAN94	4FEB94	19	Employee Medical History Review
14JAN94	11FEB94	21	Building Survey
31JAN94	18FEB94	15	Indoor Air Sampling
31JAN94	18FEB94	15	Soil Gas Sampling
14FEB94	18MAR94	25	Soil and Groundwater Study
21FEB94	25MAR94	25	Soil and Groundwater Sampling
1FEB94	15APR94	54	Sample Analysis
14FEB94	29APR94	55	Data Review and Validation
28FEB94	20MAY94	60	Baseline Risk Assessment
28FEB94	20MAY94	60	Draft Tech Memo Preparation

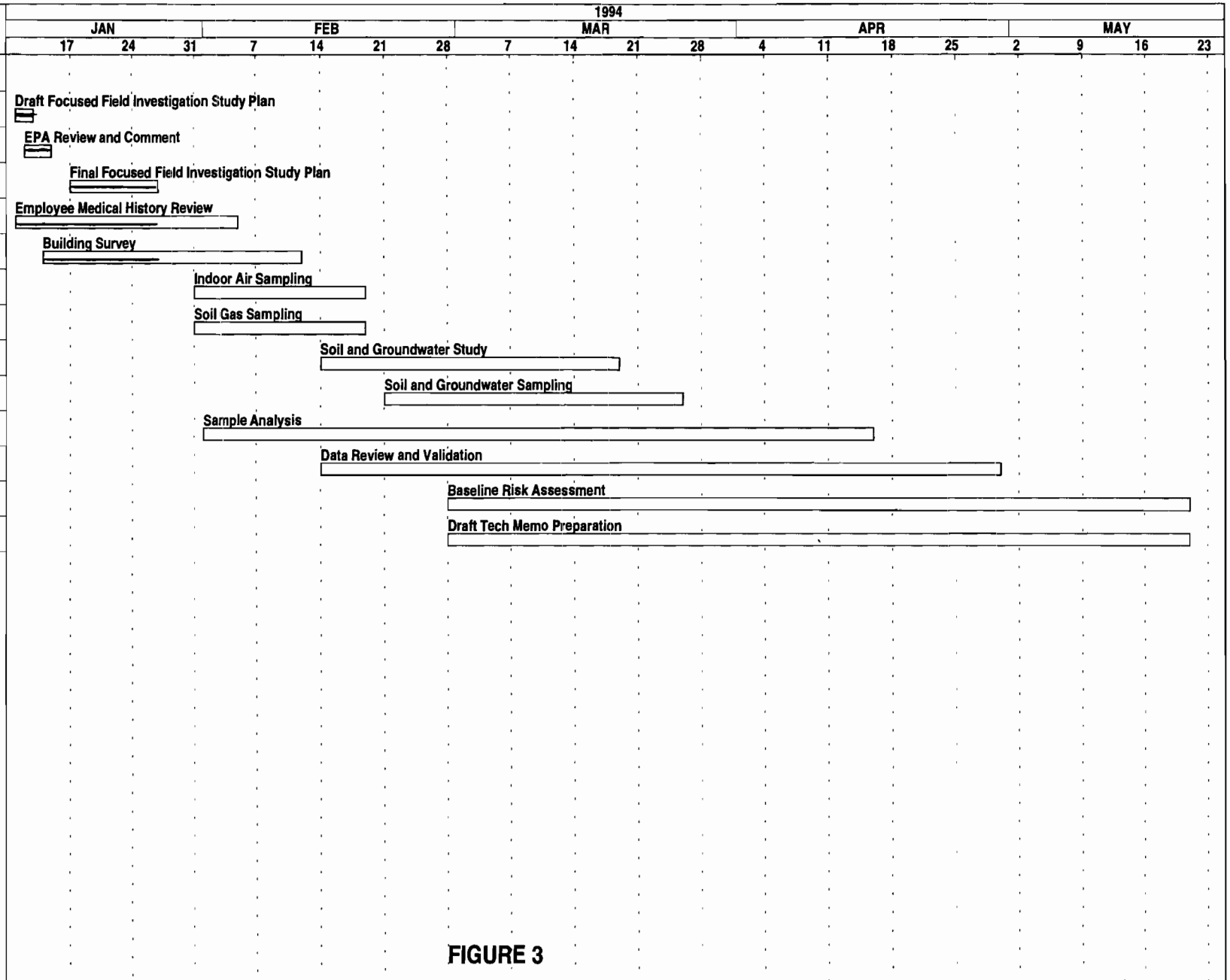


FIGURE 3

Plot Date 20JAN94
Data Date 10JAN94
Project Start 10JAN94
Project Finish 20MAY94

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

JS01

Sheet 1 of 1

Focused Field Investigation Schedule
State Department Complex
Naval Base Charleston, SC

U.S. Navy SOUTHDIVNAVFACENGCOM, N62467-89-D-0318

Date	Revision	Checked	Approved

APPENDIX A

COMMUNITY RELATIONS STEPPED APPROACH

Community Relations Summary for the
Focused Field Investigation
Naval Base, Charleston

- Before field work begins, hold information sessions/provide fact sheet to workers in the area of field investigations/elected officials/RAB/media reps. Publicize information source at the Naval Base and location of the information repository which was established in 1993.

- Provide updates throughout the field investigation, using the Installation Restoration Community Relations Plan as a guide. These updates will be in the form of media releases, fact sheets, paid advertisements, and community meetings. These updates will communicate to the public information on the progress of the field investigation, safety plans, results of tests, risk assessment and future actions.

- Copies of fact sheets, media releases, or other information released about the field investigation will be provided to EPA Region IV, DHEC simultaneously.

- Allow opportunities for public input during investigation to address concerns on a more frequent basis.