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**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION  
FINAL SAMPLING AND ANALYSIS PLAN  
FOR SITE 14  
DREDGE SPOIL FILL AREA  
NAVAL AIR STATION  
PENSACOLA, FLORIDA**



SOUTHNAVFACENGCOM  
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**Prepared for:**

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION PLAN  
NAVAL SUPPORT ACTIVITY  
NAVAL AIR STATION  
PENSACOLA, FLORIDA**



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**August 25, 1994**

**Release of this document requires the prior notification of the Commanding Officer of the Naval Air Station, Pensacola, Florida.**

ERRATA  
FINAL SAMPLING AND ANALYSIS PLAN (SAP),  
FOR SITE 14  
NAVAL AIR STATION (NAS) PENSACOLA  
PENSACOLA, FLORIDA  
(10/14/94)

Please make the following additions or corrections to the SAP.  
[Bold items enclosed in brackets denote changes to the latest draft of document]

Report Documentation Page. 19. Abstract. 1st and 2nd paragraph

The purpose of this investigation is to delineate nature, **extent** and magnitude of contaminated **soil**, [sediment], groundwater, [and surface water].

Field activities to be **performed** during the Preliminary Site Characterization include the completion of soil borings and monitoring wells, the collection of **soil**, [sediment], groundwater, [and surface water] samples, and a hydrologic and **ecologic** assessment.

Page v. Executive Summary. 1st paragraph

The purpose of this investigation is to delineate the nature, extent and magnitude of contaminated soil, groundwater, sediment, [and surface water.]

Page 1. Section 1.0 Introduction. 3rd paragraph

Field activities to be **performed** during the Preliminary Site Characterization include the completion of **soil** borings and monitoring wells, the collection of soil, sediment, groundwater, [and surface water] samples, and a hydrologic assessment.

Page 5. Section 2.2 Site History. 2nd paragraph

Delete the **sentence**:

"Because this **area** of land was created by dredge spoil materials **from** the bay, **it** is considered state-owned land and not Navy **property** (NEESA, 1983)."

**Page 7. Section 4.0 Field Sampling Plan. 1st paragraph**

The field investigation includes advancing **soil** borings, **installing** groundwater monitoring wells, and collecting **soil**, sediment, groundwater, [and surface water **samples**] using various techniques.

**Page 8. Section 4.2 Sampling and Analytical Requirements. 1st paragraph**

The proposed number of **soil**, [sediment], groundwater, [and surface water samples] is **also listed** in Table 4-1.

**Page 9. Section 4.2 Sampling and Analytical Requirements. Table 4-1**

See attached Table 4-1

**Page 11. Section 4.3 Sample Location and Rationale. 4th paragraph**

Sediment Samples — [A FSA will be conducted on two samples collected from **each** of the two dredge spoil basins for a total of four FSA samples. **These** samples **will** also be analyzed for **GS** analysis. Two samples **will** also be collected for FSA and **grain size** analysis at each of the two outfalls emptying into Pensacola Bay. **These** samples will be collected **as** discrete and/or composite samples.]

**Page 12. Section 4.3 Sample Location and Rationale. Figure 4-1**

See attached Figure 4-1

**Page 13. Section 4.3 Sample Location and Rationale. 2nd paragraph**

Add this text:

[Surface Water Samples — A **FSA will be conducted on** two samples collected from **each** of the two **dredge spoil drainage basins** for a total of four samples. **Due to** the **shallow** depth of the water within the basins, one sample, **representing** the **entire** water column, will be collected at each location. One sample from **each** basin **will also be** analyzed for PPW.]

**Page 14. Section 4.4.5 Surface Water Sampling**

Add this text:

**[4.4.5 Surface Water Sampling**

**Surface water samples will be collected by placing the sample container *into* the surface water body as described in Section 7.3 of the CSAP.]**

## Report Documentation Page

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Program Element No.	Project No.	Task No.	Work Unit Accession No.										
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Field	Group	Sub-Group											

19. Abstract

This Sampling end Analysis Plan (SAP) is written for Site 14, the Dredge Spoil All Area. The purpose of this investigation is to delineate nature, extent and magnitude of contaminated soil and groundwater.

Physical surveys to be conducted during the Preliminary Site Characterization include a well inventory, a contaminant source survey, and a habitat and biota survey. Field activities to be performed during the Preliminary Site Characterization include the completion of soil borings and monitoring wells, the collection of soil and groundwater samples, and a hydrologic and ecologic assessment. Chemical analyses will be completed by a laboratory approved by the Naval Energy and Environmental Support Activity (NEESA) using Contract Laboratory Program (CLP) protocol. Field sampling, analytical methods, and reporting will be conducted at U.S. Environmental Protection Agency (USEPA) Level IV protocol.

This SAP, in conjunction with the Comprehensive Sampling and Analysis Plan, will provide guidelines for sampling and analytical techniques to be used during the investigation and outline proper documentation procedures for the investigation.

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## List of Acronyms

The following list **contains** many of the acronyms, **initials**, abbreviations, and units of measure used in this report.

bls	Below Land Surface
BNAs	base-neutral/acid extractable organic compounds
<b>CLEAN</b>	Comprehensive <b>Long-Term</b> Environmental Action <b>Navy</b>
CLP	Contract Laboratory <b>Program</b>
CSAP	Comprehensive Sampling and Analysis Plan
DQO	Data Quality Objective
E/A&H	EnSafe/Allen & Hoshall
<b>E&amp;E</b>	Ecology and <b>Environment</b> , Inc.
<b>FDEP</b>	Florida Department of Environmental Protection
FS	Feasibility Study
FSA	Full <b>Scan</b> of Analysis
<b>G&amp;M</b>	<b>Geraghty</b> and Miller, Inc.
GPS	Global Positioning System
<b>GS</b>	<b>Grain Size</b>
<b>HEX</b>	Hexavalent <b>Chromium</b> Analysis
<b>IAS</b>	<b>Initial</b> Assessment Study
<b>IDR</b>	Interim Data <b>Report</b>
<b>IWTP</b>	Industrial Wastewater Treatment Plant
msl	Mean <b>Sea</b> Level
NAS Pensacola	Naval Air Station Pensacola
NEESA	Naval Energy and Environmental <b>Support</b> Activity
OU	Operable Unit
PAHs	Polynuclear Aromatic Hydrocarbons
<b>PCBs</b>	Polychlorinated Biphenyls
PPS	Physical <b>Parameters</b> , Sediment and <b>Soil</b>
PPW	Physical Parameters, Water
<b>PRGs</b>	<b>Preliminary</b> Remedial Goals
PVC	Polyvinyl Chloride
QA	<b>Quality Assurance</b>
QC	<b>Quality Control</b>
RI	<b>Remedial</b> Investigation
<b>SAP</b>	Sampling and Analysis <b>Plan</b>
SOP/QAM	Standard Operating Procedures and Quality Assurance Manual
SOUTHNAVFACECOM	Southern Division, <b>U.S.</b> Navy, Naval Facilities Engineering Command
ST	Shelby <b>Tube</b>
TAL	Target <b>Analyte</b> List
<b>TCL</b>	Target Compound <b>List</b>

TKN  
TOC  
TRPHs  
USEPA  
VOCS

Total Kjeldahl Nitrogen  
Top of Casing  
Total Recoverable Petroleum Hydrocarbons  
United States Environmental Protection Agency  
Volatile Organic Compounds

## EXECUTIVE SUMMARY

This Sampling and Analysis **Plan** (*SAP*) is written for Site 14, the Dredge **Spoil** Fill Area. The purpose of **this** investigation is to delineate **nature**, extent and magnitude of contaminated **soil**, groundwater, and sediment.

Physical surveys to be conducted during the *preliminary* Site Characterization include a well inventory, a contaminant **source** survey, and a **habitat** and biota survey. Field activities to be **performed** during the **PreLiminary** Site Characterization include the completion of **soil** borings and monitoring wells, the collection of **soil**, groundwater, and sediment samples, and a hydrologic and ecologic assessment. Chemical **analyses** will be completed by a laboratory approved by the Naval Energy and Environmental **Support** Activity (**NEESA**) using Contract Laboratory **Program** (CLP) protocol. Field sampling, analytical methods, and reporting will be conducted at **U.S.** Environmental Protection Agency (USEPA) Level IV protocol.

**This SAP**, in conjunction with the Comprehensive Sampling **and** Analysis **Plan**, will provide guidelines for sampling and analytical techniques to be used during the investigation and outline proper documentation procedures for the investigation.

## 1.0 INTRODUCTION

As part of the U.S. Navy Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, a Preliminary Site Characterization will be completed by EnSafe/Allen & Hoshall (E/A&H) at Site 14 — Dredge Spoil Fill Area, located at the Naval Air Station Pensacola (NAS Pensacola), Pensacola, Florida. This Sampling and Analysis Plan (SAP) has been developed by E/A&H for this investigation, as tasked by the Southern Division, U.S. Navy, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) under Contract No. N62467-89-D-0318/070.

Primary references for this SAP include the *Comprehensive Sampling and Analysis Plan for Naval Air Station Pensacola* (CSAP) (E/A&H 1993), the United States Environmental Protection Agency (USEPA) Region IV *Standard Operating Procedures and Quality Assurance Manual* (SOP/QAM), and the *Contamination Assessment/Remedial Activities Investigation Work Plan — Group C* completed by Ecology & Environment, Inc. (E&E 1992). References to these documents are made throughout this plan. The investigation of Site 14 will be completed to fulfill requirements set forth in the E&E site work plan (1992) and this site-specific SAP. This investigation will be conducted in accordance with the SOP/QAM and CSAP.

The Site 14 preliminary characterization will assess the nature of any potential contamination identified during past and proposed field investigations. The results of the previous Phase I screening investigation are outlined in the *Interim Data Report (IDR), Contamination Assessment/Remedial Investigation, Dredge Spoil Fill Area (Site 14)* (E&E 1991). Before field activities begin, a well inventory, contaminant source survey, and habitat and biota survey will be conducted. Field activities to be performed during the Preliminary Site Characterization include the completion of soil borings and monitoring wells, the collection of soil, [sediment,] and groundwater samples, and a hydrologic and ecologic assessment. Chemical analyses will

[Bold items enclosed in brackets denote changes to the first draft of document.]

be completed by a laboratory approved by the Naval Energy and Environmental Support Activity (NEESA) using Contract Laboratory Program (CLP) protocol. Field sampling, analytical methods, and reporting **will** be conducted at USEPA Level IV protocol.

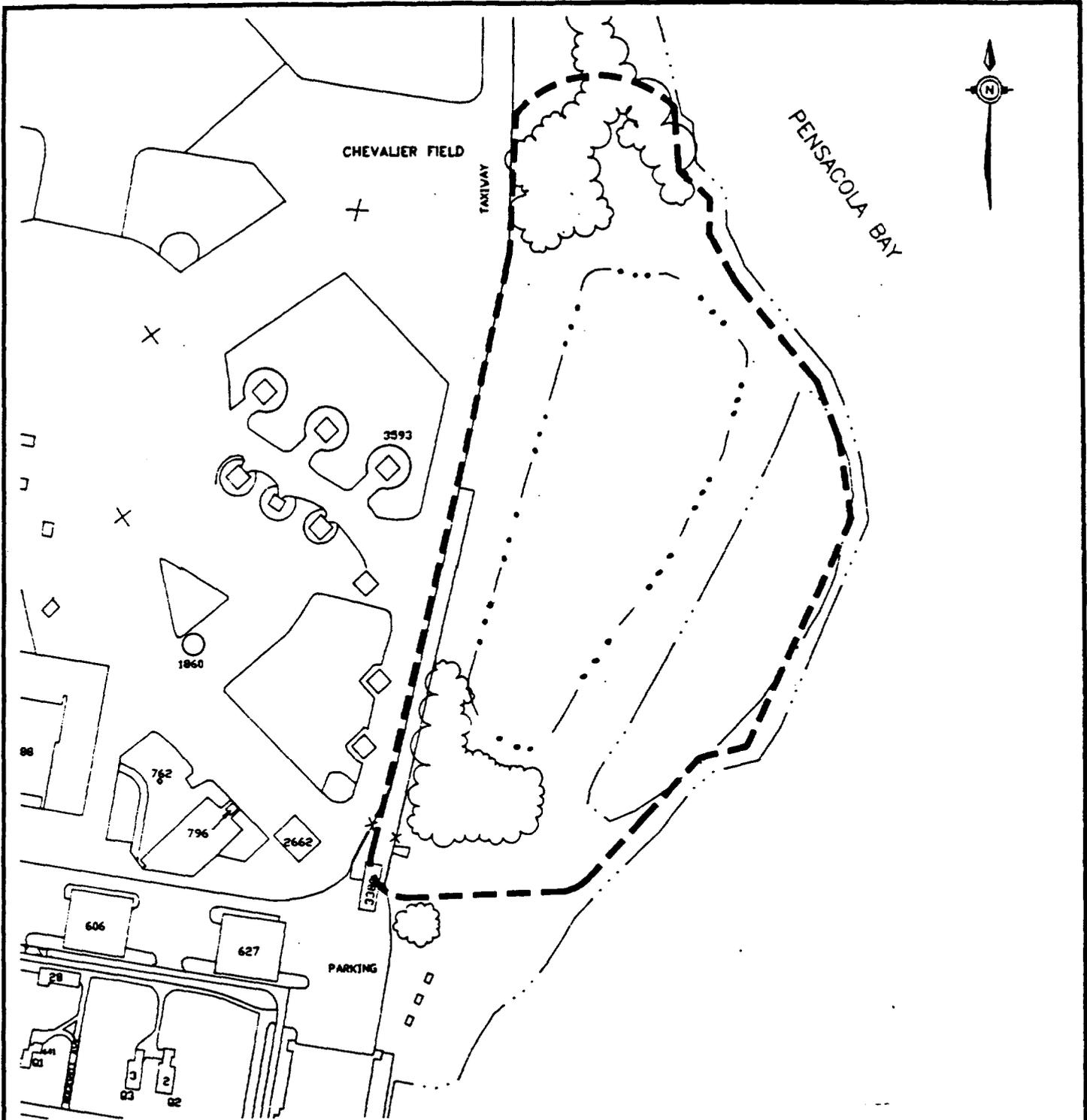
Upon completion of the investigative work and **laboratory analysis**, a [technical memorandum] will be **submitted** to the Navy, USEPA, and Florida Department of Environmental Protection (FDEP) **summarizing** the activities [and] results of the investigation. [The report **will** provide supporting **data** for the completion of a baseline **risk assessment**. This memo **will** also compare analytical results to a **set of Preliminary Remediation Goals (PRGs)**. If there are no analytical results above **PRGs**, a Preliminary Site Characterization Report **will** be submitted. **If** contaminants are present above **PRGs**, additional **work will** be outlined in the technical memorandum and **will** be sufficient to delineate nature and extent of identified contaminants. The final investigative results **will** be submitted in either a Preliminary Site Characterization Report or, **if** warranted based on health **risk**, an RI report. If an RI report is required, a feasibility study report **will** be submitted to examine alternative remedies.]

This **SAP**, in conjunction with the **CSAP**, **will** provide guidelines for sampling and **analytical** techniques to **be used** during the preliminary Site Characterization and outline proper documentation procedures for the investigation.

## **2.0 BACKGROUND INFORMATION**

### **2.1 Site Description**

Site **14** is located along the waterfront east of Chevalier Field approximately **200** feet south of Site 13 (see Figure 2-1). The **east** side of **Site 14** is **bordered** by Pensacola Bay.



LEGEND

— — — — — APPROXIMATE SITE BOUNDARY

400 0 400 800

GRAPHIC SCALE IN FEET



SAMPLING AND  
ANALYSIS PLAN  
NAS PENSACOLA  
PENSACOLA, FLORIDA

FIGURE 2-1  
SITE MAP  
SITE 14

DWC DATE: 09/03/93

DWG NAME: 70SITE14

**There are** no buildings, permanent monitoring wells, or paved **areas** onsite. Two major basins **are** within the site, one in the **eastern area** and a larger one along the western side. These basins were presumably created **as** settling basins to control turbid runoff from spoil discharge during the **disposal** of dredge material. The **berms** surrounding the **basins** are approximately **20** feet above mean **sea** level.

## 2.2 Site History

Site **14** was created in the late **1970s** from the dredging of Pensacola Bay to create an aircraft carrier turning basin and port. [Aerial photographs **from the 1950s show Site 14 as**] a shallow bay, and a **narrow, linear** beach paralleled the eastern edge of Chevalier Field. By **1961**, a broad spit projecting **1,900** feet into the bay had formed. **An October 12, 1961** aerial photograph shows the **initial** formation of a tidal pond **at** the northwest corner of the site, and a drainage ditch extending southeast from the edge of Chevalier Field to a small tidal pond at the southwest corner of the site. These surface water and drainage features were also evident in the 1964 and **1968** aerial photographs, although the ponds' **tidal inlets** appeared to **be** isolated from the open bay by 500 feet of beach. Between **1961** and **1968**, shrubby vegetation became established around both ponds and along the northern portion of the spit. **An east-west trending** dune system with sporadic shrubs **also** developed during **this period**.

**The May 4, 1973, and April 28, 1976 aerial** photographs **show** a diminished spit (**to 1,400** feet in length) and northern pond (from a width of approximately 180 feet **to** 80 feet). The photographs **also show** medium-sized **trees** along **the** north and southwest portions of the spit and well-established dune vegetation in the interior of the spit. The **1981, 1983, and 1986 aerial** photographs show an artificially **created berm** encircling most of the spit, which had been reduced to a length of **1,000** feet. The northern and southern wetland **areas** were excluded from the encircling **berm**. The eastern **half** of the spit was heavily covered with **trees** and shrubs, but

the western half was **composed** of bare sand, presumably dredge **spoil**. **Six linear** features of unknown purpose or origin extended approximately 100 feet into the **spoil** from the eastern border of Chevalier Field.

Additional dredged **spoil** materials from various **sources** were **disposed** of at the site between **1986** and **1989**. **An** October **26, 1989**, aerial photograph shows a widened (and probably heightened) berm and an additional north-south **trending** berm splitting the **spoil area** into two settling basins (the eastern basin about half the **size** of the western basin, both containing water). The trees and vegetation of the **eastern half** of the spit were removed. The locations of the two water control structures on the center berm were evident. Large **trees** were present in the northern areas, and sparse vegetation was present on the **berm**. **Because this area** of land was created by dredge spoil materials from the **bay**, it is considered state-owned land and not Navy property (NEESA **1983**).

E&E performed a Phase I screening investigation of **Site 14** to identify potential **contaminants** and areas of **concern**. The investigation results **are detailed** in the **E&E IDR (1992)**. During the investigation, sediment, **soil** and groundwater samples were **collected** and submitted for laboratory analysis. Metals (arsenic, chromium, zinc, lead, nickel, **cadmium**, and copper), **total** recoverable petroleum hydrocarbons (TRPHs), volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs) and phenols were detected. Further assessment was recommended in the vicinity of **Site 14**.

### **23 Physical Setting**

Climatology, biological **resources**, physiography, and hydrogeology for **Site 14** and **NAS Pensacola** are detailed in **Sections 4 through 7** of the E&E site work plan (**1992**).

### 3.0 PHYSICAL SURVEY

Various physical surveys have been conducted at Site 14 as part of E&E's Phase I screening activities. These include aerial photograph analysis, site reconnaissance, surface/particulate air emissions survey, a habitat and biota survey, and a radiation survey. Results of the physical surveys are presented in Section 3 of the IDR (E&E 1992). Relevant information from these surveys has been considered during planning of this Preliminary Site Characterization and will not be duplicated. Three surveys will be conducted before field activities begin: a well inventory survey, a contaminant source survey, and a habitat and biota survey.

#### Well Inventory

An inventory of existing monitoring wells will be completed in accordance with Section 3.1 of the CSAP.

#### Contaminant Source Survey

A contaminant source survey will be conducted to determine any potential sources and any present or past waste streams at the site. The survey will include a review of previous investigative reports, interviews with present and former NAS Pensacola personnel, an aerial photo analysis, and a utility survey.

The survey will include the identification of the following:

- Location of previous and current underground and overhead piping and utilities.
- Past and present chemicals used at the site.
- Locations of any known surface spills.
- Locations of any known historical outfalls.
- Locations and contents of any known present or former underground storage tanks.

[Bold items enclosed in brackets denote changes to the first draft of document.]

## Habitat and Biota Survey

[A Phase I habitat and biota survey will be performed in accordance with Section 8 of the CSAP. Data obtained during the Site 14 Preliminary Characterization will also be used to help assess ecological risk to any onsite or surrounding **terrestrial** and aquatic habitats potentially affected by **contaminant migration**.] The complete ecologic assessment of any adjacent wetland complex will be conducted as part of the RI of Site 41 (NAS Pensacola wetlands). If **ecological** impacts to wetland areas adjacent to Site 14 are suspected based on Phase I data, Phase II sampling will be performed during the Site 41 RI and in accordance with the Final RI/FS Work Plan for OU 41. If other ecological impacts (**terrestrial**) are suspected at Site 14 after the Phase I survey, Phase II sampling will be implemented as outlined in Section 8 of the CSAP.

## 4.0 FIELD SAMPLING PLAN

The field sampling plan describes sampling and field measurement procedures to be used during the Preliminary Site Characterization. The field investigation includes advancing **soil** borings, installing groundwater monitoring wells, and collecting **soil**, [**sediment**,] and groundwater samples using various techniques. A hydrologic and ecologic assessment will also be conducted.

### 4.1 Sampling Objectives

The objectives of the field sampling effort are to:

- e Identify potential **sources** of contamination.
- e **Assess** the nature of identified contaminants.
- e Delineate the extent of **soil**, [**sediment**,] and groundwater contamination.
- e Delineate migration pathways of the contaminants.
- e Identify potential **receptors** of the contaminants.

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#### 4.2 Sampling and Analytical Requirements

The sampling and analytical requirements are summarized in Table 4-1 and discussed below. The proposed number of soil and groundwater samples is also listed in Table 4-1. The Navy, USEPA, and FDEP will be apprised of any changes in the number of samples collected.

Any additional sources or previously undetected contamination will be investigated by the collection of additional samples from any given media, sampling additional media not included in this site-specific SAP, installation of additional monitoring wells to delineate the extent and depth of contaminants, and performance of aquifer response tests to characterize subsurface hydrologic conditions. Before additional field activities begin, a field change request will be submitted to the Navy for approval with notification to the USEPA and FDEP.

The USEPA CLP Target Analyte List/Target Compound List (TAL/TCL) will be used to provide a legally defensible full spectrum of contaminant analysis. Soil, sediment, and groundwater will be analyzed for the full TAL/TCL list with additional non-CLP analysis also being conducted when warranted. [Hexavalent chromium analyses will not be performed on collected samples due to the lack of previous detection during other investigations at NAS Pensacola (OU10, Site 1, Site 39).]

Analyses proposed in this SAP have been organized different than in the E&E site work plan (1992) which were subdivided into "Suites A through E." Proposed analytical parameters are now organized into the five basic groups listed below.

[Bold items dosed in brackets denote changes to the first draft of document.]

Table 4-1 Site 14 Sampling and Analytical Requirements			
Medium	No. of Samples <sup>a</sup>	Analytical Parameter	DQO <sup>b</sup> Level
Soil <sup>c</sup>	[26]	FSA	IV
	[(3)]	PPS	IV
	(2)	GS	IV
[Sediment <sup>d</sup> ]	[6]	FSA	IV
	[6]	GS	IV
Groundwater <sup>e</sup>	[2]	FSA	IV
	[(2)]	PPW	IV
[Surface Water <sup>f</sup> ]	[4]	FSA	IV
	[(2)]	PPW	IV
TOTAL	[38]	FSA	IV
	[(7)]	PPS/PPW	IV
	[(8)]	GS	IV

Source: Modified from **Ecology** and Environment, Inc., 1992.

Notes:

- a = The number of samples shown in parentheses will be analyzed for the additional parameters indicated.
- b = DQO - Data Quality Objective
- c = Total number of soil samples = [2] soil borings x 5 sample intervals = [10] samples [and 4 soil borings x 4 sample intervals = 16 samples.]
- [d] - Total number of sediment samples = 1 sample x 2 outfalls + 2 samples x 2 basins = 6 samples
- e = Total number of groundwater samples = [2] proposed shallow monitoring wells x 1 samples each = [2] samples.
- [f] = Total number of surface water samples = 2 samples x 2 basins = 4 samples

**FSA** — Full Scan of Analysis

Target Compound List (TCL) volatile organic compounds, TCL base-neutral/acid extractable organic compounds (BNAs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metal (unfiltered), and TCL cyanide.

**PPS** — Physical Parameters, **Soil**

Total phosphorus, nitrate-N, Total Kjeldahl Nitrogen (TKN), heterotrophic plate count, total organic carbon, and cation exchange capacity.

**GS** — Grain Size Analysis

**PPW** — Physical Parameters, Water

5-day biological oxygen demand, chemical oxygen demand, hardness, total suspended solids, alkalinity, total phosphorus, nitrate-N, TKN, and heterotrophic plate count.

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### New Analytical Organization

- **Full Scan of Analysis (FSA)** — A full scan consists of analysis for TCL VOCs, TCL base-neutral/acid extractable organic compounds (BNAs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), TAL **metals** (unfiltered), and TCL cyanide.
- e **Physical Parameters, Sediment and Soil (PPS)** — The parameters include total phosphorus, nitrate-N, **TKN**, heterotrophic plate count, total **organic carbon**, and cation exchange capacity. Additional sample volume will be **collected** for the **PPS** samples.
- e **Grain Size Analysis (GS)**
- e **Physical Parameters, Water (PPW)** — The parameters include 5-day biological oxygen demand, chemical oxygen demand, hardness, total suspended solids, **alkalinity**, total phosphorus, nitrate-N, total Kjeldahl nitrogen (TKN), and heterotrophic plate count. Additional sample volume **will be collected** for the **PPW** samples.

Modifications have **also been** made to the **list** of remedial/physical characteristic parameters proposed in the E&E site work plan (1992). Changes were **made** to the proposed analyses to address CERCLA rather than RCRA requirements (**i.e.**, the omission of **Appendix IX** analyses) and to acquire additional information **regarding** the physical characteristics of site **soil** and groundwater if a feasibility study is **required**. Therefore, **certain parameters** have **been** omitted **from** this **SAP** because they **are** either redundant to the comprehensive TAL/TCL **analytical methods**, provide **information** not legally **defensible**, or have **limited use**.

[**Bold items enclosed in brackets denote changes to the first draft of document.**]

### 4.3 Sample Locations and Rationale

**Proposed** sample locations **are** presented on Figure 4-1. The sampling **program** and any proposed modifications to the **E&E** site work plan (1992) **are** described below.

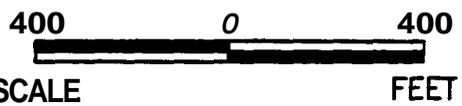
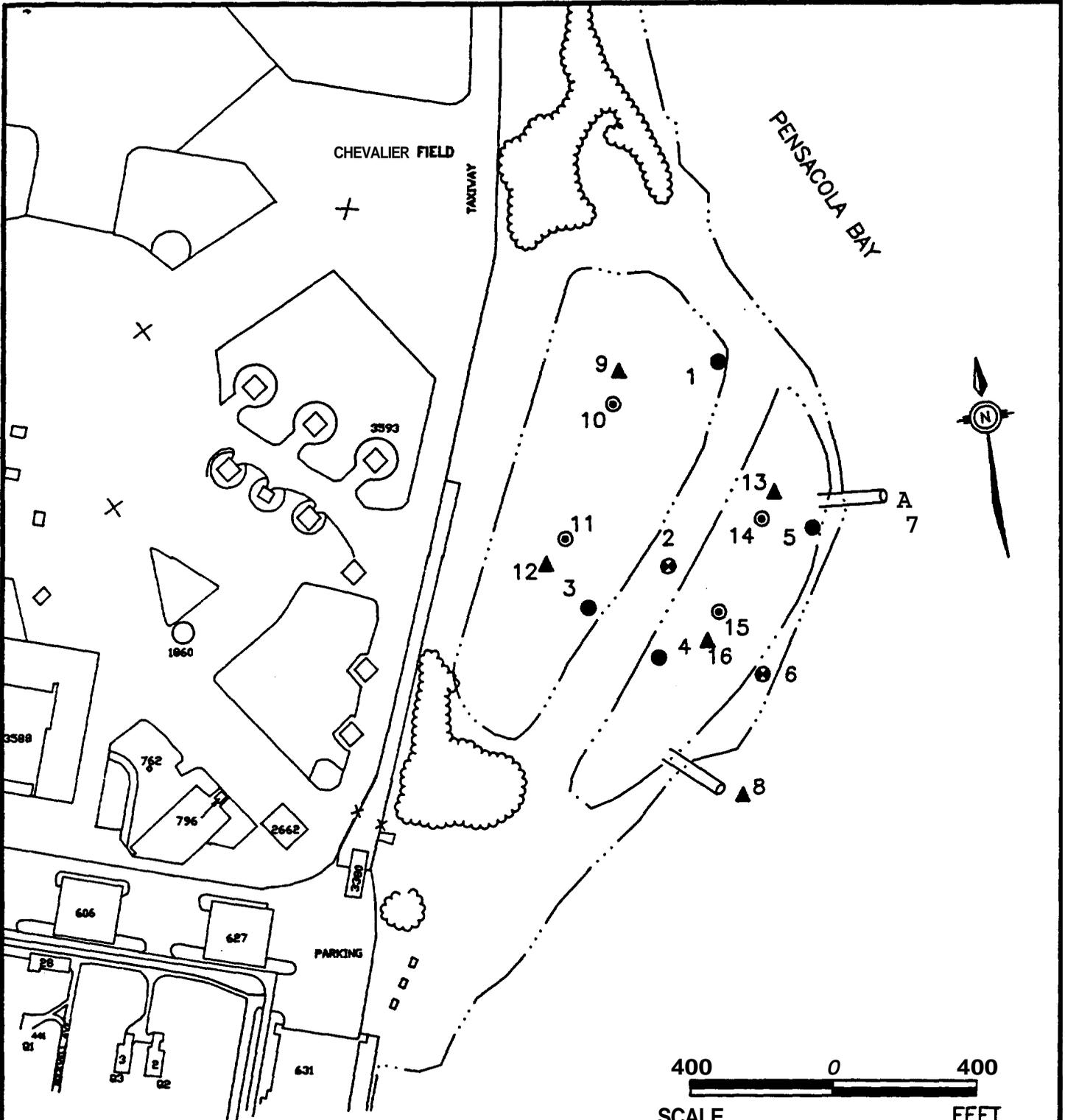
Soil Samples — A **FSA** will be conducted on approximately [26] soil samples collected from [six] soil boring locations. [Soil sampling intervals will be from 0 to 1 foot below land surface (bls), then at five foot intervals until the water table is reached. Depth to water is estimated to vary from 15 to 25 feet bls.]

PPS analyses **will** be conducted on [three] soil samples for [remedial design (if required)]. The PPS samples will be collected **to** represent both background and potentially contaminated conditions. **GS** analysis will be conducted on two soil samples representative of the screened interval of the shallow monitoring wells. Results of the **GS** analysis **will** be used to calculate recovery well specifications if a groundwater remediation program is *required*. Except for **grain** size, soil samples **are** not anticipated to be collected below the water table. If visual or olfactory evidence of contamination is observed below the water table, a sample will be collected for **an FSA** for characterization and delineation of potential **contamination**.

[Sediment Samples — A **FSA** will be conducted on two sediment samples collected at **each** of the two outfalls emptying into Pensacola Bay. Two samples will also **be** collected for **grain-size** analysis.]

Groundwater Samples — A **FSA** will be **conducted** on groundwater samples collected from [two] monitoring wells. The wells will be completed **to** a depth of 15 to 30 feet bls. The 15-foot variation in the target depth is due to significantly **sloping** topography **at** the site.

[Bold items enclosed in brackets denote changes to the first draft of document.]



LEGEND

- - SOIL BORING
- e - SOIL BORING AND PERMANENT SHALLOW MONITORING WELL
- A - SEDIMENT SAMPLE
- ⊙ - SURFACE WATER SAMPLE
- 1 - LOCATION REFERENCE NUMBER
- - OUTFALL



SAMPLING AND ANALYSIS PLAN  
 NAS PENSACOLA  
 PENSACOLA, FLORIDA

PRO FIGURE 4-1  
 PROPOSED SAMPLING LOCATIONS  
 SITE 14

PPW analyses will be conducted on two groundwater samples collected for the feasibility study to represent both background and potentially contaminated conditions.

#### 4.4 Sampling Procedures

Proposed sampling procedures are presented in Sections 4, 5, 6, and 7 of the CSAP. General sampling requirements will be performed in accordance with Section 2.2 of the CSAP with sample processing performed in accordance with Section 12. Sampling and any proposed procedure modifications to the CSAP or E&E site work plan (1992) are discussed below.

##### 4.4.1 Soil Sampling

Soil borings will be advanced using hollow-stem auger drilling techniques. Soil samples will be collected in accordance with Section 4.6.1 of the CSAP.

##### [4.4.2 Sediment Sampling

Sediment samples will be collected using a Ponar grab sampler as described in Section 7.2 of the CSAP.]

##### 4.4.3 Monitoring Well Installation and Development

Monitoring well borings will be advanced using hollow-stem auger drilling techniques. Because of possible floating contaminants, shallow monitoring wells will be installed so the well screen brackets the water table. The drilling methods and monitoring well installations will be in accordance with Sections 5.2 and 5.3 of the CSAP. In accordance with Florida Administrative Code Chapter 40A-3, neat cement grout is required in all monitoring well installations.

At least 24 hours after monitoring well installation is complete, the monitoring wells will be developed in accordance with Section 5.4 of the CSAP. Monitoring wells will be developed

using peristaltic pumps following an initial purging of coarse sediment-laden water using centrifugal pumps.] Monitoring well development will continue until the water withdrawn is free of turbidity based on the geology of the area and pH, temperature and specific conductivity have stabilized. These measurements will be recorded in accordance with Section 10.1 of the CSAP.

#### 4.4.4 Groundwater Sampling

Groundwater sampling will be performed in accordance with Section 6 of the CSAP. [peristaltic pumps may be used in place of bailers. Purge and sample tubing on peristaltic pumps will be constructed of Teflon and sample collection will take place between the pump and the well as outlined in Section F.1.3 of SOP/QAM. To prevent potential degassing of volatiles, samples collected for VOCs will be collected by disconnecting the tubing from the pump, and allowing the water in the tube to drain into the sample vials. Groundwater samples collected with a peristaltic pump should be collected near the top of the water column and water should be as clear as possible given the subsurface geology (generally between 10 and 30 NTUs).] Field measurements to be recorded during groundwater sampling include pH, temperature, specific conductance, groundwater level, [turbidity] and organic vapor detection, in accordance with Section 10.1 of the CSAP.

#### 4.5 Hydrologic Assessment

A hydrologic assessment will be performed in accordance with Section 9.6 of the CSAP. [An initial water level assessment will be performed to determine shallow groundwater elevations, shallow groundwater flow direction(s), and hydraulic gradient(s).] Slug tests and/or specific capacity tests will be performed at selected monitoring wells sufficient for site characterization. If groundwater remediation is required, the results of the slug and/or specific capacity tests will be used to design the appropriate pumping tests. The Navy will accept

technical **responsibility** for the design and implementation of ~~these tests~~. The Navy, USEPA, and FDEP will be kept **apprised** of the investigation **as** it progresses, and will be notified **before** conducting full scale pumping tests. Pumping tests will be performed in accordance with the procedures provided in **Section 9.6.2** of the **CSAP**.

For all creeks and/or streams on Site 14 where flow **is** observed, the velocity, discharge, and water level elevation data will be **recorded** at approximately the same time **as** water levels **are** measured in the onsite wells.

#### **4.6 Ecological Assessment**

A minimum of a **Phase I** habitat and biota survey will be conducted in accordance with **Section 8.1** of the **CSAP**. Wetland complex (63A and 63B, Parsons and **Pruitt, 1991**) and Pensacola Bay will be further investigated during the Site **41 (NAS Pensacola Wetlands)** and Site **42 RIs**.

#### **4.7 Geodetic Survey**

[A geodetic survey **will** be performed using a global positioning system (GPS) in accordance with manufacturer's specifications.]

#### **4.8 Decontamination**

Decontamination procedures will be performed in accordance with **Section 11** of the **CSAP**.

#### **4.9 Investigation-Derived ~~wastes~~**

Investigation-derived wastes will be handled in accordance with **Section 13** of the **CSAP**.

#### **4.10 Field Quality Assurance/Quality Control**

Field quality assurance/quality control ( **QNQC** ) samples **will** be collected **in accordance with** the frequency presented in Table 15-1 of the CSAP. QA/QC procedures **will** be in accordance with Section **15.2** of the CSAP.

#### **5.0 QUALITY ASSURANCE PLAN**

The Quality Assurance **Plan** presented in Section 15 of the CSAP **will** be followed during the Site **14 Preliminary** Characterization.

#### **6.0 DATA MANAGEMENT PLAN**

The **Data** Management **Plan** presented in Section **14** of the CSAP **will** be followed during the Site **14 preliminary** Characterization.

## 7.0 REFERENCES

- Ecology and Environment, Inc. (1992). *Contamination Assessment/Remedial Activities Investigation ~~Work~~ Plan — Group C, Naval Air Station Pensacoh, Pensacola, Florida.* Ecology and Environment, Inc.: Pensawla, Florida.
- Ecology and Environment, Inc. (1992). *Interim Data Report, Contamination Assessment/Remedial Investigation, Dredge Spoil **Fill** Area (Site 14), Naval Air Station Pensacoh, Pensacola, Florida.* Ecology and Environment, Inc.: Pensawla, Florida.
- EnSafe/Allen & Hoshall. (1993). *Comprehensive Sampling and Analysis Plan For Naval Air Station Pensacola, Pensacola, Florida — Draft Final.* EnSafe/Allen & Hoshall: Memphis, Tennessee.
- Naval Energy and Environmental Support Activity (NEESA). (1983). *Initial Assessment Study of Naval Air Station, Pensacola, Florida.* NEESA 13-015
- Parsons, M. and Pruitt, B.A. (1991). *Pensacoh Naval Air Station Wetlands Advanced Identification*, U.S. Environmental Protection Agency, Environmental Services Division, Athens, Georgia.
- U.S. Environmental Protection Agency. (1991). *Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual*, U.S. Environmental Protection Agency, Region IV: Athens, Georgia.

**FLORIDA PROFESSIONAL GEOLOGIST SEAL**

I have read and approve of this Final Sampling and Analysis Plan for Site 14 — Dredge Spoil **Fill Area** and seal it in accordance with Chapter 492 of the Florida Statutes. In sealing this document, I **certify** the geological information contained in it is true to the best of my knowledge **and the** geological methods and procedures included herein are consistent with currently accepted geological practices.

Name: Steven J. Parker  
License Number: #1651  
State: Florida  
Expiration Date: July 31, 1996

  
\_\_\_\_\_  
Steven J. Parker

\_\_\_\_\_  
8/24/94  
Date