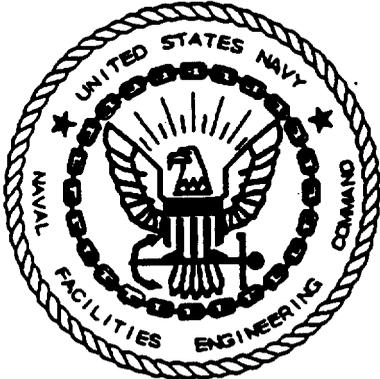


COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION
FINAL *SAMPLING AND ANALYSIS* PLAN
FOR SITE 26
SUPPLY DEPARTMENT OUTSIDE STORAGE
NAVAL AIR STATION
PENSACOLA, FLORIDA

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ENVIRONMENTAL ACTION NAVY (CLEAN)
NAVAL SUPPORT ACTIVITY
NAVAL AIR STATION
PENSACOLA, FLORIDA



Prepared by:

EnSafe/Allen & Hoshall
5720 Summer Trees Drive, Suite 8
Memphis, Tennessee 38134
(901) 373-9115

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19. Abstract

This Sampling and Analysis Plan (SAP) is written for Site 26, the supply department outside storage area, located immediately south of Building 684. This investigation will delineate the nature, lateral and vertical extent, and magnitude of contaminated soil and groundwater at this Site.

Investigative work will be completed by advancing soil borings, installing permanent monitoring wells, and collecting soil and groundwater samples for Target Analyte List/Target Compound List (TAL/TCL) analyses using Contract Laboratory Program (CLP) protocol, and special analytical services (SAS) as required.

This investigation will identify the presence or absence of contaminants at the site. Preliminary Remediation Goals (PRGs) will be established after evaluating the data for identified contaminants. Upon completion of the investigative work and laboratory analysis, a Remedial Investigation (RI) report will be submitted to the Navy, U.S. Environmental Protection Agency (USEPA), and Florida Department of Environmental Protection (FDEP) summarizing its activities, results, and conclusions. **[Due to the proximity of Site 26 to several other sites (11, 12, 25, 27, and 30), the possibility exists that solid and/or liquid media contamination may not be restricted to, or caused by, Site 26. In this case, the results of the Site 26 investigation may be incorporated into a larger report which addresses this contamination on a larger scale (ie. larger OU) and which incorporates the investigative results of the affected sites.]** This SAP, in conjunction with the Comprehensive Sampling and Analysis Plan (CSAP), will provide guidelines for sampling and analytical techniques to be used during the investigation, along with outlining proper documentation procedures.

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List of Acronyms

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

b/s	below land surface
BNAs	base-neutral/acid extractable organic compounds
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
CSAP	Comprehensive Sampling and Analysis Plan
DoD	Department of Defense
DQO	Data Quality Objective
E/A&H	EnSafe/Allen & Hoshall
E&E	Ecology & Environment, Inc.
FDEP	Florida Department of Environmental Protection
FS	Feasibility Study
FSA	Full Scan of Analysis
G&M	Geraghty and Miller, Inc.
GPS	Global Positioning System
GS	Grain Size
HEX	Hexavalent Chromium Analysis
IAS	Initial Assessment Study
IDR	Interim Data Report
IDW	Investigation Derived Waste
IWTP	Industrial Wastewater Treatment Plant
msl	mean sea level
NAS Pensacola	Naval Air Station Pensacola
NEESA	Naval Energy and Environmental Support Activity
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
ppm	parts per million
PPS	Physical Parameters, Soil
PPW	Physical Parameters, Water
PRG	preliminary Remediation Goal
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility study
SAP	Sampling and Analysis Plan
SAS	Special Analytical Services
SDWA	Safe Drinking Water Act
SOP/QAM	Standard Operating Procedures and Quality Assurance Manual
SOUTHNAVFACENGCOM	Southern Division, U.S. Navy, Naval Facilities Engineering Command
ST	Shelby Tube

TAL/TCL
TAL
TCL
TKN
TOC
TRPHs
USEPA
UST
v o c s

Target Analyte List/Target Compound List
Target Analyte List
Target Compound List
Total Kjeldahl Nitrogen
top of casing
Total Recoverable Petroleum Hydrocarbons
United States Environmental Protection Agency
Underground Storage Tank
Volatile Organic Compounds

EXECUTIVE SUMMARY

This Sampling and Analysis **Plan (SAP)** is written for Site **26**, the supply department outside storage area, located immediately south of Building **684**. This investigation will delineate the **nature**, lateral and vertical extent, and magnitude of contaminated **soil** and groundwater at **this** Site.

Investigative work will be completed by advancing soil borings, installing permanent monitoring wells, and collecting **soil** and groundwater samples for Target Analyte List/Target Compound List (TAL/TCL) analyses using Contract Laboratory Program (CLP) protocol, and **special** analytical services (SAS) as **required**.

This investigation will identify the presence or absence of contaminants at the site. Preliminary Remediation **Goals** (PRGs) will be established after evaluating the data for identified contaminants. Upon completion of the investigative work and laboratory analysis, a Remedial Investigation (**RI**) **report** will be submitted to the Navy, **U.S.** Environmental Protection Agency (USEPA), and Florida Department of Environmental Protection (FDEP) summarizing its activities, results, and conclusions. **[Due to the proximity of Site 26 to several other sites (11, 12, 25, 27, and 30), the possibility exists that solid and/or liquid media contamination may not be restricted to, or caused by, Site 26. In this case, the results of the Site 26 investigation may be incorporated into a larger report which addresses this contamination on a larger scale (ie. larger OU) and which incorporates the investigative results of the affected sites.]** This SAP, in conjunction with the Comprehensive Sampling and Analysis **Plan** (CSAP), will provide guidelines for sampling and analytical techniques **to** be used during the investigation, along with **outlining** proper documentation procedures.

10 INTRODUCTION

As part of the U.S. Navy Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, a Remedial Investigation/Feasibility Study (RI/FS) will be completed by EnSafe/Allen & Hoshall (E/A&H) at Site 26 — the Supply Department Outside Storage, 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-0318/970. This *SAP*, in conjunction with the CSAP, will provide guidelines for sampling and analytical techniques to be used during the Remedial Investigation and outline proper documentation procedures for the investigation.

Primary references for this *SAP* include the *Comprehensive Sampling and Analysis Plan for Naval Air Station Pensacola (CSAP)* (E/A&H 1994), 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 B* completed by Ecology & Environment, Inc. (E&E 1992). These documents are referred to throughout this plan. The Site 26 investigation will be completed to fulfill requirements set forth in the E&E site work plan (1992) and this site-specific *SAP*, will be conducted in accordance with the SOP/QAM and CSAP.

The Site 26 **RI** will assess the nature of any potential contamination identified during past and proposed field investigations. The results of the previous **Phase I** investigations are outlined in the *Interim Data Report (IDR), Contamination Assessment/Remedial Investigation, Supply Department Outside Storage (Site 26)* (E&E 1991), [and will be compared to the results of the proposed investigation]. Before field activities begin, a well inventory, contaminant source survey, and habitat and biota survey will be conducted.

Field sampling, analytical methods, and reporting will be conducted at USEPA Level IV protocol. Activities **performed** during the RI include the completion of **soil borings**, permanent monitoring wells; the collection of groundwater and **soil** samples; and a hydrologic assessment. **Soil** and groundwater samples will be collected for target analyte list/target compound list (TAL/TCL) analyses **using** a laboratory approved by the Naval Energy and Environmental Support Activity (NEESA) using Contract Laboratory **Program** (CLP) protocol. [In addition, Special Analytical Services (SAS) on specific analytes **may** be performed to achieve lower quantitation limits **as needed**.]

The investigation will involve the installation of permanent monitoring wells to enable groundwater samples to be collected. Also, soil samples will be collected from soil borings. The activities will confirm whether contaminants **are** present at the site. By comparing detected concentrations of [soil] contaminants to both the risk-based concentrations (RBCs) [for residential land] (developed by EPA Region III) and the risk-based cleanup **goals** (CGs) for Florida DoD sites (developed by **FDEP** [July 1994]). [The most recent RBC tables are used, these are 3rd quarter, 1994 for non-carcinogens, and 1st quarter 1994 for carcinogens (using a Hazard Index of **1**. Groundwater **contaminants will** be compared the Florida Drinking Water Standards and Guidance Concentrations, or the Safe Drinking Water Act (SDWA) Maximum Concentration Levels (MCLs). If ground water contamination, or the potential exists for soil contaminants to **leach** to ground water, **site-specific soil** actions levels will be developed for each contaminant]. Preliminary remedial **goals** (PRGs) will be established for **contaminants**. Further assessment activities will depend on whether soil and groundwater samples exceed the applicable **PRGs**, and whether further delineation is required.

When the investigative work and laboratory analysis **are** completed, **an RI report** will be submitted to the Navy, USEPA, and Florida Department of Environmental Protection (FDEP) summarizing the investigation's activities, results and conclusions.

2.0 BACKGROUND INFORMATION

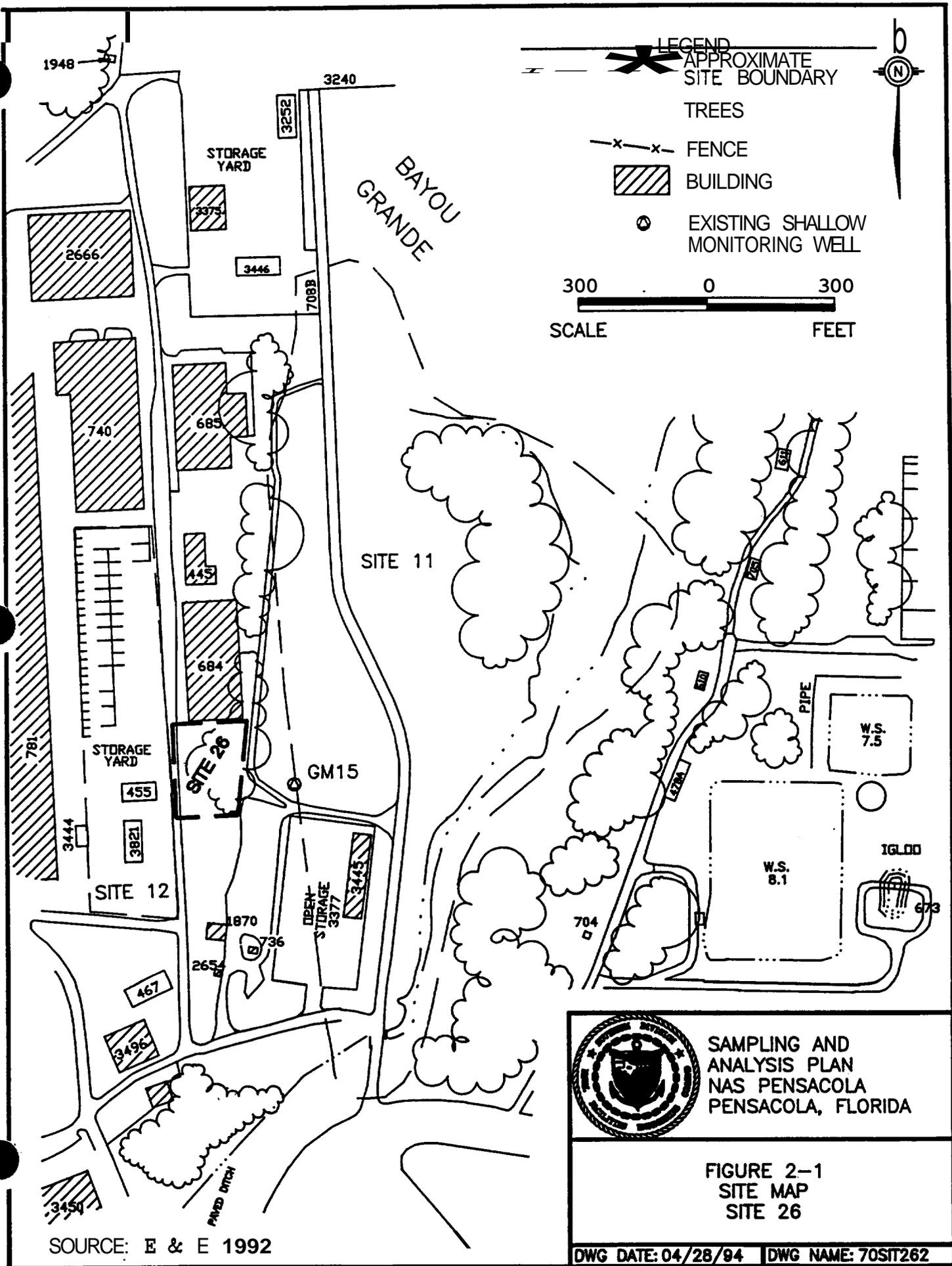
2.1 Site Description

Site 26 is northwest of Chevalier Field, immediately south of Building 684 (see Figure 2-1). The site is approximately 150 by 200 feet. Onsite is a small, prefabricated, open-sided metal shed (in the area of the former chemical storage building) that NAS Pensacola used to store chemicals. The site is bounded to the west by a paved road and to the east by a wooded area. Surface elevations average 15 to 18 feet above mean sea level (msl). No monitoring wells are located onsite; however shallow well GM-15 is located approximately 120 feet east [hydraulically downgradient] of the site.

2.2 Site History

This site was used prior to 1964 for outdoor storage of industrial chemicals, including paint strippers and acids, by the NAS Pensacola Supply Department. Incoming containers of these materials were placed on steel matting, where leaks into the soil sometimes occurred (NEESA 1983).

During an Initial Assessment Study (IAS) conducted by NEESA in 1983, three soil samples collected to a depth of 2 feet were analyzed for extraction procedure (EP) toxicity metals. The results showed no samples exceeded the toxicity limits. A Verification Study conducted by Geraghty and Miller Inc., in 1984, however, indicated chlorinated aliphatic solvents present at trace concentrations in a groundwater sample from monitoring well GM-15 (downgradient of Site 26). The presence of these solvents may represent contamination induced by prior spillage of paint-stripping chemicals at Site 26. Ecology and Environment (E & E) (1991) reported the presence of polycyclic aromatic hydrocarbons (PAHs) and total recoverable petroleum hydrocarbons (TRPHs) in soil, and metals and 1,1,1-trichloroethane (TCA) in groundwater. [The previous analytical work was not conducted according to Level IV protocol, and thus the accuracy of the data is difficult to verify].



1948

3240

STORAGE YARD

BAYOU GRANDE

SITE 11

STORAGE YARD

SITE 12

SITE 26

GM15

OPEN STORAGE 3377

PIPE

W.S. 7.5

W.S. 8.1

IGLOO



SAMPLING AND ANALYSIS PLAN
NAS PENSACOLA
PENSACOLA, FLORIDA

FIGURE 2-1
SITE MAP
SITE 26

2.3 Physical Setting

Climatology, biological resources, physiography, and hydrogeology for Site 26 and NAS Pensacola are detailed in Sections 4 through 7 of the E&E site work plan (1992).

3.0 PHYSICAL SURVEYS

Various physical surveys have been conducted at Site 26, as part of E&E's Phase I activities, including aerial photograph and site reconnaissance, surface/particulate air emissions, a habitat and biota survey, radiation survey, and a geophysical survey. Results of the physical surveys are presented in Section 3 of the Interim Data Report (IDR) (E&E 1991). Relevant information from these surveys was considered when planning this RI and will not be duplicated. Three surveys will be conducted before field activities begin: a well inventory survey, a contaminant source survey, and a more extensive habitat and biota survey.

3.1 Contaminant Source Survey

A contaminant source survey will be conducted to determine any potential sources and any present or past waste streams at the facility. The survey will include reviewing previous investigative reports, interviewing present and former NAS Pensacola personnel, analyzing aerial photographs and surveying utilities. To the greatest extent possible, 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 facility.
- Locations of any known surface spills.
- Locations of any known historical outfalls.
- Locations and contents of any known present or former underground storage tanks (USTs).

3.2 Habitat and Biota Survey

A Phase I habitat and biota survey will be performed in accordance with Section 8 of the CSAP, [this differs from the E & E survey in that it will be much more extensive]. Data obtained during the Site 26 RI also will be used to help assess ecological risk, in part by assessing any onsite or surrounding terrestrial habitats potentially affected by contaminant migration.

4.0 FIELD SAMPLING PLAN

The field sampling plan describes the sampling and field measurement procedures to be **used** during the RI. The field investigation includes advancing soil borings, **installing** groundwater monitoring wells, and collecting soil and groundwater samples using various techniques. Hydrologic and ecologic assessments also will be conducted for Site 26.

4.1 Sampling Objectives

The objectives of the field sampling effort **are** to:

- Identify potential sources of contaminants.
- **Assess** the nature of identified contaminants.
- Evaluate the extent of soil and groundwater contamination.
- Determine migration pathways of the contaminants.
- Identify potential receptors of the contaminants.

4.2 Sampling and Analytical Requirements

The sampling and analytical requirements for **this** investigation **are** summarized in Table 4-1 and discussed below. The proposed number of soil and groundwater samples also is listed in Table 4-1. The Navy, USEPA, and FDEP will be **apprised** of any changes in the number of samples collected. [**These sample locations were chosen by the NASP Tier 1 team in March, 1994**].

Any additional sources or previously undetected contamination will be investigated by collecting additional samples from any given media, sampling additional **media** not included in **this** site-specific **SAP**, installing additional monitoring wells to **further** delineate the vertical and horizontal extent of contaminants, and performing aquifer response tests to characterize subsurface hydrologic conditions. When additional field activities **are** required, a field change

request will be submitted to the Navy for approval, with notification to the USEPA and FDEP, [as members of the Tier 1 Team].

Table 4-1 Site 26 RI Sampling and Analytical Requirements			
Medium	No. of Samples ^a	Analytical Parameter	DQO ^b Level
Soil ^c	20	FSA	IV
	(2)	PPS	IV
	(1)	GS	IV
Groundwater ^d	4	FSA	IV
	(1)	PPW	IV
TOTAL	24	FSA	IV
	(3)	PPS/PPW	IV
	(1)	GS	IV

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 = 5 soil borings x 4 sample intervals = 20 samples.
- d Total number of groundwater samples = 4 proposed shallow monitoring wells x 1 sample each = 4 samples.

FSA — Full Scan of Analysis

Target Compound List (TCL) volatile organic compounds (VOCs), TCL base-neutral/acid extractable organic compounds (BNAEs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals (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)

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

The USEPA CLP TAL/TCL will be used to provide a legally defensible full spectrum of contaminant analysis. Soil and groundwater will be analyzed for the full TAL/TCL list with additional non-CLP analysis also being conducted when warranted, in accordance with

Section 10 of the CSAP. [**Special analytical services will be performed on specific analytes, in order to achieve lower quantitation and detection limits, as needed.**]

The list of remedial/physical characteristic parameters proposed in the E&E site work plan (1992) has been modified. Changes were made to the proposed analyses to address the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) rather than Resource Conservation and Recovery Act (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 an **FS** 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 that is not legally defensible, or have limited use.

New Analytical Organization

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

total phosphorus, nitrate-N, **TKN**, and heterotrophic plate count. Additional sample volume will be collected for the **PPW** samples.

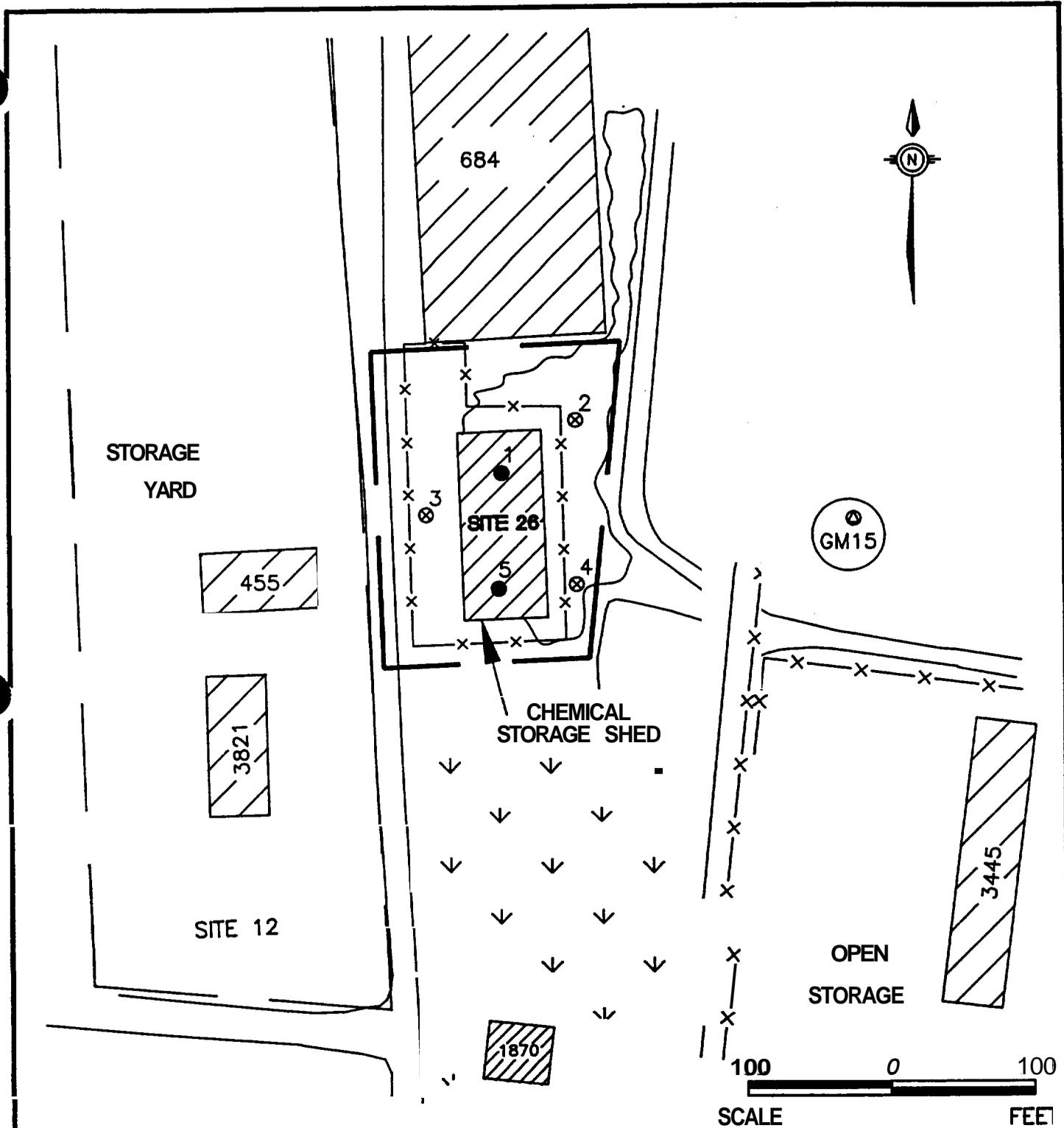
4.3 Sample Locations

The sample locations, presented in Figure 4-1, are five **soil** borings and four permanent monitoring wells. These locations were agreed to by the Navy, USEPA, and **FDEP**. **Soil** and groundwater samples will be collected for **FSA** to identify the presence or absence of contaminants at the site. Contaminants identified in this phase will be compared to the previously cited **PRGs** established for each contaminant. The investigation will proceed to evaluate extent only if contaminants exceed their respective **PRGs**.

Soil Samples — An FSA will be conducted on approximately 20 **soil** samples collected from five soil **boring** locations. All boring locations will be sampled at the following intervals: 0 to 1 feet below land surface (bls), 3 to 5 feet bls, 8 to 10 feet bls, etc. from the land surface to the depth of the water table, estimated to be 18 feet bls. Also two samples [(one above, and the other below, the water table)] will be analyzed for **PPS**, and one sample will be analyzed for **GS**, to yield data for the FS.

soil samples, for FSA, 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 to characterize and evaluate potential **contamination**.

Groundwater Samples — An FSA will be conducted on groundwater samples collected from four shallow monitoring wells. The wells will be completed to a target depth of 30 feet bls. One of the groundwater samples will also be analyzed for **HEX** to provide data for remediation and **risk** assessment. Also, one sample will be analyzed for **PPW** for the Feasibility Study.



LEGEND

- APPROXIMATE SITE BOUNDARY
- TREES
- EXIST. SHALLOW MONITORING WELL
- FENCE
- SOIL BORING/SHALLOW MONITORING WELL
- SOIL BORING
- GRASS
- BUILDING



**SAMPLING AND ANALYSIS PLAN
NAS PENSACOLA
PENSACOM, FLORIDA**

**FIGURE 4-1
PROPOSED SAMPLING LOCATIONS
SITE 26**

4.4 Sampling Procedures

Proposed sampling procedures are presented in Sections 4, **5**, and 6 of the CSAP. General sampling requirements will adhere to Section 2.2 of the CSAP with sample processing **performed** in accordance with Section 12. A brief description of the sampling procedures and any proposed procedure modifications to the CSAP or E&E site work plan (1992) are discussed below. **All** samples collected for HEX analysis will only be collected in the afternoon on Monday through Thursday due to a 24-hour holding time.

4.4.1 Soil Sampling

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

4.4.2 Monitoring Well Installation and Development

Monitoring well borings will be advanced using hollow-stem auger drilling techniques. The drilling methods and monitoring well installation procedures will adhere to 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. Due to the possible presence of floating contaminants, shallow monitoring wells will be installed so the well screen brackets the water table.

At least 24 hours after monitoring well installation is complete, they will be developed in accordance with Section 5.4 of the CSAP. **Monitoring** well development will continue until the water withdrawn is **as** free of turbidity as possible based on the subsurface lithology 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**.

4.4.3 Groundwater Sampling

Due to the depth to ground water a grundfos pump [(~~as~~ opposed to peristaltic)] operating at a low flow rate will be used to provide quiescent sampling. **[The sampling will be performed in accordance with Section 6.3 of the CSAP].** Field measurements to be recorded during groundwater sampling include pH, temperature, turbidity, specific conductance, groundwater level, and organic vapor detection. These measurements will be recorded in accordance with Section 10.1 of the *CSAP*.

4.5 Hydrologic Assessment

Groundwater levels will be measured ~~from~~all the monitoring wells installed for Site 26 on the same day, at approximately the same time. These will be contoured to allow easy interpretation of the groundwater flow patterns under the site. In addition, a specific capacity test and/or a slug test will be **performed** to provide a first estimate of the surficial zone's hydraulic conductivity.

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*.

4.7 Geodetic Survey

A geodetic survey ~~of~~ the locations of the ~~soil~~ borings and monitoring wells 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 (**IDW**) will be **handled** in **accordance** with Section 13 of the *CSAP*, and the **IDW** management Plan for NAS Pensacola.

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**. **QNQC** procedures to be followed during the investigation 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 26 RI.

6.0 DATA MANAGEMENT PLAN

The Data Management Plan presented in Section 14 of the CSAP will be followed during the Site 26 RI.

7.0 REFERENCES

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