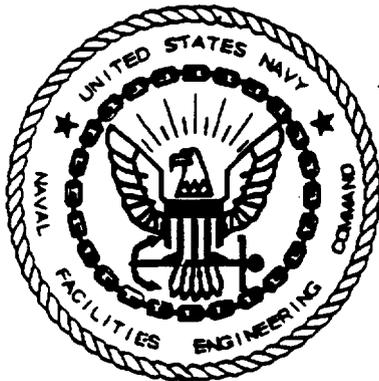


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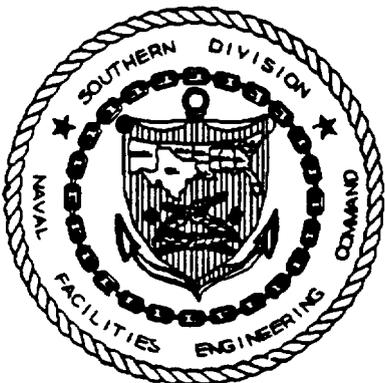
Comprehensive Long-Term
Environmental Action
Final Sampling and Analysis Plan
for Site 15
Pesticide Rinseate ~~Disposal Area~~
Naval *Air Station*
Pensacola, Florida



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Pensacola, Florida



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October 21, 1996

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

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19. Abstract

This Sampling and Analysis Plan is written for Site 15, the Pesticide Rinsate Disposal Area. The purposes of this investigation are to delineate the nature, magnitude and to the greatest degree practicable, extent of contaminated soil and groundwater; to determine the risk to human health and the environment; and to determine the need for site remediation.

Investigative work will be completed through a three-phased approach consisting of soil borings, temporary monitoring wells, permanent monitoring wells, and collection of soil and groundwater samples for Target Analyte List/Target Compound List using Contract Laboratory Program protocol. In addition, Special Analytical Services on specific analytes may be performed to achieve lower quantitation limits as needed. Except for the omission of a neat cement grout collar, temporary monitoring wells will be constructed, developed, and sampled in accordance with the procedures for permanent monitoring wells. Therefore, the necessity for installation of permanent monitoring wells should be evaluated on a site by site basis by the Navy, U.S. Environmental Protection Agency and Florida Department of Environmental Protection.

Phase I activities will identify if contaminants are present at the site. The detected concentrations of soil contaminants will be compared to both the risk-based concentrations for residential land (developed by EPA Region III) and the risk-based cleanup goals for Florida developed by FDEP September 29, 1995. The most recent RBC tables are used, these are January-June, 1996. Groundwater contaminants will be compared the Florida Drinking Water Standards and Guidance Concentrations, or the Safe Drinking Water Act Maximum Concentration Levels. If groundwater contamination, or the potential exists for soil contaminants to leach to groundwater, site-specific soil actions levels will be developed for each contaminant. Further assessment activities will depend on whether soil and groundwater samples exceed the applicable PRGs. A brief data presentation summarizing the findings of the first phase of the investigation presenting PRGs and outlining additional work will be prepared following receipt and evaluation of the analytical data.

Phase II of the investigation will be implemented for plume/soil contamination delineation (contaminants above the PRGs) through installation of additional temporary monitoring wells/soil borings. A data presentation will summarize the findings of the Phase II plume delineation and recommend locations for permanent monitoring wells for confirmation sampling.

Phase III permanent monitoring wells (and soil borings, if required) will replace strategically located temporary monitoring wells and be used to confirm contamination delineation and risk assessment.

This Sampling and Analysis Plan, 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, abbreviations, and units of measure used in this report.

bls	below land surface
CGs	Cleanup Goals
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
CSAP	Comprehensive Sampling and Analysis Plan
DQO	Data Quality Objective
E/A&H	EnSafe/Allen & Hoshall
E&E	Ecology and Environment, Inc.
FDEP	Florida Department of Environmental Protection
FS	Feasibility Study
FSA	Full Scan of Analysis
G&M	Geraghty and Miller, Inc.
GS	Grain <i>Size</i>
IAS	Initial Assessment Study
IDR	Interim Data Report
msl	Mean Sea Level
NAS Pensacola	Naval Air Station Pensacola
NEESA	Naval Energy and Environmental Support Activity
NFESC	Naval Facilities Engineering Service Center (formerly NEESA)
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	polychlorinated biphenyls
PPS	Physical Parameters, Soil
PPW	Physical Parameters, Water
PRGs	Preliminary Remedial Goals
QA	Quality Assurance
QC	Quality Control
RBC	Risk-Based Concentrations
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SDWA	Safe Drinking Water Act
SOP/QAM	Standard Operating Procedures and Quality Assurance Manual
SOUTHNAVFACENGCOM	Southern Division, U.S. Navy, Naval Facilities Engineering Command
svocs	Semivolatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TKN	Total Kjeldahl Nitrogen

TOC
TRPHs
USEPA
VOCS

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

EXECUTIVE SUMMARY

This Sampling and Analysis Plan is written for Site 15, the Pesticide Rinsate Disposal Area. The purposes of this investigation are to delineate the nature, magnitude and, to the greatest degree practicable, extent of contaminated soil and groundwater; to determine the risk to human health and the environment; and to determine the need for site remediation.

Investigative work will be completed through a three-phased approach consisting of soil borings, temporary monitoring wells, permanent monitoring wells, and collection of soil and groundwater samples for Target Analyte List/Target Compound List using Contract Laboratory Program protocol. In addition, Special Analytical Services on specific analytes may be performed to achieve lower quantitation limits as needed. Except for the omission of a neat cement grout collar, temporary monitoring wells will be constructed, developed, and sampled in accordance with the procedures for permanent monitoring wells. Therefore, the necessity for installation of permanent monitoring wells should be evaluated on a site by site basis by the Navy, U.S. Environmental Protection Agency and Florida Department of Environmental Protection.

Phase I activities will identify if contaminants are present at the site. The detected concentrations will be compared to the preliminary remediation goals established for NAS Pensacola. The detected concentrations of soil contaminants will be compared to both the risk-based concentrations for residential land (developed by EPA Region III) and the risk-based cleanup goals for Florida (developed by FDEP September 29, 1995). The most recent RBC tables are used, these are January-June, 1996. Groundwater contaminants will be compared the Florida Drinking Water Standards and Guidance Concentrations, or the Safe Drinking Water Act Maximum Concentration Levels. If groundwater contamination, or the potential exists for soil contaminants to leach to groundwater, site-specific soil actions levels will be developed for each contaminant. Further assessment activities will depend on whether soil and groundwater samples exceed the applicable PRGs. A brief data presentation summarizing the findings of the first phase of the investigation presenting PRGs and outlining additional work will be prepared following receipt and evaluation of the analytical data.

Phase II of the investigation will be implemented for plume/soil contamination delineation (contaminants above the PRGs) through installation of additional temporary monitoring wells/soil borings. A data presentation will summarize the findings of the ~~Phase~~ II plume delineation and recommend locations for permanent monitoring wells for confirmation sampling.

Phase III permanent monitoring wells (and soil borings, if required) will replace strategically located temporary monitoring wells and be used to confirm contamination delineation and risk assessment.

This Sampling and Analysis Plan, 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 Remedial Investigation/Feasibility Study (RI/FS) will be completed by EnSafe/Allen & Hoshall (E/A&H) at Site 15 — the Pesticide ~~Rinsate~~ Disposal Area, 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-0318/07.

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 D* (Site 15) completed by Ecology & Environment, Inc. (E&E 1992). References to these documents are made throughout this plan. The investigation of Site 15 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 15 **RI** will assess the nature of any potential contamination identified during past and proposed field investigations [**and assess the need for site remediation**]. The results of the previous Phase I investigations are outlined in the *Interim Data Report (IDR), Contamination Assessment/Remedial Investigation, Pesticide Rinsate Disposal Area (Site 15)* (E&E 1991). A well inventory, contaminant source survey, and habitat and biota survey will be conducted before field activities begin. Field activities to be performed during the RI include the completion of soil borings and monitoring wells, the collection of soil and groundwater samples, and a **phase I** ecologic assessment [**as defined in the CSAP**]. Chemical analyses will be completed

by a laboratory approved by the Naval Facilities Engineering Service Center (NFESC) 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.] Field sampling, analytical methods, and reporting **will** be conducted at USEPA Level IV protocol.

[Investigative work **will** be completed through a three-phased approach consisting of **soil** borings, temporary monitoring wells, permanent monitoring wells, and collection of **soil** and groundwater samples for Target Analyte List/Target Compound **List** (TAL/TCL) analyses using CLP protocol. Except for the omission of a neat cement grout collar, temporary monitoring wells **will** be constructed, developed, and sampled in accordance with the procedures for permanent monitoring wells. Therefore, the necessity for installation of permanent monitoring wells should be evaluated site by site by the Navy, USEPA and Florida Department of Environmental Protection (FDEP).

Phase I activities will identify if contaminants are present at the site. The detected concentrations of soil contaminants **will** be compared to both the risk-based concentrations (RBCs) for residential land (developed by EPA Region III) and the risk-based cleanup goals (CGs) for Florida (developed by FDEP September **29, 1995**). The most recent RBC tables are used, these are January-June, 1996. 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 groundwater contamination, or the potential exists for soil contaminants to leach to groundwater, site-specific soil actions levels will be developed for each contaminant. Further assessment activities will depend on whether soil and groundwater samples exceed the applicable PRGs. A brief data presentation summarizing the findings of the first phase of the investigation

A brief data presentation summarizing the findings of the first phase of the investigation presenting PRGs and outlining additional work will be prepared following receipt and evaluation of the analytical data.

Phase II of the investigation will be implemented for plume/soil contamination delineation (contaminants above the PRGs) through installation of additional temporary monitoring wells/soil borings. A data presentation will summarize the findings of the Phase II plume delineation and recommend locations for permanent monitoring wells.

Phase III permanent monitoring wells (and soil borings, if required) will replace strategically located temporary monitoring wells and be used to confirm contamination delineation and risk assessment.]

Upon completion of the investigative work and laboratory analysis, an RI report [including the baseline risk assessment] will be submitted to the USEPA and Florida Department of Environmental Protection (FDEP) summarizing the activities, results and conclusions of the investigation. The report will provide supporting data for the completion of the Feasibility Study (FS) to be completed for Site 15.

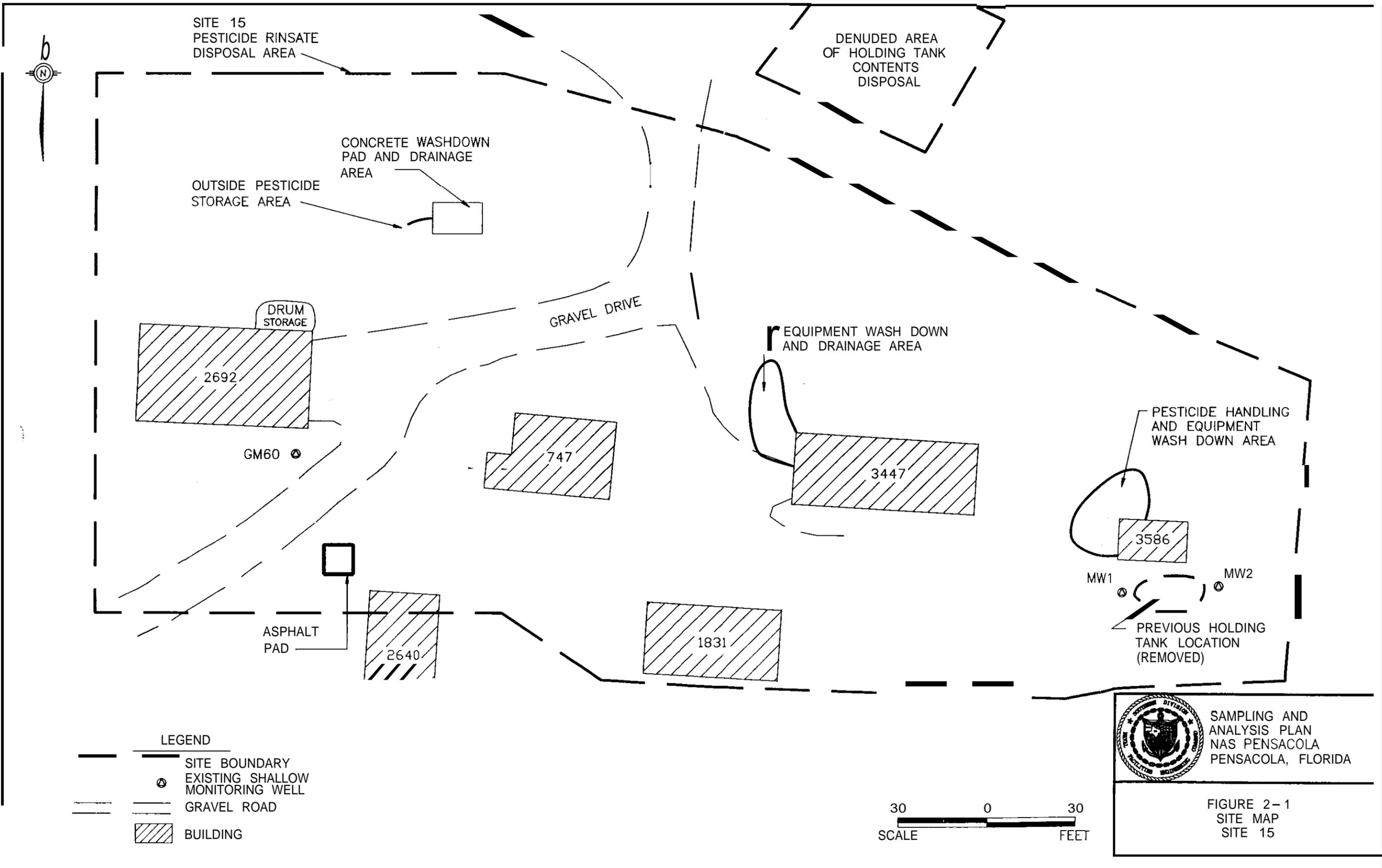
This SAP, in conjunction with the CSAP, will provide guidelines for sampling and analytical techniques to be used during the RI and outline proper documentation procedures for the investigation.

2.0 BACKGROUND INFORMATION

2.1 Site Description

Site **15** is located inside the golf course maintenance area of **NAS** Pensacola, approximately 600 feet south of Bayou Grande (see Figure **2-1**). The site area is unpaved except for two wash pads, one asphalt and one concrete, covering approximately **36 and 120 square** feet, respectively. Several buildings [are] in the immediate vicinity (Buildings **2692, 2640, 747, 1831, 3447, and 3586**) with access to the site via an unpaved gravel road. Potential contaminant **source** areas include [pesticide/drum storage areas in and around Building **2692**; four equipment rinsate /pesticide handling areas (the asphalt pad northwest of Building **2640**, the concrete pad northeast of Building **2692**, and areas adjacent to Buildings **3447** and **3586**); equipment storage shed-Building **2640**; and a nearby area where underground holding **tank** contents have been disposed.]

There are [four] existing monitoring wells onsite. [Two wells, **GM-59** and **GM-60**, were installed near Building **2692** as part of the **1986** Characterization Study conducted by Geraghty and Miller, Inc. (G&M). Two additional wells were installed in approximately **1993** near Building **3586** during the closure of an underground holding tank (Rettew, personal communication **1995**).] Well **GM-59** is **17** feet deep, and well **GM-60** is **15** feet deep. [No construction details are currently known for the more recently installed wells.] Construction details for the two GM wells are presented in Table **2-1**.



SITE 15
PESTICIDE RINSATE
DISPOSAL AREA

DENUDED AREA
OF HOLDING TANK
CONTENTS
DISPOSAL

CONCRETE WASHDOWN
PAD AND DRAINAGE
AREA

OUTSIDE PESTICIDE
STORAGE AREA

GRAVEL DRIVE

EQUIPMENT WASH DOWN
AND DRAINAGE AREA

PESTICIDE HANDLING
AND EQUIPMENT
WASH DOWN AREA

DRUM
STORAGE

GM60

2692

747

3447

3586

MW1

MW2

ASPHALT
PAD

2640

1831

PREVIOUS HOLDING
TANK LOCATION
(REMOVED)

Table 2-1					
Construction Details of Monitoring Wells on Site 15					
Well Designation	Surface Elevation (ft msl)	TOC Elevation (ft msl)	Total Depth Drilled (ft)	Screened Interval (ft)	Depth to Filter Pack (ft)
GM-59	16.0	16.54	17.0	14.5-17.0	8.0
GM-60	15.0	17.51	15.0	12.5-15.0	10.0

Source: Geraghty & Miller, inc. 1986

Notes:

TOC = Top of Casing
 msl = mean sea level

Building 3586, located approximately 375 feet east of Building 2692 in the golf course maintenance area, has been and is currently used for the storage, mixing, and disposal of pesticides. [Previously,] a sink on the outside of the building and a drain in a concrete pad north of the building both discharged into the holding tank. The [tank] contents were periodically pumped out by a contracted agent [prior to the tank's removal in approximately 1993.1

2.2 Site History

From 1963 until 1979, Site 15 was used for the storage of pesticides and the cleaning of pesticide mixing and application equipment. Building 2692 and an outdoor area near the northeast corner of the building were used for the storage of pesticides (NEESA 1983). Neither the floor of the building nor the outdoor area are cemented or paved, thus creating the potential for direct infiltration of spilled or leaking pesticides. This building is currently used to store fertilizers.

Equipment cleaning operations at the asphalt [**and concrete wash** pads] involved the disposal of dilute rinsate solutions directly onto the **ground** surface surrounding the pad. These rinsates were allowed to infiltrate into the soil, and reportedly contained organic phosphates, chlorinated hydrocarbons, carbaryl, and carbamates (**G&M 1986**).

Previous environmental studies of the site were conducted under the Navy Assessment and Control of Installation Pollutants program. Former environmental investigations by the Navy include an Initial Assessment Study (IAS) conducted in **1983** and a two-part Confirmation Study.

The IAS evaluated Site **15** based on historical records, field inspections, and interviews with NAS Pensacola personnel. The study concluded discarded pesticide rinsates were not sufficiently concentrated to constitute a threat to human health or the environment. Further study was not recommended at the site. Since environmental sampling and laboratory analyses were not performed, the information for a thorough assessment of the [nature,] magnitude and extent of residual contamination was not available.

In 1984, G&M was retained by the Navy to perform a Confirmation Study at NAS Pensacola. The Confirmation Study consisted of a Verification Study and a subsequent Characterization Study. Neither study indicated the presence of extensive pesticide or other contamination at Site **15** (**G&M 1984, 1986**).

E&E performed a Phase I investigation of Site **15** to identify [potential **contaminants and areas** of concern]. The results are detailed in the **E&E IDR (1991)**. Soil and groundwater samples were collected during the investigation and submitted for laboratory analysis. Metals (particularly arsenic), total recoverable petroleum hydrocarbons (TRPHs), volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and pesticides were detected

in the soil. Detected in the groundwater samples were metals (particularly **arsenic**) and **Dieldrin/4,4-DDE**. Limited additional assessment was recommended for Site **15**.

Equipment rinsing and pesticide handling are currently performed in areas adjacent to Buildings **3447** and **3586**, where rinsate solution and product spillage may have impacted local soil and groundwater. The underground rinsate holding **tank** located south of Building **3586** was removed along with associated **soil** during approximately **1993**. After analytical testing, the contents of the removed **tank** were spread across a nearby portion of the golf course, approximately **200** feet northeast of the site.]

2.3 Physical Setting

Climatology, biological resources, physiography, and hydrogeology for Site **15** 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 [were] conducted at Site **15** as part of **E&E's** Phase I activities. These include aerial photograph analysis, site reconnaissance, **surface/particulate** air emissions survey, a habitat and biota survey, and a geophysical survey. Results of the physical surveys are presented in Section 3 of the IDR (**E&E 1991**). Relevant information from these surveys has been considered during the planning of **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 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

The 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, aerial photograph analysis and a utility survey.

The survey will include, to the greatest extent possible, the identification of the following:

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

Habitat and Biota Survey

A Phase I habitat and biota survey will be performed **in** accordance with Section **8** of the **CSAP**. Information collected during the **E&E Site 15** investigation (**1991**) and data obtained during the Site **15** RI will be used to 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 for Site **41** (NAS Pensacola wetlands). **If** ecological impacts to wetland areas adjacent to Site **15** are suspected based on Site **15** and Site **41** Phase **I** data, Phase **II** sampling of the wetlands will be performed during the Site **41** **RI** and in accordance with the Final RI/FS Work Plan for Site **41**. **If** other ecological impacts (terrestrial) are suspected at Site **15** 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 the sampling and field measurement procedures to be used during the RI. The field investigation includes advancing soil borings, installing **[temporary/permanent]** groundwater monitoring wells, and collecting soil 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:

Phase I

- Identify potential sources of contamination.
- Assess the nature of identified contaminants.

Phase II

- Delineate, **[to the greatest extent practicable,]** the extent of soil and groundwater contamination.
- Delineate migration pathways of the contaminants.
- Identify potential receptors of the contaminants.
- Assess the need for site remediation.

Phase III

- Establish permanent monitoring well locations to confirm presence of contamination and monitor contaminant migration.

4.2 Sampling and Analytical Requirements

The sampling and analytical requirements are summarized in Table 4-1 and discussed below. The proposed number of **[Phase I]** soil and groundwater samples is also listed in Table 4-1.

Table 4-1 Site 15 RI Sampling and Analytical Requirements			
Medium	No. of Samples	Analytical Parameter	DQO^a Level
Soil ^b	[96]	FSA	IV
Groundwater ^c	[10]	FSA	IV
TOTAL	[106]	FSA	IV

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

Notes:

- a **DQO** = Data Quality Objective
- b Total number of soil samples = [24] soil borings x 4 sample intervals = [96] samples.
- c Total number of groundwater samples = [10] monitoring wells ([4] existing monitoring wells + [6] proposed [temporary] shallow monitoring wells) x 1 sample each = [10] samples.

FSA — Full Scan of Analysis

Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals (unfiltered), and TCL cyanide.

[Proposed Phase II samples will be included in the data presentation following Phase I.]

The 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 **[collecting]** 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 in groundwater, and **[performing]** additional aquifer response tests to characterize subsurface hydrologic conditions, where allowable. 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 and groundwater will be analyzed for the full TAWTCL list with additional non-CLP analysis also 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 (OU 10, Site 1, and Site 39)** and evidence from the site ~~history~~ that **this is** not a parameter of concern.

Samples for physical parameters and grain-size analyses will be collected from selected soil and groundwater sampling locations during Phase II. The number of samples will be detailed in the Phase I data presentation.]

Analyses proposed in this **SAP** have been [reorganized since] the **E&E** site work plan (1992) which subdivided [them] into "Suites A through E." 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. Proposed analytical parameters are now organized into the five basic groups listed below.

New Analytical Organization

- Full Scan of Analysis (FSA) — A full scan consists of analysis for TCL VOCs, TCL semivolatile organic compounds (SVOCs), TCL pesticides, TCL polychlorinated biphenyls (PCBs), TAL metals (unfiltered), and TCL cyanide.

- e 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. [Samples for *these analyses* will be collected during Phase II.]

- e Grain Size Analysis (GS) — [Samples for these analyses **will be** collected during Phase II.]

- 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, TKN, and heterotrophic plate count. [Samples for these analyses will be collected during Phase II.]

4.3 Sample Locations and Rationale

[The proposed field investigation will consist of a three-phased approach. Phase I locations, presented in Figure 4-1, will consist of **24** soil borings and **six** temporary monitoring wells. Soil and groundwater samples will be collected for **FSA** to identify the presence or absence of contaminants at the site. **Contaminants** detected in this phase will be compared to **risk**-based PRGs or promulgated standard established for each contaminant. The investigation will proceed to delineate extent only if **contaminants** are found to exceed their respective PRGs. If contaminants are not detected above PRGs, Phase II will consist of installation of permanent monitoring wells (if necessary) to confirm analytical results from the temporary monitoring wells. If **contaminants** are detected above **PRGs**, **Phase II** will consist of installation of additional soil borings/**temporary** monitoring wells until adequate delineation of contamination to **assess** the need for site remediation is established. Following an evaluation of the data, Phase III permanent monitoring wells and soil borings will be installed to replace temporary monitoring wells at locations selected to confirm



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DRUM
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GRAVEL DRIVE

EQUIPMENT WASH DOWN
AND DRAINAGE AREA

PESTICIDE HANDLING
AND EQUIPMENT
WASH DOWN AREA

2692

747

3447

GM60

3586

MW1

MW2

ASPHALT
PAD

2640

1831

PREVIOUS HOLDING
TANK LOCATION
(REMOVED)

LEGEND

- ▲ TEMPORARY SHALLOW MONITORING WELL
- SOIL BORING
- SOIL BORING/ TEMPORARY SHALLOW MONITORING WELL
- ⊙ EXISTING SHALLOW MONITORING WELL

— SITE BOUNDARY
— GRAVEL ROAD

▨ BUILDING

30 0 30
SCALE FEET



SAMPLING AND
ANALYSIS PLAN
NAS PENSACOLA
PENSACOLA, FLORIDA

PROPOSED SAMPLING LOCATIONS
SITE 15

DWG DATE: 02/23/95 DWG NAME: 71SIT15B

nature and extent of contamination. Permanent wells **will** be used for possible long-term monitoring and **risk** assessment; locations will be based on current accessibility, and geometry of the contaminant plume. The sampling program and any proposed modifications to the E&E site work plan **(1992)** are described below.]

Soil Samples — FSA will be conducted on approximately **96** soil samples collected from **24** soil boring locations. All boring locations will be sampled at the following intervals: 0 to **1** feet below land surface (bls), [**1** to 3 feet bls, **5** to **7** feet bls, **9** to **11** feet bls], etc. from the land surface to the depth of the water table. The depth to water is estimated to be **10** feet bls.

[Additional soil borings will be installed if the contaminants are detected above their respective PRGs. Any soil samples collected during Phase **11** **will** not be analyzed for **FSA**, but for the contaminants positively identified above the PRGs in the **first** sampling phase. Confirmatory Phase III samples, if required, will be analyzed for **FSA**.]

PPS analyses [needed for the feasibility study will **be** conducted during Phase II only if the identified contaminants exceed the applicable PRGs.] **PPS** samples will be collected to represent both background and potentially contaminated conditions. **GS** analysis will [also depend on exceedances of the PRGs and will **be** conducted] on soil samples representative of the screened interval[s of the monitoring wells.] Results of the **GS** analysis will be used to calculate recovery well specifications if a groundwater remediation program is required.

Except for GS samples, 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.

Groundwater Samples — **FSA** will **be** conducted on groundwater samples collected from [10] monitoring wells ([four] existing and [six] proposed [temporary shallow] wells). [All] proposed wells will be shallow with a target depth of **15** feet bls.

[Additional temporary monitoring wells will **be** installed if contaminants are identified in groundwater above their respective PRGs or if additional delineation is required. Groundwater samples collected during Phase II will not be analyzed for **FSA**, but for the contaminants positively identified above the PRGs in the first sampling phase. Confirmatory Phase III samples will be analyzed for FSA.

PPW analyses will be conducted during Phase II only if the detected contaminants exceed the applicable PRGs for groundwater.] Samples collected for [**PPW** analyses will] represent both background and potentially contaminated conditions.

4.4 Sampling Procedures

Proposed sampling procedures are presented in Sections **4**, **5**, and **6** 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 modifications to the **CSAP** or E&E site work plan (**1992**) are discussed in the following subsections.

4.4.1 Soil Sampling

Soil borings will be advanced using hollow-stem auger drilling techniques [or with a stainless-steel hand auger], **as** appropriate. Soil samples will **be** collected using split-barrel samplers in accordance with Section **4.6.1** of the **CSAP**. [Samples from hand augered boreholes will be collected directly from the auger bucket using stainless-steel bowls and spoons.]

4.4.2 Monitoring Well Installation and Development

Monitoring well borings will be advanced using hollow-stem auger drilling techniques. Drilling methods and [permanent] 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 [will be used for all permanent] monitoring well installations. Because of possible floating contaminants, [temporary and permanent shallow] monitoring wells will be installed so the well screen brackets the water table. [The temporary wells, with the exception of a grout collar, will be constructed in a manner identical to the permanent wells.]

Monitoring wells will be developed in accordance with Section 5.4 of the CSAP. [Temporary monitoring wells will be developed using peristaltic pumps following an initial purging of coarse sediment-laden water using centrifugal pumps.] Monitoring well development [both temporary and permanent monitoring wells,] will continue until the withdrawn water is as free of turbidity as possible based on the [lithology] of the [screened interval] 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

Groundwater sampling will be performed in accordance with Section 6 of the CSAP. [Peristaltic pumps will 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 F1.3 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

[An initial water level assessment will be performed **utilizing** the temporary wells during the Phase I portion of the investigation to determine shallow groundwater elevations, shallow groundwater flow **direction(s)**, and hydraulic **gradient(s)**.] A hydrologic [characterization] assessment will be performed [on the permanent monitoring wells installed during Phase **III**] in accordance with Section 9.6 of the **CSAP**. 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 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**.

4.6 Ecologic 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 Cadastral Survey

[A geodetic survey will be performed using a global positioning system 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 (QA/QC) 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 **15 RI**.

6.0 DATA MANAGEMENT PLAN

The Data Management Plan presented in Section **14** of the **CSAP** will be followed during the Site **15 RI**.

7.0 REFERENCES

Ecology and Environment, Inc. (1992). *Contamination Assessment/Remedial Activities Investigation Work Plan — Group D, Naval Air Station Pensacola, Pensacola, Florida*. Ecology and Environment, Inc.: Pensacola, Florida.

Ecology and Environment, Inc. (1991). *Interim Data Report, Contamination Assessment/Remedial Investigation, Pesticide Rinsate Disposal Area (Site 15), Naval Air*

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EnSafe/Allen & Hoshall. (1994). *Comprehensive Sampling and Analysis Plan For Naval Air Station Pensacola, Pensacola, Florida — Final.* **EnSafe/Allen & Hoshall: Memphis, Tennessee.**

Geraghty and Miller, Inc. (1984). *Verification Study, Assessment of Potential Groundwater Pollution at Naval Air Station, Pensacola, Florida.* **Geraghty and Miller: Tampa Bay, Florida.**

Geraghty and Miller, Inc. (1986). *Characterization Study, Assessment of Potential Groundwater Pollution at Naval Air Station, Pensacola, Florida.* **Geraghty and Miller: Tampa Bay, Florida.**

Naval Energy and Environmental Support Activity (NEESA). (1983). *Initial Assessment Study of Naval Air Station, Pensacola, Florida.* **NEESA 13-015.**

Rettew, C. (1995). *Golf Course Maintenance Supervisor, personal communication.*

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.**

Appendix A
Florida Professional Geologist Seal

FLORIDA PROFESSIONAL GEOLOGIST SEAL

I have read and approve of this Sampling and Analysis Plan, NAS Pensacola Site **15**, 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: Brian E. Caldwell
License Number: #1330
State: Florida
Expiration Date: July 31, 1998

Brian E. Caldwell
Brian E. Caldwell

10/21/96
Date