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FINAL RECORD OF DECISION FOR OPERABLE UNIT 5 (OU 5) SITE 49 FORMER SKEET RANGE NAS CECIL FIELD FL

8/14/2006

TETRA TECH NUS INC

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-94-D-0888

Record of Decision
for
Operable Unit 5, Site 49
Former Skeet Range

Naval Air Station Cecil Field
Jacksonville, Florida

Contract Task Order 0226

August 2006

Naval Facilities Engineering Command
Southeast
2155 Eagle Drive
North Charleston, South Carolina 29406

TETRA TECH NUS, Inc.

060409/P

RECORD OF DECISION
OPERABLE UNIT 5, SITE 49
FORMER SKEET RANGE

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command
Southeast
2155 Eagle Drive
North Charleston, South Carolina 29406

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AUGUST 2006

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This document that describes the Record of Decision for Operable Unit 5, Site 49, Former Skeet Range at Naval Air Station Cecil Field, Jacksonville, Florida has been prepared under the direction of a Florida-registered professional engineer. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards of practice.

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ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
ARAR	Applicable or relevant and appropriate requirement
BaP	Benzo(a)pyrene
BaPEq	BaP equivalent
BCT	BRAC Cleanup Team
bgs	Below ground surface
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Chemical of concern
cPAH	Carcinogenic PAH
EBS	Environmental Baseline Survey
EE	Envirodyne Engineers
EE/CA	Engineering Evaluation/Cost Analysis
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FFA	Federal Facility Agreement
FS	Feasibility Study
GIR	General Information Report
G&M	Geraghty and Miller, Inc.
HLA	Harding Lawson Associates
HQ	Hazard quotient
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IBDS	Inorganic Background Data Set
IR	Installation Restoration
mg/kg	Milligram(s) per kilogram
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No further action
NPL	National Priorities List
NPW	Net present worth
O&M	Operating and maintenance

OU	Operable Unit
PAH	Polynuclear aromatic hydrocarbon
PRG	Preliminary Remediation Goal
PSC	Potential Source of Contamination
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper confidence limit
U.S. EPA	United States Environmental Protection Agency
yd^3	Cubic yard(s)

1.0 DECLARATION OF THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION

Operable Unit (OU) 5, Site 49 consists of the contaminated soil identified at the location of the former skeet range at Building 804 at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida [United States Environmental Protection Agency (U.S. EPA) ID FL5 170 022 474, Superfund Site Identification Number 0404743]. Site 49 is located near the western edge of the Main Base.

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the selected remedial action for OU 5, Site 49 at NAS Cecil Field. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [40 Code of Federal Regulations (CFR) 300]. This decision document was prepared in accordance with U.S. EPA decision document guidance (U.S. EPA, 1999). This decision was based on information contained in the Administrative Record for the site, which is located at the former Memorial Chapel, 6112 New world Avenue, Cecil Commerce Center, Jacksonville, Florida, 32221. The United States Department of the Navy (hereinafter the Navy) and U.S. EPA Region 4 select the remedy of No Further Action (NFA). The Florida Department of Environmental Protection (FDEP) concurs with the selected remedy.

1.3 DESCRIPTION OF THE SELECTED REMEDY

The Navy and U.S. EPA, with the concurrence of FDEP, have determined that NFA is required to ensure protection of human health and the environment at OU 5, Site 49.

1.4 STATUTORY DETERMINATIONS

The two previous soil removal actions at OU 5, Site 49 have eliminated the need for further action at the site. The measured level of risk to human health and the environment following the removal actions allow for unrestricted use and unlimited exposure. Because no contaminants remain on site at concentrations of concern, CERCLA Five-Year Reviews of the site are not required.

1.5 AUTHORIZING SIGNATURES

Jim R. Ferro, P.E.
Director
BRAC Program Management Office Southeast

September 21, 2006
Date

Beverly H. Banister
Acting Director
Waste Management Division
U.S. EPA Region 4

9-26-06
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

OU 5, Site 49 is situated within the boundaries of the former NAS Cecil Field (U.S. EPA ID FL5 170 022 474), which is located 14 miles southwest of Jacksonville, Florida (see Figure 2-1). The majority of Cecil Field is located within Duval County, and the southernmost part of the facility is located in Clay County. NAS Cecil Field was established in 1941 and provided facilities, services, and material support for the operation and maintenance of naval weapons, aircraft, and other units of the operation forces as designated by the Chief of Naval Operations. Since the closure of NAS Cecil Field in September 1999, most of the facility has been transferred to the Jacksonville Port Authority (now Jacksonville Aviation Authority) and the City of Jacksonville. According to the City's reuse plan, Cecil Field will have multiple uses but will be used primarily for aviation-related activities.

OU 5, Site 49 consists of the contaminated soil identified at the location of a former skeet range at NAS Cecil Field. As shown in Figures 2-1 and 2-2, Site 49 is located on the western edge of the Main Base area of NAS Cecil Field, south of Lake Newman Street (formerly 6th Street). Perimeter Road forms the western border of the site. Site 49 consisted of Building 804, Building 807, five small unnamed buildings, a former skeet range, and a forested area south of the former skeet range. The areas of the former skeet range and the forest are approximately 4 acres and 5 acres, respectively. Building 807 was the skeet range office, and the five unnamed buildings were used for storage and launching of clay pigeons. The site was used from 1965 to 1998 as a skeet shooting range. The site is currently inactive, and the reuse plan indicates that it is in an area that will be assigned for Park/Buffer uses.

Site 49 was referred to in the BRAC NAS Cecil Field Environmental Baseline Survey (EBS) (ABB-ES, 1994) as Building 804 – Skeet Range and Building 807 – Skeet Range Office. Building 804 was color coded 7/Gray in the EBS because of its use as a skeet range with the potential for lead contamination in the soil. Building 807 was considered an NFA site and color coded 1/White in the EBS. After the EBS, the former skeet range was referred to as Potential Source of Contamination (PSC) 49. From June 1999 to May 2001, Tetra Tech NUS, Inc. (TtNUS) performed field investigations for the assessment of surface and subsurface soil and groundwater at PSC 49. Based on the extent and type of contamination, the investigation was moved into the CERCLA program and the BCT redesignated PSC 49 as an Installation Restoration (IR) site within OU 5.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The first environmental studies for the investigation of waste handling and/or disposal sites at NAS Cecil Field were conducted between 1983 (G&M, 1983) and 1985 (G&M, 1985). These studies were followed in 1985 by an Initial Assessment Study (IAS) (EE, 1985). A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) was completed in 1988 (HLA, 1988).

The U.S. EPA placed NAS Cecil Field on the National Priorities List (NPL) in December 1989. A Federal Facility Agreement (FFA) for NAS Cecil Field was signed by FDEP, U.S. EPA, and the Navy in 1990. Pursuant to the FFA, the Navy has conducted remedial investigations and response actions under CERCLA authority. OU 5 is one of 12 OUs that are included in the FFA to be addressed under the CERCLA program. A Hazardous and Solid Waste Amendments (HSWA) permit was issued on October 13, 1996. The HSWA permit was renewed on August 25, 2000 and is still in effect. The corrective actions otherwise required by the HSWA permit have been deferred to the CERCLA-program in accordance with the FFA.

2.2.1 Site 49 History

Based on historic aerial photographs, the area now known as Site 49 was unused and undeveloped until 1965. Between 1965 and 1998, Site 49 was used as a skeet shooting range. Building 807, the skeet range office, was constructed in 1971. In September 1999, following NAS Cecil Field closure and transfer of the base to civilian ownership, the area referred to as Site 49 was deactivated.

2.2.2 Site Investigations

The following investigations and studies have been conducted in and around Site 49:

- 1994 - During the BRAC EBS, the skeet range office (Building 807) was determined to be an NFA site, and the skeet range (Building 804) was determined to be a gray site because of its use as a skeet range with the potential for lead contamination in the soil (ABB-ES, 1994). Because of the potential for lead contamination, the EBS recommended further investigation.

- 1999 - 2001 - In January 1999, Building 804 was re-designated as PSC 49. From June 1999 through May 2001, a Phase II Sampling and Analysis program was conducted for the assessment of surface and subsurface soil and groundwater at PSC 49. Eight sampling events were conducted at the site to delineate the vertical and horizontal extent of soil contaminated with inorganics and PAHs (TtNUS, 1999a, 1999b, 1999c, 1999d, 1999e, 2000a, 2000b, and 2001a). No significant groundwater contamination was detected. However, numerous soil samples exhibited concentrations of

polynuclear aromatic hydrocarbons (PAHs) and lead in excess of FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1999) or NAS Cecil Field site-specific Inorganic Background Data Set (IBDS) values (HLA, 1998). Based on the extent and type of soil contamination found during the field investigations, PSC 49 was transferred into the CERCLA program, re-designated as IR Site 49, and grouped into OU 5.

- 2001 - 2002 - An Engineering Evaluation/Cost Analysis (EE/CA) for Site 49 was prepared in January 2002. Based on the results of the previous investigations, preliminary human health and ecological risk evaluations were performed, RAOs were developed, COCs for soil were identified, and Preliminary Remediation Goals (PRGs) were established. Remedial alternatives for soil were assembled, analyzed, and compared, and a recommended cleanup alternative was presented (TtNUS, 2002a).

- 2002 - An Action Memorandum for Site 49 was prepared in March 2002 to identify a need for a removal action, to present the remedial design for the chosen remedial alternative, and to describe and estimate the costs of the proposed removal action (TtNUS, 2002b). The proposed remedial action included the excavation and off-site disposal of PAH- and lead-contaminated soil to comply with residential land use standards. The recommended removal action would allow for unrestricted site use.

- 2002 - 2003 - Site 49 Soil Removal Action. During August and September 2002 and November and December 2003, 5,809 cubic yards (yd^3) (7,895 tons) of soil were excavated from 11 areas of contamination. The depths of the excavations ranged from 6 inches to 3 feet below ground surface (bgs). Prior to excavation, the soil was characterized for disposal. Based on this characterization, 949 tons of hazardous soil were direct loaded in tandem trailer trucks for transport to the Michigan Disposal Waste Treatment Plant, and 6,946 tons of non-hazardous soil were stockpiled and then loaded in tandem trailer trucks for transport to the Chesser Island Landfill. The excavation was then backfilled with certified clean fill before it was graded and seeded. Wetland restoration was performed, where applicable, in accordance with procedures outlined in the Action Memorandum. This removal action was documented in the Source Removal Report (CH2MHill, 2004).

- 2004 - 2005 - Additional Soil Investigation at Site 49. Based on FDEP's comments regarding their review of the 95-percent upper confidence limit (UCL) calculation in the Source Removal Report (CH2MHill, 2004), an additional investigation was conducted by TtNUS from July through November 2004 in the area of the sample locations identified as a concern by FDEP. The Removal Action Design Package (TtNUS, 2005) documented the additional investigation and proposed limits for an additional soil removal based on the University of Florida model (FL-UCL) for the UCL calculation. It

was agreed by the BCT that the proposed excavation would allow unrestricted reuse and that NFA for soils would be required at Site 49.

- 2005 - Additional Soil Removal Action at Site 49. During November 2005, 113 yd^3 (192.42 tons) of soil were excavated from two additional areas of contamination. The depth of the excavation was 1 foot bgs in both areas. Prior to excavation, the soil was characterized for disposal. A total of 192.42 tons of PAH-contaminated, non-hazardous soil was stockpiled and then loaded in trailer trucks for transport to the Chesser Island landfill. The excavation was then backfilled with certified clean fill prior to being graded and seeded. This removal action was documented in the Source Removal Report Addendum (CH2MHill, 2006).

- 2006 - Proposed Plan for Operable Unit 5, Site 49. In March 2006, a Proposed Plan (TtNUS, 2006) was prepared. The Proposed Plan recommended NFA as the selected remedial alternative for Site 49 and presented a rationale for the selection of this remedy.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Public notice of the availability of the Proposed Plan (TtNUS, 2006) was placed in the Metro section of the *Florida Times-Union* on March 7, 2006. A 30-day comment period was held from March 8 through April 7, 2006, during which comments were solicited from the community. Public comments and the responses to these comments are presented in the Responsiveness Summary provided in Appendix A.

Documents pertaining to OU 5, Site 49 are available to the public at the Information Repository located at the former Memorial Chapel, 6112 New World Avenue, Cecil Commerce Center, Jacksonville, Florida 32221 (Telephone 904-777-1900). This ROD will become part of the Administrative Record File [NCP §300.825(a)(2)].

2.4 SCOPE AND ROLE OF OPERABLE UNIT

The environmental concerns at NAS Cecil Field are complex. As a result, work at the 24 sites in the IR Program has been organized into 12 OUs. More than 200 other areas have undergone or are undergoing evaluation in the BRAC and Petroleum Programs.

This ROD is the final action for OU 5, Site 49. Final RODs have been approved for OU1 through OU 4; OU 5, Site 14; OU 6 through OU 8; OU 9, Sites 36 and 37 and Sites 57 and 58; OU 10 and OU 11; and OU 12, Sites 32, 42, 44, and Old Golf Course. A Remedial Investigation (RI), Baseline Risk Assessment (BRA), and Feasibility Study (FS) have also been prepared for OU 5, Site 15, but the FS is currently being re-evaluated. An RI and FS are being prepared for OU 9, Site 59.

Investigations at OU 5, Site 49 indicated the presence of soil contamination from past operating practices that could pose unacceptable human health and ecological risks if not addressed.

To protect the public from potential current and future health risks, as well as to protect the environment, the following RAOs were established for soil at OU 5, Site 49:

- Prevent unacceptable risk from exposure to soil with concentrations of PAHs and lead in excess of FDEP residential SCTLs.

- Address the potential risk of transfer of organic and inorganic contamination from soil to groundwater from soil with concentrations that exceed FDEP SCTLs for leachability.

Both of these RAOs were achieved by completion of the soil removal actions conducted in 2002, 2003, and 2005.

2.5 SUMMARY OF SITE CHARACTERISTICS

The contaminant sources, detected concentrations, fate and transport, contaminated media, and geologic and hydrogeologic conditions of OU 5, Site 49 are discussed in Section 2.0 of the OU 5, Site 49 EE/CA Report (TtNUS, 2002a). These site characteristics are summarized in the following paragraphs.

2.5.1 Geology and Hydrogeology

Site 49 is located southwest of OU 6, Site 11 and OU 10, Site 21. No site-specific subsurface geologic investigation was performed at the Former Skeet Range. The geological and hydrogeological characteristics of the site are assumed to be similar to those described in the General Information Report (GIR) (ABB-ES, 1996a) and the RI Data Document (ABB-ES, 1996b), respectively, for OU 6, Site 11 and the RI Report for OU 10, Site 21 (TtNUS, 2001b).

2.5.2 Nature and Extent of Contamination

Table 2-1 presents a summary of the soil analytical data for the eight sampling events that occurred between June 1999 and May 2001, and Figure 2-3 shows the sampling locations. Table 2-1 includes minimum and maximum detected concentrations, frequencies of detection, and comparisons of the analytical results to the FDEP SCTLs for direct residential exposure, direct industrial exposure, and leachability to groundwater, and for inorganics to site-specific IBDS values. Table 2-1 indicates that PAHs including 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, benzo(a)anthracene,

benzo(a)pyrene (BaP), benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd) pyrene were detected in soil at Site 49, prior to the soil removal actions, at concentrations in excess of FDEP SCTLs for direct residential exposure and/or leachability to groundwater criteria. In addition, lead, present in approximately 95 percent of the soil samples collected, was detected at concentrations exceeding the FDEP SCTL for direct residential exposure and the IBDS criteria, and arsenic was detected in one of seven samples at a concentration greater than the FDEP SCTL of 2.1 milligrams per kilogram (mg/kg) (HLA, 1998b).

PAHs and lead were detected in soil at concentrations greater than FDEP SCTLs for direct residential exposure and for leachability to groundwater and were retained as soil COCs for Site 49. Arsenic was also detected at one location in soil at a concentration in excess of the default cleanup (IBDS) value, but when averaged with the concentration in a duplicate sample, the exceedance was significantly less than the cleanup value. Pre-excavation exceedances of direct residential exposure or leachability to groundwater SCTLs or site-specific IBDS values for soil are illustrated on Figure 2-4, and post-excavation exceedances are shown on Figure 2-5.

Soil contamination was vertically delineated and then excavated based on statistical analysis and the Three Times Rule. Excavation of samples with concentrations greater than three times the SCTLs resulted in post-excavation concentrations less than leachability criteria, thus ensuring protection of groundwater. One well was installed at Site 49 in an area of elevated PAH concentrations, and groundwater from this well was analyzed for PAHs. Groundwater concentrations were less than detection limits.

2.6 CURRENT AND POTENTIAL FUTURE SITE USES

Site 49 is currently inactive, and the reuse plan indicates that it is in an area that will be assigned for Park/Buffer uses.

2.7 SUMMARY OF SITE RISKS

2.7.1 Human Health Risks

During the Phase II investigation, several carcinogenic PAHs (cPAHs) and lead were detected in soil within Site 49 at concentrations in excess of FDEP SCTLs for direct residential exposure and leachability to groundwater. The site was divided into ½-acre exposure units in order to evaluate the site for residential use, and a statistical evaluation was conducted to determine the areas of soil requiring removal so that the site-wide and residential exposure unit 95-percent UCLs of the remaining concentrations of PAHs and the site-wide and residential exposure unit averages of the remaining

concentrations of lead were equal to or less than their respective SCTLs for direct residential exposure. The results of this statistical evaluation are presented in the Action Memorandum for Operable Unit 5, Site 49 (TtNUS, 2002b).

The BCT decided that soil samples with BaP and lead concentrations greater than three times the FDEP residential SCTLs of 100 µg/kg and 400 mg/kg, respectively, would be excavated. Excavation of these soils ensures protection of human health under a residential scenario. Protection of groundwater is ensured because the leachability SCTLs for these contaminants are greater than three times their respective residential SCTLs. Some soil samples remaining on site after excavation activities were completed may have concentrations in excess of the residential SCTLs, but the post-excavation concentrations over the entire site were determined to be less than residential SCTLs. If the residential exposure unit 95-percent UCLs for PAHs or the residential exposure unit averages for lead are less than residential SCTLs, protection of human health is reasonably ensured.

Because BaP was the principal cPAH detected in the Site 49 soil, the BCT agreed that cPAHs detected in soil at the site should be regarded as a family of compounds and quantified in terms of BaP equivalents (BaPEqs). To ensure protection of human health, the post-excavation exposure concentration of BaPEqs should be less than the residential SCTL for BaP. For a given soil sample, a total BaPEq concentration was derived using detected concentrations of individual cPAHs and toxicity equivalent factors (U.S. EPA, 1993). If a cPAH was not detected in a particular sample, a concentration of one-half of the analytical detection limit for that cPAH was used to compute the total BaPEq concentration of that sample.

During the removal action conducted in August 2002 and November and December 2003, soil was excavated and disposed off site so that the 95-percent UCL of the residual concentrations of BaPEq in soil within the residential exposure units were equal to or less than the direct exposure residential SCTL for BaP. In addition, the mean of the residual concentrations of lead in soil were equal to or less than the direct exposure residential SCTL for lead. Samples with BaPEq concentrations in excess of 300 µg/kg (three times the BaP residential SCTL of 100 µg/kg) and samples with lead concentrations in excess of 1,200 mg/kg (three times the lead residential SCTL of 400 mg/kg) were excavated and disposed in either a permitted solid waste disposal facility or a permitted hazardous waste disposal facility. The excavated soil was replaced with clean fill and naturally friable topsoil from the Marietta Sand Corporation.

To calculate post-excavation exposure BaPEq concentration, BaPEq concentrations of removed samples were replaced with a BaPEq concentration of 50 µg/kg, a value equal to one-half the BaP detection limit in the fill samples. Post-excavation concentrations of BaPEqs were less than the residential SCTL for BaP and less than both the U.S. EPA carcinogenic risk range of 1×10^{-4} to 1×10^{-6} and the FDEP carcinogenic risk value of 1×10^{-6}. The post-excavation exposure concentration for lead was calculated

by the same method, and less than the residential SCTL for lead and less than both the U.S. EPA carcinogenic risk range of 1×10^{-4} to 1×10^{-6} and the FDEP carcinogenic risk value of 1×10^{-6}. Therefore, it was believed that the soil at Site 49 no longer represented an unacceptable human health risk under a residential scenario, as documented in the Source Removal Report submitted on May 10, 2004 (CH2MHill, 2004).

FDEP provided comments on the Source Removal Report in a letter dated June 30, 2004 indicating that they concurred with the removal activities but that they could not concur that the removal activities remediated the site to an extent that would be protective for potential future residential use based on their evaluation of the 95-percent UCL calculation. Based on FDEP's concerns, additional sampling was conducted in July, September, October, and November 2004 and May 2005 to horizontally and vertically delineate PAH contamination in the two areas excavated during the second soil removal action in November 2005. The post-excavation BaPEq concentration was less than the FDEP residential SCTL; therefore, no unacceptable human health risks remain and NFA was approved for Site 49. Final post-excavation concentrations for BaPEqs and lead are presented in Table 2-3.

2.7.2 Ecological Risks

A screening ecological risk assessment was conducted during the EE/CA to evaluate the potential risks to ecological receptors at Site 49. All data evaluated were from samples collected outside the excavated areas. Site 49 consists of a 4-acre grassy field and a 5-acre forested area. Several buildings and structures were located in the northern portion of the grassy field. While in operation as a skeet range, shooters located near the buildings would fire in a southerly direction toward the forested area.

Various terrestrial invertebrates and songbirds utilize the grassy area. Mammals such as various mice, the eastern cottontail, and white-tailed deer forage there. Reptiles such as lizards and a few snakes presumably forage in the grassy area. In addition, a few active burrows of the gopher tortoise are located in the grassy field. The gopher tortoise is classified by the Florida Fish and Wildlife Conservation Commission as a Species of Special Concern.

The forested area immediately to the south of the grassy field consists of planted slash pines and extends to the east, south, and west of Site 49. Vegetation within a 1.5-acre portion of the forest immediately south of the grassy field differs from that of the surrounding forest. Specifically, there is very little undergrowth on the ground surface. In addition, the pines are shorter and thinner than pines in the forest surrounding this 1.5-acre area. Many of the same wildlife species that forage in the grassy field would be expected to forage in the forested area, although the sparse undergrowth presumably decreases the extent of wildlife usage in this area.

The terrain within the grassy area is flat. The adjacent pine forest to the south of the grassy area is approximately 3 feet down slope from the grassy area, and slopes slightly downward from west to east within the forest.

The primary contaminant source at Site 49 is lead shot and clay pigeons from the skeet range. Numerous lead shot pellets are visible on the ground surface in a portion of the forested area south of the grassy field. Contaminant migration pathways applicable at the site include volatilization, erosion, overland runoff and infiltration. Although lead pellets would not volatilize, compounds such as PAHs from clay pigeons could volatilize from surface material or become airborne through wind erosion. The wind erosion pathway, however, is negligible in the grassy field. Surface soil, if disturbed, could serve as a source for airborne transport of contaminants, which could then be transported to downwind locations. Precipitation runoff could carry contaminants to off-site locations. However, the flat topography within the grassy field minimizes this migration pathway. Infiltrating precipitation could cause contamination of subsurface soil and groundwater, but the soil-to-groundwater pathway appears to be absent at Site 49.

Soil data collected outside the remediation areas indicated that PAH compounds and five metals were present in soil samples at concentrations that exceeded U.S. EPA Region 4 ecological screening values (Table 2-2). Screening levels were not available for some PAHs. PAHs do not biomagnify in the food web, and PAHs present at the concentrations measured at Site 49 would not bioaccumulate. Because concentrations of PAHs exceeded conservative screening values in only a few samples, and because the hazard quotients (HQs) were relatively low, ecological risks to soil invertebrates such as earthworms from PAHs are considered to be negligible.

Maximum concentrations of aluminum, antimony, chromium, iron, and lead also exceeded Region 4 ecological screening values. However, maximum concentrations of aluminum, antimony, chromium, and iron were less than their respective site-specific IBDS values, indicating that concentrations of these four metals are not site related.

Lead concentrations are elevated throughout the site. The post-remediation average lead concentration remaining on site is 129.6 mg/kg. This concentration is less than the site-specific IBDS value for lead (197 mg/kg) (HLA, 1998) and indicates that potential risks to upper-level receptors from lead in surface soil are minimal after remediation. Post-excavation average lead concentrations are less than 500 mg/kg guideline for earthworm toxicity. Lead concentrations exceed the 50 mg/kg guideline for plant toxicity in several samples. Some of these samples are within the area where understory vegetation is sparse and trees appear stunted, while other samples are in areas where vegetation is thriving.

2.7.3 Risk Assessment Summary

Final post-excavation exposure concentrations for lead and BaPEqs were less than both the U.S. EPA target risk range and the FDEP target risk and ecological risks were determined to be minimal after remediation. Based on the absence of excess risk to human health and the environment from contaminants in the media investigated, a no action NFA remedy has been selected as the appropriate response action for Site 49. The measured level of risk to human health and environmental receptors allows for unrestricted use and/or unlimited exposure.

2.8 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU 5, Site 49 (TtNUS, 2006) was released for public comment on March 8, 2006. The Proposed Plan identified NFA as the preferred remedy. The public was invited to comment during a 30-day period extending from March 8 to April 7, 2006. No public comments were received during this period, and no changes to the proposed remedy as originally identified in the Proposed Plan have been made. The Navy and U.S. EPA, with the concurrence of FDEP, have determined that no remedial action is required to ensure protection of human health and the environment at Site 49. This response action may be re-evaluated in the future if the parties become aware of new information and/or conditions at Site 49 that indicate that an unacceptable risk to human health or the environment exists.

TABLE 2-1

SUMMARY OF PRE-EXCAVATION SOIL ANALYTICAL DATA
OPERABLE UNIT 5, SITE 49
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Minimum Detection	Maximum Detection	Frequency of Detection	FDEP SCTL[1]			IBDS[2]
				Direct Exposure Residential	Direct Exposure Industrial	Leachability to Groundwater	
Volatile Organic Compounds (µg/kg)							
Acetone	47.2	47.2	1/2	11,000,000	68,000,000	25,000	NC
Methylene Chloride	8.6	11.9	2/5	17,000	26,000	20	NC
Semivolatile Organic Compounds (µg/kg)							
1-Methylnaphthalene	24.2	66,500	5/77	200,000	1,800,000	**3,100**	NC
2-Methylnaphthalene	65.9	79,200	24/77	210,000	2,100,000	**8,500**	NC
Acenaphthene	59.8	78,500	26/77	2,400,000	20,000,000	**2,100**	NC
Acenaphthylene	167	770	3/77	1,800,000	20,000,000	27,000	NC
Anthracene	40.7	36,000	15/77	21,000,000	300,000,000	2,500,000	NC
Benzo(a)anthracene	14.8	93,900	44/77	#	#	**800**	NC
Benzo(a)pyrene	11.6	71,400	53/77	**100**	**700**	**8,000**	NC
Benzo(b)fluoranthene	13.2	53,100	50/77	#	#	**2,400**	NC
Benzo(g,h,i)perylene	19	21,200	44/77	2,500,000	52,000,000	32,000,000	NC
Benzo(k)fluoranthene	16.1	45,400	48/77	#	#	**24,000**	NC
Chrysene	30.4	103,000	44/77	#	#	**77,000**	NC
Dibenzo(a,h)anthracene	24.9	3,300	28/77	#	#	**700**	NC
Fluoranthene	18.8	190,000	48/77	3,200,000	59,000,000	1,200,000	NC
Fluorene	129	4,010	11/77	2,600,000	33,000,000	160,000	NC
Indeno(1,2,3-cd)pyrene	24.95	30,000	38/77	#	#	**6,600**	NC
Naphthalene	56.3	520	5/77	55,000	300,000	1,200	NC
Phenanthrene	60.5	125,000	32/77	2,200,000	36,000,000	250,000	NC

TABLE 2-1

SUMMARY OF PRE-EXCAVATION SOIL ANALYTICAL DATA
OPERABLE UNIT 5, SITE 49
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Minimum Detection	Maximum Detection	Frequency of Detection	FDEP SCTL[1]			IBDS[2]
				Direct Exposure Residential	Direct Exposure Industrial	Leachability to Groundwater	
Semivolatile Organic Compounds (µg/kg) (continued)							
Pyrene	10.1	152,000	48/61	2,400,000	45,000,000	880,000	NC
BaPEqs	0	96,657	75/77	**100**	**700**	NC	NC
Inorganics (mg/kg)							
Aluminum	765	945	2/2	80,000	NC	NC	4,430
Antimony	0.8	5.6	2/2	27	370	5.4	9.44
Arsenic	0.71	2.3	1/7	2.1	12	NC	**2.04**
Barium	2.3	2.5	2/2	120	130,000	1,600	14.4
Chromium	1.3	2	1/2	210	470	38	7.75
Cobalt	0.15	0.23	2/2	1,700	42,000	NC	3.11
Copper	0.89	1.9	2/2	150	89,000	NC	5.97
Iron	166	207	2/2	53,000	NC	NC	1,490
Lead	4.5	66,300	82/87	**400**	**1,400**	NC	**197**
Manganese	2.3	2.8	2/2	3,500	43,000	NC	22
Vanadium	1	1.6	2/2	15	10,000	980	6.3
Zinc	2.8	4.8	2/2	26,000	630,000	NC	37

1 Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) (FDEP, 2005).
2 NAS Cecil Field site-specific Inorganic Background Data Set (HLA, 1998).
NC = No criterion.
Bold indicates exceedance of residential SCTL, leachability SCTL, or IBDS value.
Based on Chapter 62-777, F.A.C., site concentrations of carginogenic polynuclear aromatic hydrocarbons (PAHs) are converted to benzo(a)pyrene equivalents (BaPEqs) before comparison to benzo(a)pyrene (BaP) SCTLs.

TABLE 2-2

ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SOIL - POST-EXCAVATION
OPERABLE UNIT 5, SITE 49
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Frequency of Detection	Range of Detections		Location of Maximum Detection	Range of Detection Limits	Average Value	Ecological Screening Value	Maximum Hazard Quotient	NAS Cecil Field Background Value
		Minimum	Maximum						
Semivolatile Organic Compounds (ug/kg)									
1-Methylnaphthalene	1/49	74.5	107	CEF-P49-SS-812	33.5 - 380	100	NA	NA	NA
2-Methylnaphthalene	2/49	65.85	98.2	CEF-P49-SS-812	33.5 - 380	100.7	NA	NA	NA
Acenaphthene	4/49	59.8	131	CEF-P49-SS-812	33.5 - 750	186.2	20,000	0.007	NA
Anthracene	1/49	1420	1420	CEF-P49-SS-807	33.5 - 750	146.1	NA	NA	NA
Benzo(a)anthracene	18/49	14.8	10900	CEF-P49-SS-812	5 - 245	460.3	NA	NA	NA
Benzo(a)pyrene	27/49	11.6	18500	CEF-P49-SS-812	5 - 49	660.9	100	185	NA
Benzo(b)fluoranthene	24/49	13.2	16200	CEF-P49-SS-812	5 - 49	509.8	NA	NA	NA
Benzo(g,h,i)perylene	21/49	28.9	15000	CEF-P49-SS-812	5 - 49	535.9	NA	NA	NA
Benzo(k)fluoranthene	24/49	16.1	7870	CEF-P49-SS-812	5 - 49	282.9	NA	NA	NA
Chrysene	19/49	30.4	11100	CEF-P49-SS-812	5 - 245	494.1	NA	NA	NA
Dibenzo(a,h)anthracene	11/49	35.6	2240	CEF-P49-SS-812	5 - 49	92.8	NA	NA	NA
Fluoranthene	22/49	18.8	13400	CEF-P49-SS-812	5 - 245	620.5	100	134	NA
Fluorene	1/49	850	850	CEF-P49-SS-807	33.5 - 750	134.5	NA	NA	NA
Indeno(1,2,3-cd)pyrene	16/49	24.95	15000	CEF-P49-SS-812	5 - 49	496.7	NA	NA	NA
Phenanthrene	9/49	60.45	4870	CEF-P49-SS-807	5 - 245	327	100	48.70	NA
Pyrene	22/49	10.1	12200	CEF-P49-SS-812	5 - 245	589.9	100	122	NA
Inorganic Compounds (mg/kg)									
Lead	48/52	7.5	502	CEF-P49-SS-026	0.85 - 3.4	129.6	50	10.04	197

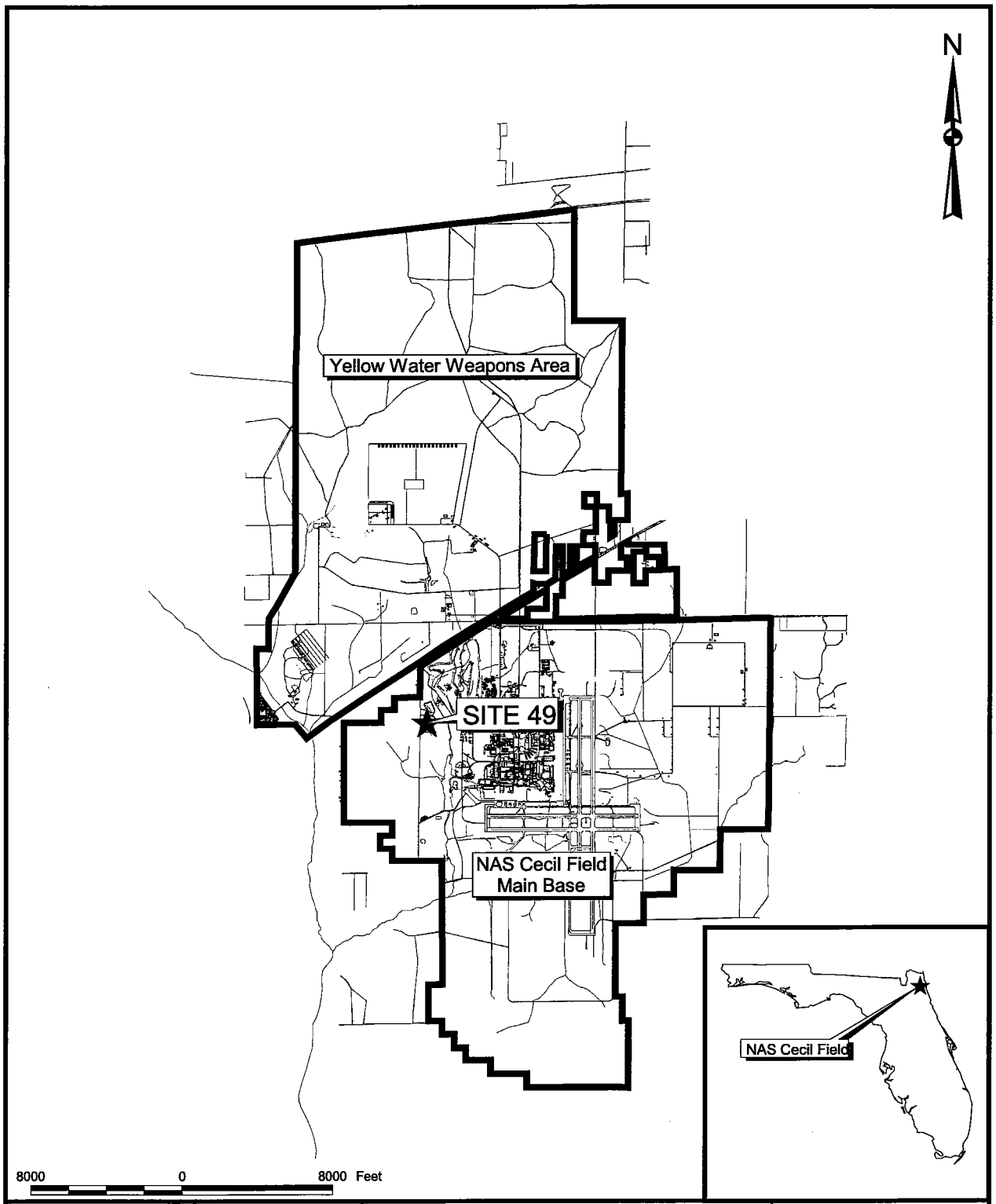
NA = Not available.

TABLE 2-3

SUMMARY OF POST-EXCAVATION SOIL ANALYTICAL DATA
OPERABLE UNIT 5, SITE 49
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

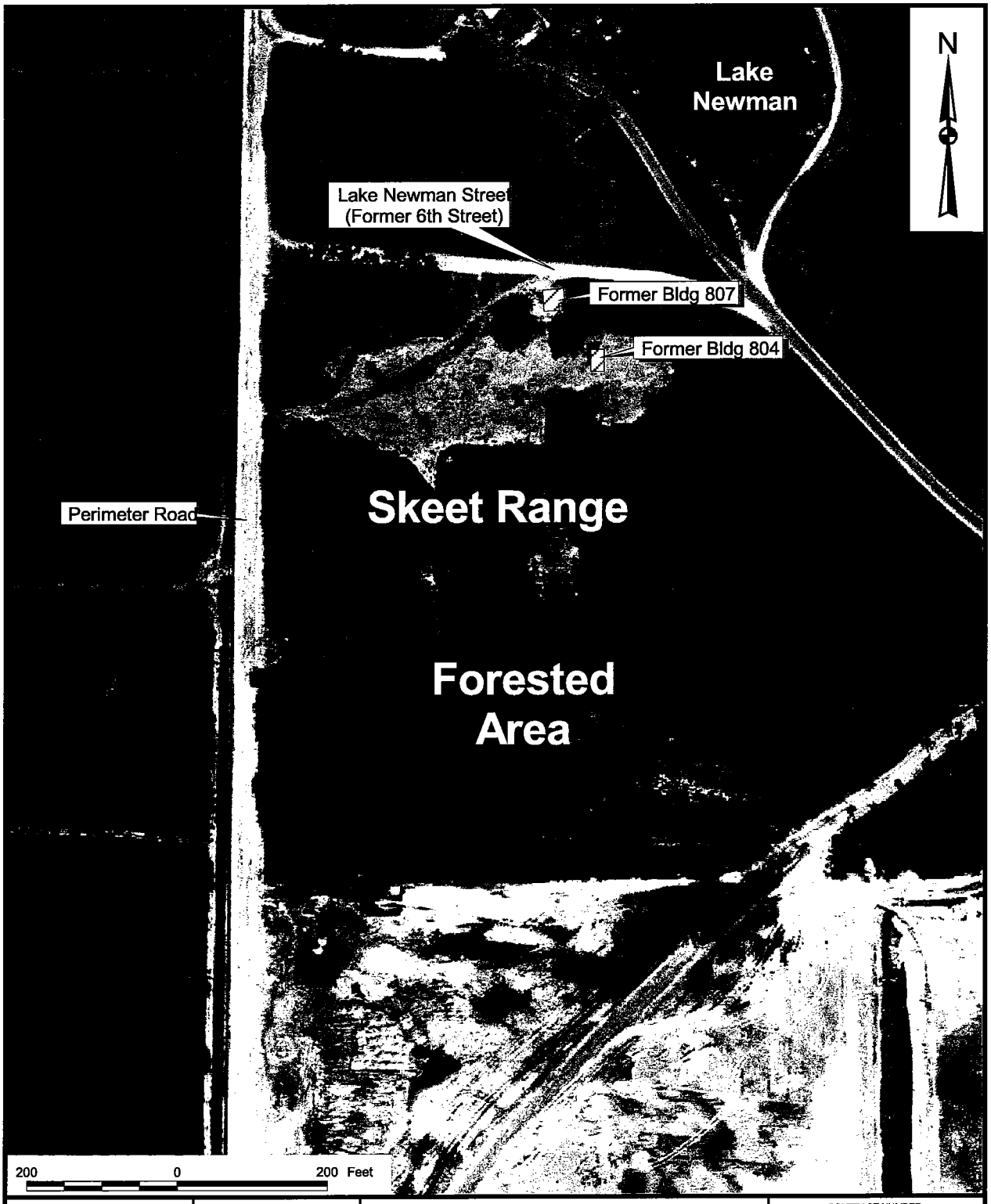
Cell	Minimum Detected Concentration	Maximum Detected Concentration	FDEP Residential SCTL
BaPEqs (µg/kg)			
6	--	--	100
7	4.2	4.2	100
13	5.5	13.5	100
14	5	37	100
15	10.5	36	100
16	36	85.6	100
17	46	66	100
18	34	40	100
19	9	123	100
20	36	99	100
Lead (mg/kg)			
1	--	--	400
2	50	189	400
3	14.1	227	400
4	28	130	400
5	--	--	400
6	17.1	232	400
7	13.9	98.9	400
8	266	266	400
9	7.5	387	400
10	16	165	400
11	22.2	363	400
12	128	365	400
13	7.5	160.5	400
14	--	--	400
15	9.1	28.5	400
16	131	445[(1)]	400
17	46	66	400

Florida Department of Environmental Protection Soil Cleanup Target Levels (FDEP, 2005).
Cells included are those in which the parameter was analyzed.
-- Not detected or all samples for the parameter were excavated from the cell.
1 The average lead concentration in Cell 16 is 154 mg/kg.



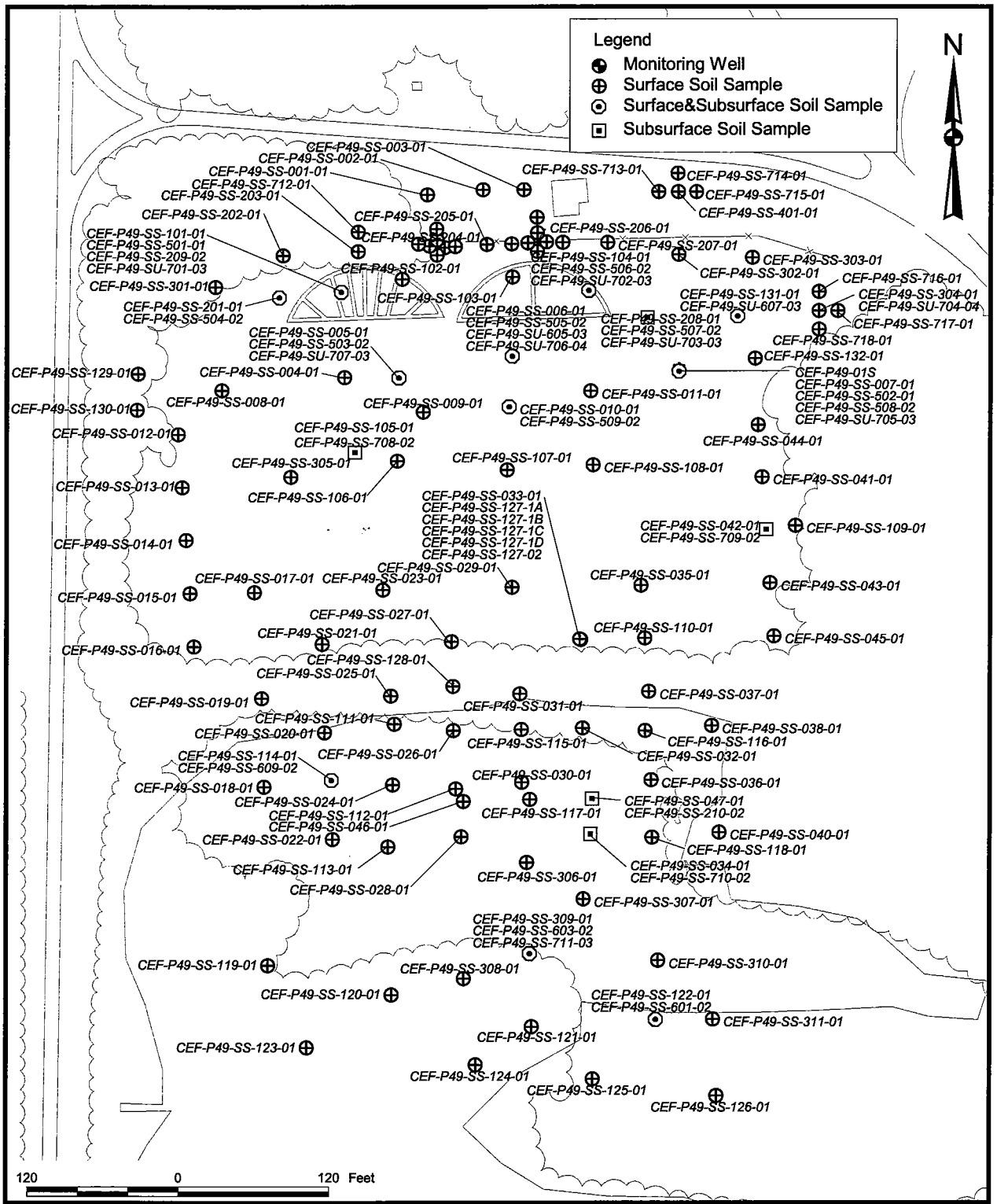
DRAWN BY MJJ	DATE 26Jun01	GENERAL LOCATION MAP OU 5 - SITE 49, FORMER SKEET RANGE RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY	DATE 10/10/06		APPROVED BY	DATE 9/14/06
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 2-1	REV 1

P:\GIS\NAS_CecilField\Site-49_ROD.apr 16Feb05 MJJ Layout01



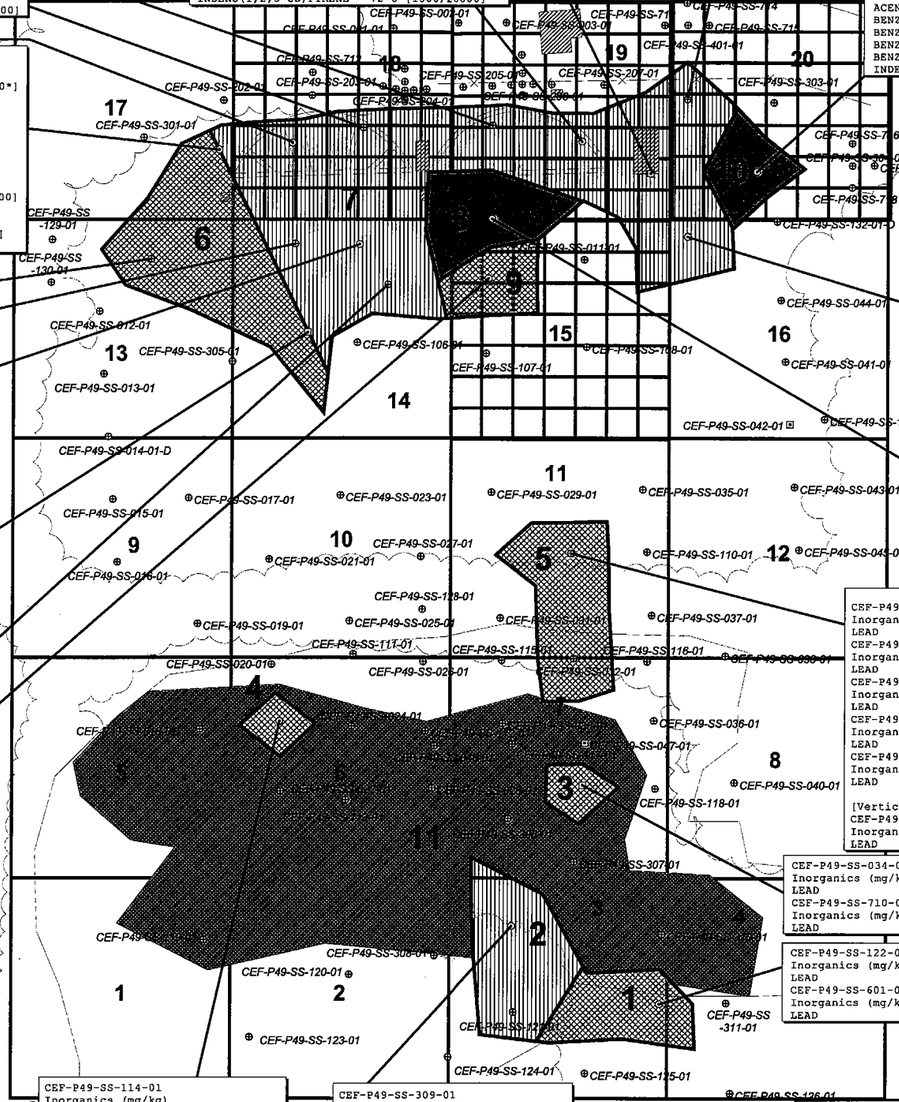
DRAWN BY MJJ	DATE 26Jun01	SITE LAYOUT MAP OU 5 - SITE 49, FORMER SKEET RANGE RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY	DATE 10/10/06		APPROVED BY GDS DATE 9/14/06
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 2-2 REV 1

P:\GIS\NAS_CecilField\Site-49_ROD.apr 16Feb05 MJJ Layout02



DRAWN BY MJJ	DATE 07Jun04	SAMPLE LOCATION MAP OU 5 - SITE 49, FORMER SKEET RANGE RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY	DATE 10/10/06		APPROVED BY DATE 9/11/06
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 2-3 REV 1

P:\GIS\NAS_CecilField\Site-49_ROD.apr 16Feb05 MJJ Layout03



CEF-P49-SS-101-01
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	19700 J	[83000*/6100*]
ACENAPHTHENE	23200 J	[1900000*/2100*]
BENZO(A)ANTHRACENE	27800 J	[1400*/3200*]
BENZO(A)PYRENE	65600 J	[100*/8000*]
BENZO(B)FLUORANTHENE	39200 J	[1400*/10000*]
DIBENZO(A,H)ANTHRACENE	10900 J	[100*/30000]
INDENO(1,2,3-CD)PYRENE	25600 J	[1500*/28000]

CEF-P49-SS-501-01
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	150	[83000/6100]
ACENAPHTHENE	455	[1900000/2100]
BENZO(A)ANTHRACENE	1200	[1400/3200]
BENZO(A)PYRENE	2050	[100*/8000]
BENZO(B)FLUORANTHENE	2430	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	936	[100*/30000]
INDENO(1,2,3-CD)PYRENE	1720	[1500*/28000]

CEF-P49-SS-209-02
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	901	[83000/6100]
ACENAPHTHENE	1250	[1900000/2100]
BENZO(A)ANTHRACENE	1160	[1400/3200]
BENZO(A)PYRENE	176	[100*/8000]
BENZO(B)FLUORANTHENE	1700	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	938	[100*/30000]
INDENO(1,2,3-CD)PYRENE	9.9 U	[1500/28000]

[Vertical Delineation Sample]
CEF-P49-SU-701-03
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	390 U/410 U	[83000*/6100*]
ACENAPHTHENE	780 U/820 U	[1900000/2100]
BENZO(A)ANTHRACENE	390 U/410 U	[1400/3200]
BENZO(A)PYRENE	78 U/82 U	[100/8000]
BENZO(B)FLUORANTHENE	78 U/82 U	[1400/10000]
DIBENZO(A,H)ANTHRACENE	78 U/82 U	[100/30000]
INDENO(1,2,3-CD)PYRENE	78 U/82 U	[1500/28000]

CEF-P49-SS-008-01
Semivolatiles (ug/kg)

BENZO(A)PYRENE	170 J/3200 J	[100*/8000]
BENZO(B)FLUORANTHENE	110 J/1600 J	[1400/10000]
BENZO(G,H,I)PERYLENE	80 J/1800 J	[2300000/32000000]
BENZO(K)FLUORANTHENE	8.2 UJ/3200 J	[15000/25000]
DIBENZO(A,H)ANTHRACENE	14 UJ/1600 J	[100/30000]

CEF-P49-SS-004-01
Semivolatiles (ug/kg)

BENZO(A)PYRENE	720	[100*/8000]
DIBENZO(A,H)ANTHRACENE	110	[100*/30000]

CEF-P49-SS-005-01
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	1100 U	[68000/2200]
2-METHYLNAPHTHALENE	3500	[83000/6100]
ACENAPHTHENE	4400	[1900000*/2100*]
BENZO(A)ANTHRACENE	1700	[1400*/3200]
BENZO(A)PYRENE	3200	[100*/8000]
BENZO(B)FLUORANTHENE	2800	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	270 U	[100/30000]

CEF-P49-SS-503-02
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	69 U	[68000/2200]
2-METHYLNAPHTHALENE	275	[83000/6100]
ACENAPHTHENE	208	[1900000/2100]
BENZO(A)ANTHRACENE	457	[1400/3200]
BENZO(A)PYRENE	802	[100*/8000]
BENZO(B)FLUORANTHENE	848	[1400/10000]
DIBENZO(A,H)ANTHRACENE	322	[100*/30000]

[Vertical Delineation Sample]
CEF-P49-SU-707-03
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	360 U	[68000/2200]
2-METHYLNAPHTHALENE	360 U	[83000/6100]
ACENAPHTHENE	710 U	[1900000/2100]
BENZO(A)ANTHRACENE	360 U	[1400/3200]
BENZO(A)PYRENE	71 U	[100/8000]
BENZO(B)FLUORANTHENE	71 U	[1400/10000]
DIBENZO(A,H)ANTHRACENE	71 U	[100/30000]

CEF-P49-SS-103-01
Semivolatiles (ug/kg)

BENZO(A)ANTHRACENE	1530	[1400*/3200]
BENZO(A)PYRENE	3110	[100*/8000]
BENZO(B)FLUORANTHENE	3060	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	501	[100*/30000]
INDENO(1,2,3-CD)PYRENE	2070	[1500*/28000]

CEF-P49-SS-102-01
Semivolatiles (ug/kg)

BENZO(A)PYRENE	323	[100*/8000]

CEF-P49-SS-201-01
Semivolatiles (ug/kg)

ACENAPHTHENE	5710	[1900000*/2100*]
BENZO(A)ANTHRACENE	3550	[1400*/3200*]
BENZO(A)PYRENE	4460	[100*/8000]
BENZO(B)FLUORANTHENE	6880	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	1300	[100*/30000]

[Vertical Delineation Sample]
CEF-P49-SS-504-02
Semivolatiles (ug/kg)

ACENAPHTHENE	72 U	[1900000/2100]
BENZO(A)ANTHRACENE	23.8	[1400/3200]
BENZO(A)PYRENE	15.2	[100/8000]
BENZO(B)FLUORANTHENE	34.6	[1400/10000]
DIBENZO(A,H)ANTHRACENE	11 U	[100/30000]

CEF-P49-SS-105-01
Semivolatiles (ug/kg)

BENZO(A)PYRENE	2770	[100*/8000]
BENZO(B)FLUORANTHENE	1440	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	246	[100*/30000]

[Vertical Delineation Sample]
CEF-P49-SS-708-02
Semivolatiles (ug/kg)

BENZO(A)PYRENE	74 U	[100/8000]
BENZO(B)FLUORANTHENE	74 U	[1400/10000]
DIBENZO(A,H)ANTHRACENE	74 U	[100/30000]

CEF-P49-SS-009-01

BENZO(A)PYRENE	950	[100*/8000]

CEF-P49-SS-010-01
Semivolatiles (ug/kg)

ACENAPHTHENE	4300	[1900000*/2100*]
BENZO(A)ANTHRACENE	2200	[1400*/3200]
BENZO(A)PYRENE	4200	[100*/8000]
BENZO(B)FLUORANTHENE	2600	[1400*/10000]
INDENO(1,2,3-CD)PYRENE	1600	[1500*/28000]

[Vertical Delineation Sample]
CEF-P49-SS-509-02
Semivolatiles (ug/kg)

ACENAPHTHENE	70 U	[1900000/2100]
BENZO(A)ANTHRACENE	10 U	[1400/3200]
BENZO(A)PYRENE	19	[100/8000]
BENZO(B)FLUORANTHENE	10 U	[1400/10000]
INDENO(1,2,3-CD)PYRENE	108	[1500/28000]

EXCAVATION	AREA ft2	DEPTH ft bgs	VOLUME yd3
1	4120	1	152
2	6261	2	464
3	1273	1	47
4	1082	1	40
5	6433	1	238
6	11026	1	408
7	32937	2	2440
8	4682	3	520
9	2729	1	101
10	2678	3	298
11	59457	0.5	1101
		Total Yards	5809

Legend
- Monitoring Well
- Surface Soil Sample
- Surface and Subsurface Soil Sample
- Subsurface Soil Sample
- Demolished Buildings
- Excavated to 1' Below Ground Surface (bgs) [Human Health]
- Excavated to 0.5' Below Ground Surface [Ecological Concerns]
- Excavated to 2' Below Ground Surface [Human Health]
- Excavated to 3' Below Ground Surface [Human Health]

CEF-P21-SS-001 — Sample ID
Fraction (ug/kg) — FDEP Residential SCTL / FDEP Leachability SCTL
PARAMETER 500 [100/200]* — Detected Concentration / Parameter

J - Estimated concentration
U - Not detected at or above method detection limit (associated value)
* - Concentration exceeds target cleanup goal

CEF-P49-SS-104-01
Semivolatiles (ug/kg)

ACENAPHTHENE	3860	[1900000*/2100*]
BENZO(A)ANTHRACENE	4750	[1400*/3200*]
BENZO(A)PYRENE	10400	[100*/8000*]
BENZO(B)FLUORANTHENE	6170	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	1010	[100*/30000]
INDENO(1,2,3-CD)PYRENE	4740	[1500*/28000]

CEF-P49-SS-506-02
Semivolatiles (ug/kg)

ACENAPHTHENE	271	[1900000/2100]
BENZO(A)ANTHRACENE	519	[1400/3200]
BENZO(A)PYRENE	530	[100*/8000]
BENZO(B)FLUORANTHENE	681	[1400/10000]
DIBENZO(A,H)ANTHRACENE	11 U	[100/30000]
INDENO(1,2,3-CD)PYRENE	404	[1500/28000]

[Vertical Delineation Sample]
CEF-P49-SU-702-03
Semivolatiles (ug/kg)

ACENAPHTHENE	720 U	[1900000/2100]
BENZO(A)ANTHRACENE	360 U	[1400/3200]
BENZO(A)PYRENE	72 U	[100/8000]
BENZO(B)FLUORANTHENE	72 U	[1400/10000]
DIBENZO(A,H)ANTHRACENE	72 U	[100/30000]
INDENO(1,2,3-CD)PYRENE	72 U	[1500/28000]

CEF-P49-SS-208-01
Semivolatiles (ug/kg)

ACENAPHTHENE	6670	[1900000*/2100*]
BENZO(A)ANTHRACENE	5700	[1400*/3200*]
BENZO(A)PYRENE	9760	[100*/8000*]
BENZO(B)FLUORANTHENE	6720	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	3300	[100*/30000]

CEF-P49-SS-507-02 [Vertical Delineation Sample]
Semivolatiles (ug/kg)

ACENAPHTHENE	488	[1900000/2100]
BENZO(A)ANTHRACENE	820	[1400/3200]
BENZO(A)PYRENE	1670	[100*/8000]
BENZO(B)FLUORANTHENE	1460	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	761	[100*/30000]

CEF-P49-SS-302-01
Semivolatiles (ug/kg)

ACENAPHTHENE	386	[1900000/2100]
BENZO(A)ANTHRACENE	327	[1400/3200]
BENZO(A)PYRENE	820	[100*/8000]
BENZO(B)FLUORANTHENE	558	[1400/10000]
DIBENZO(A,H)ANTHRACENE	149	[100*/30000]

CEF-P49-SS-131-01
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	140 U	[68000/2200]
2-METHYLNAPHTHALENE	600	[83000/6100]
ACENAPHTHENE	581	[1900000/2100]
BENZO(A)ANTHRACENE	854	[1400/3200]
BENZO(A)PYRENE	1910	[100*/8000]
BENZO(B)FLUORANTHENE	1170	[1400/10000]
BENZO(K)FLUORANTHENE	13000	[15000/25000]
INDENO(1,2,3-CD)PYRENE	10000 UJ	[1500/28000]

CEF-P49-SU-607-03
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	52000 U/22900 J	[68000/2200]
2-METHYLNAPHTHALENE	52000 UJ/28100 J	[83000/6100]
ACENAPHTHENE	52000 U/27700 J	[1900000/2100]
BENZO(A)ANTHRACENE	24700/40000	[1400*/3200*]
BENZO(A)PYRENE	14200 J/33500 J	[100*/8000*]
BENZO(B)FLUORANTHENE	8490 J/21600 J	[1400*/10000]
BENZO(K)FLUORANTHENE	13000/17300	[15000/25000]
INDENO(1,2,3-CD)PYRENE	10000 UJ/13400 J	[1500/28000]

[Vertical Delineation Sample]
CEF-P49-SU-704-04
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	490 U	[68000/2200]
2-METHYLPHENOL	490 U	[2400000/300]
ACENAPHTHENE	980 U	[1900000/2100]
BENZO(A)ANTHRACENE	490 U	[1400/3200]
BENZO(A)PYRENE	98 U	[100/8000]
BENZO(B)FLUORANTHENE	98 U	[1400/10000]
BENZO(K)FLUORANTHENE	98 U	[15000/25000]
INDENO(1,2,3-CD)PYRENE	98 U	[1500/28000]

CEF-P49-SS-007-01
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	17000	[83000*/6100*]
ACENAPHTHENE	29000	[1900000*/2100*]
BENZO(A)ANTHRACENE	14000	[1400*/3200*]
BENZO(A)PYRENE	20000	[100*/8000*]
BENZO(B)FLUORANTHENE	190000	[1400*/10000*]
DIBENZO(A,H)ANTHRACENE	7400	[100*/30000]
INDENO(1,2,3-CD)PYRENE	14000	[1500*/28000]

CEF-P49-SS-502-01
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	321 J/70 UJ	[83000/6100]
ACENAPHTHENE	279 J/70 UJ	[1900000/2100]
BENZO(A)ANTHRACENE	578 J/141 J	[1400/3200]
BENZO(A)PYRENE	1560 J/150 J	[100*/8000]
BENZO(B)FLUORANTHENE	938 J/240 J	[1400/10000]
DIBENZO(A,H)ANTHRACENE	345 J/87.8 J	[100*/30000]
INDENO(1,2,3-CD)PYRENE	760 J/227 J	[1500/28000]

CEF-P49-SS-508-02
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	76 U	[83000/6100]
ACENAPHTHENE	76 U	[1900000/2100]
BENZO(A)ANTHRACENE	132	[1400/3200]
BENZO(A)PYRENE	260	[100*/8000]
BENZO(B)FLUORANTHENE	230	[1400/10000]
DIBENZO(A,H)ANTHRACENE	39.5	[100/30000]
INDENO(1,2,3-CD)PYRENE	203	[1500/28000]

[Vertical Delineation Sample]
CEF-P49-SU-705-03
Semivolatiles (ug/kg)

2-METHYLPHENOL	360 U	[2400000/300]
ACENAPHTHENE	720 U	[1900000/2100]
BENZO(A)ANTHRACENE	360 U	[1400/3200]
BENZO(A)PYRENE	72 U	[100/8000]
BENZO(B)FLUORANTHENE	72 U	[1400/10000]
DIBENZO(A,H)ANTHRACENE	72 U	[100/30000]
INDENO(1,2,3-CD)PYRENE	72 U	[1500/28000]

CEF-P49-SS-006-01
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	7400	[83000*/6100*]
ACENAPHTHENE	10000	[1900000*/2100*]
BENZO(A)ANTHRACENE	4800	[1400*/3200*]
BENZO(A)PYRENE	7400	[100*/8000]
BENZO(B)FLUORANTHENE	6100	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	450	[100*/30000]
INDENO(1,2,3-CD)PYRENE	4500	[1500*/28000]

CEF-P49-SS-505-02
Semivolatiles (ug/kg)

2-METHYLNAPHTHALENE	322	[83000/6100]
ACENAPHTHENE	262	[1900000/2100]
BENZO(A)ANTHRACENE	748	[1400/3200]
BENZO(A)PYRENE	1480	[100*/8000]
BENZO(B)FLUORANTHENE	1770	[1400*/10000]
DIBENZO(A,H)ANTHRACENE	1690	[100*/30000]
INDENO(1,2,3-CD)PYRENE	1640	[1500*/28000]

CEF-P49-SU-605-03
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	66500 J	[68000*/2200*]
2-METHYLNAPHTHALENE	79200	[83000*/6100*]
ACENAPHTHENE	78500	[1900000*/2100*]
BENZO(A)ANTHRACENE	93900	[1400*/3200*]
BENZO(A)PYRENE	71400	[100*/8000*]
BENZO(B)FLUORANTHENE	53100	[1400*/10000*]
BENZO(K)FLUORANTHENE	45400	[15000*/25000*]
CHRYSENE	103000	[140000*/77000*]
DIBENZO(A,H)ANTHRACENE	14000 U	[100/30000]
INDENO(1,2,3-CD)PYRENE	30000	[1500*/28000*]

[Vertical Delineation Sample]
CEF-P49-SU-706-04
Semivolatiles (ug/kg)

1-METHYLNAPHTHALENE	400 U	[68000*/2200*]
2-METHYLNAPHTHALENE	400 U	[2400000/300]
ACENAPHTHENE	800 U	[1900000/2100]
BENZO(A)ANTHRACENE	400 U	[1400/3200]
BENZO(A)PYRENE	53.3 J	[100/8000]
BENZO(B)FLUORANTHENE	80 U	[1400/10000]
BENZO(K)FLUORANTHENE	80 U	[15000*/25000*]
CHRYSENE	400 U	[140000*/77000*]
DIBENZO(A,H)ANTHRACENE	80 U	[100/30000]
INDENO(1,2,3-CD)PYRENE	47.1 J	[1500/28000]

CEF-P49-SS-033-01
Inorganics (mg/kg)

LEAD	4130	[400*/NA]

CEF-P49-SS-127-1A
Inorganics (mg/kg)

LEAD	220/315	[400*/NA]

CEF-P49-SS-127-1B
Inorganics (mg/kg)

LEAD	35600	[400*/NA]

CEF-P49-SS-127-1C
Inorganics (mg/kg)

LEAD	23.4	[400/NA]

CEF-P49-SS-127-1D
Inorganics (mg/kg)

LEAD	27.9	[400/NA]

[Vertical Delineation Sample]
CEF-P49-SS-127-02
Inorganics (mg/kg)

LEAD	22.2	[400/NA]

CEF-P49-SS-034-01
Inorganics (mg/kg)

LEAD	1680 J	[400*/NA]

CEF-P49-SS-710-02 [Vertical Delineation Sample]
Inorganics (mg/kg)

LEAD	13.9	[400/NA]

CEF-P49-SS-122-01
Inorganics (mg/kg)

LEAD	33400	[400*/NA]

CEF-P49-SS-601-02 [Vertical Delineation Sample]
Inorganics (mg/kg)

LEAD	16.7	[400/NA]

CEF-P49-SS-114-01
Inorganics (mg/kg)

LEAD	42500	[400*/NA]

[Vertical Delineation Sample]
CEF-P49-SS-609-02
Inorganics (mg/kg)

LEAD	232	[400*/NA]

CEF-P49-SS-309-01
Inorganics (mg/kg)

LEAD	51000	[400*/NA]

CEF-P49-SS-603-02
Inorganics (mg/kg)

LEAD	66300	[400*/NA]

CEF-P49-SU-711-03
Inorganics (mg/kg)

LEAD	11	[400/NA]

50 0 50 Feet

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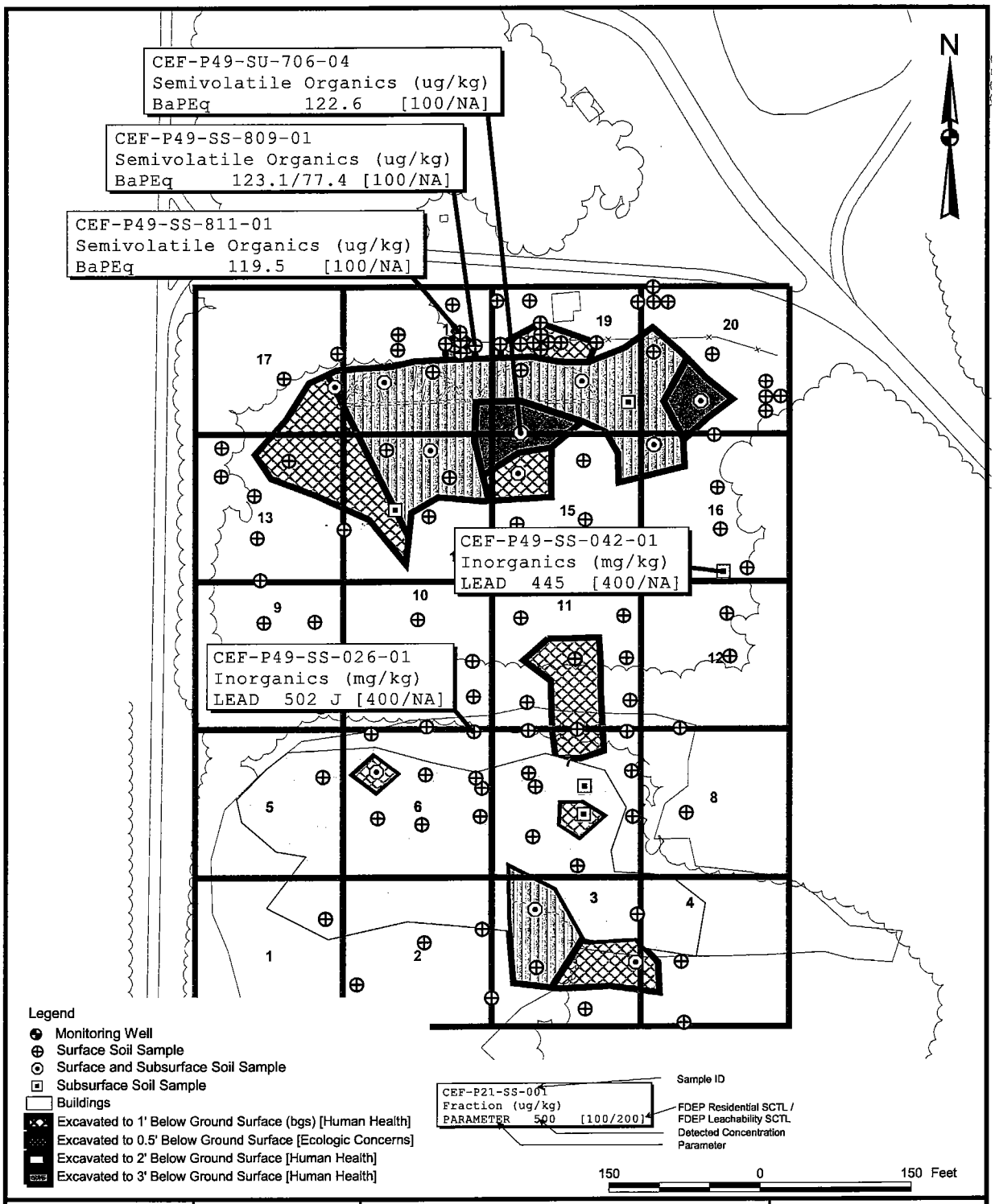
DRAWN BY	MJJ	DATE 27Jun01
CHECKED BY	RRM	DATE 25Apr06
CHECKED BY		DATE
SCALE	AS NOTED	

NAVFAC

SAMPLES EXCEEDING RESIDENTIAL CRITERIA
PRE-SOIL EXCAVATION
OU 5 - SITE 49, FORMER SKEET RANGE
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. 4187
OWNER NO.
APPROVED BY
DATE
DRAWING NO. FIGURE 2-4
REV. 1



DRAWN BY MJJ DATE 26Jun04	NAVFAC	SAMPLES EXCEEDING RESIDENTIAL CRITERIA POST-SOIL EXCAVATION OU 5 - SITE 49, FORMER SKEET RANGE RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY DATE 10/10/06			APPROVED BY DATE 9/14/06
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-5 REV 1

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APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Public notice of the availability of the Proposed Plan was placed in the *Florida-Times Union* on March 7, 2006. A 30-day public comment period was held from March 8 to April 7, 2006. Provisions for the public to request a public meeting to discuss the Proposed Plan were also described in the public notice. No comments were received during the 30-day comment period.