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NAS WHITING FIELD  
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FINAL RECORD OF DECISION FOR SITE 16 NAS WHITING FIELD FL  
9/23/2008  
TETRA TECH NUS

# Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055



Rev. 2  
09/23/08

## Record of Decision for Operable Unit 15 – Site 16, Open Disposal and Burning Area Surface and Subsurface Soil

Naval Air Station Whiting Field  
Milton, Florida

Contract Task Order 0369

September 2008



NAS Jacksonville  
Jacksonville, Florida 32212-0030

**RECORD OF DECISION  
FOR  
OPERABLE UNIT 15 - SITE 16, OPEN DISPOSAL AND BURNING AREA  
SURFACE AND SUBSURFACE SOIL**

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
USEPA ID No. FL2170023244**

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:  
Naval Facilities Engineering Command  
Southeast  
Naval Air Station Jacksonville  
Jacksonville, Florida 32212**

**Submitted by:  
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**CONTRACT NO. N62467-94-D-0888  
CONTRACT TASK ORDER 0369**

**SEPTEMBER 2008**

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### CERTIFICATION OF TECHNICAL DATA CONFORMITY

Tetra Tech NUS, Inc., hereby certifies, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-94-D-0888 are complete, accurate, and comply with all requirements of this contract. 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.

DATE: 23 September 2008

NAME AND TITLE OF CERTIFYING OFFICIAL: Michael O. Jaynes, P.E.  
Task Technical Lead

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## ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
bls	Below land surface
BMP	Base Master Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CG	Cleanup Goals
COC	Constituent of concern
COPC	Constituent of Potential Concern
cPAHs	carcinogenic poly aromatic hydrocarbons
DERP	Defense Environmental Restoration Program
ERA	Ecological risk assessment
EC	Engineering Control
EE	Envirodyne Engineers, Inc.
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FFA	Federal Facility Agreement
FS	Feasibility Study
FSA	Feasibility Study Addendum
G&M	Geraghty & Miller, Inc.
GIS	Geographical information system
HHRA	Human health risk assessment
HI	Hazard Index
HLA	Harding Lawson Associates
HQ	Hazard quotient
IAS	Initial Assessment Study
IC	Institutional Control
ID	Identification
IEUBK	Integrated exposure update biokinetic
ILCR	Incremental Lifetime Cancer Risk
IR	Installation Restoration
IRA	Interim Remedial Action
LUCs	Land Use Controls
mg/kg	milligrams per kilograms
NACIP	Navy Assessment and Control of Installation Pollutants
NAS	Naval Air Station
Navy	United States Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No further action
NPL	National Priorities List
NPW	Net present worth
O&M	Operation and Management
OU	Operable Unit
PAH	polynuclear aromatic hydrocarbon

## ACRONYMS (Continued)

PCB	Polychlorinated Biphenyl
PRG	Preliminary Remediation Goal
RAO	Remedial Action Objective
RBC	Risk-based concentration
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TBC	To Be Considered
TCL	Target Compound List
TRPH	Total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech, NUS, Inc.
µg/dL	micrograms per deciliter
µg/kg	micrograms per kilogram
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound

## **1.0 DECLARATION OF THE RECORD OF DECISION**

### **1.1 SITE NAME AND LOCATION**

Naval Air Station (NAS) Whiting Field (United States Environmental Protection Agency [USEPA] Identification (ID) Number FL2170023244) is located approximately 5.5 miles north of the City of Milton, Florida, in Santa Rosa County, about 25 miles northeast of Pensacola. Operable Unit (OU) 15 - Site 16, Open Disposal and Burning Area, is located near the southwestern facility boundary near Clear Creek at NAS Whiting Field. The approximate location of Site 16 is presented on Figure 1-1.

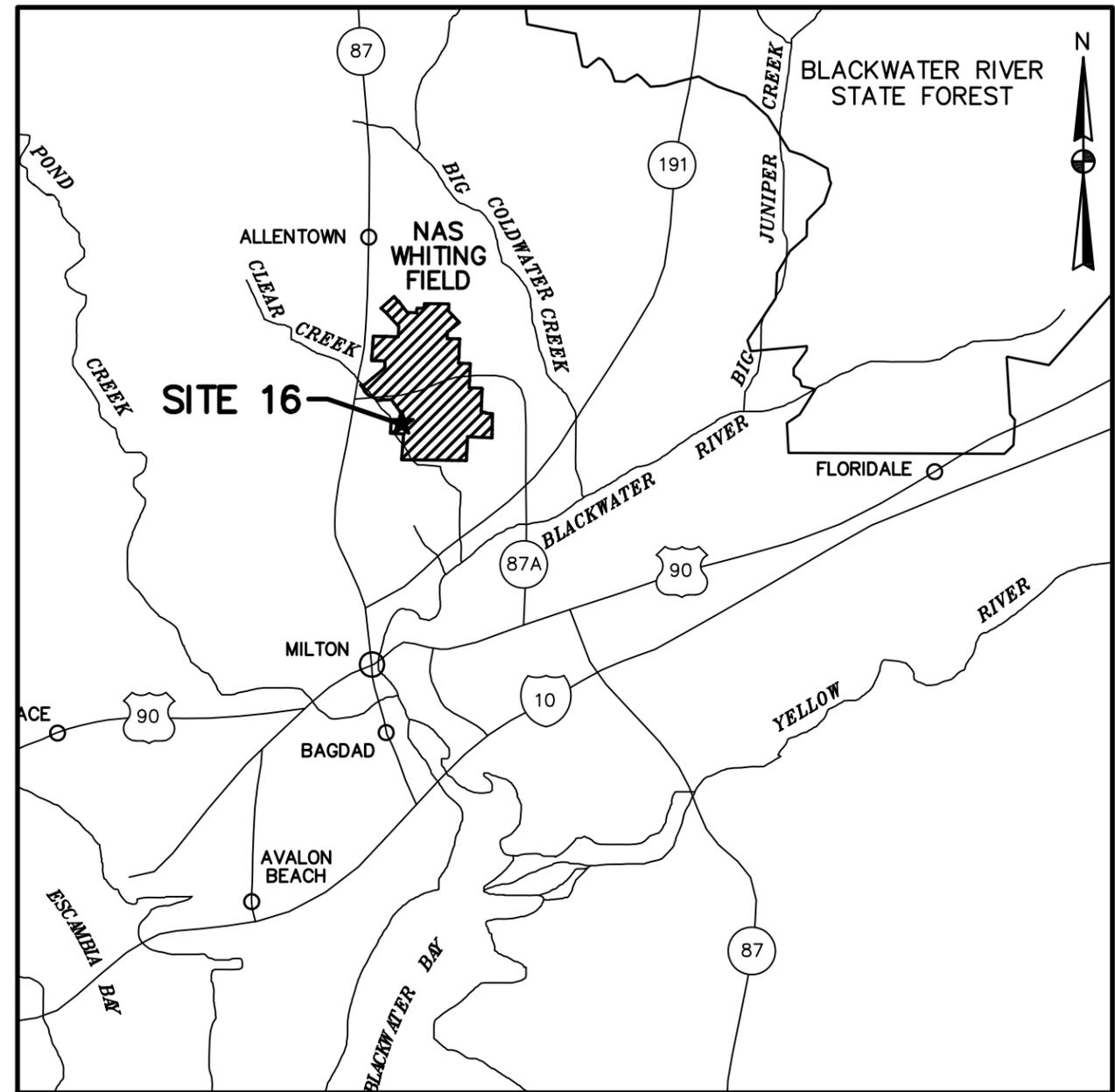
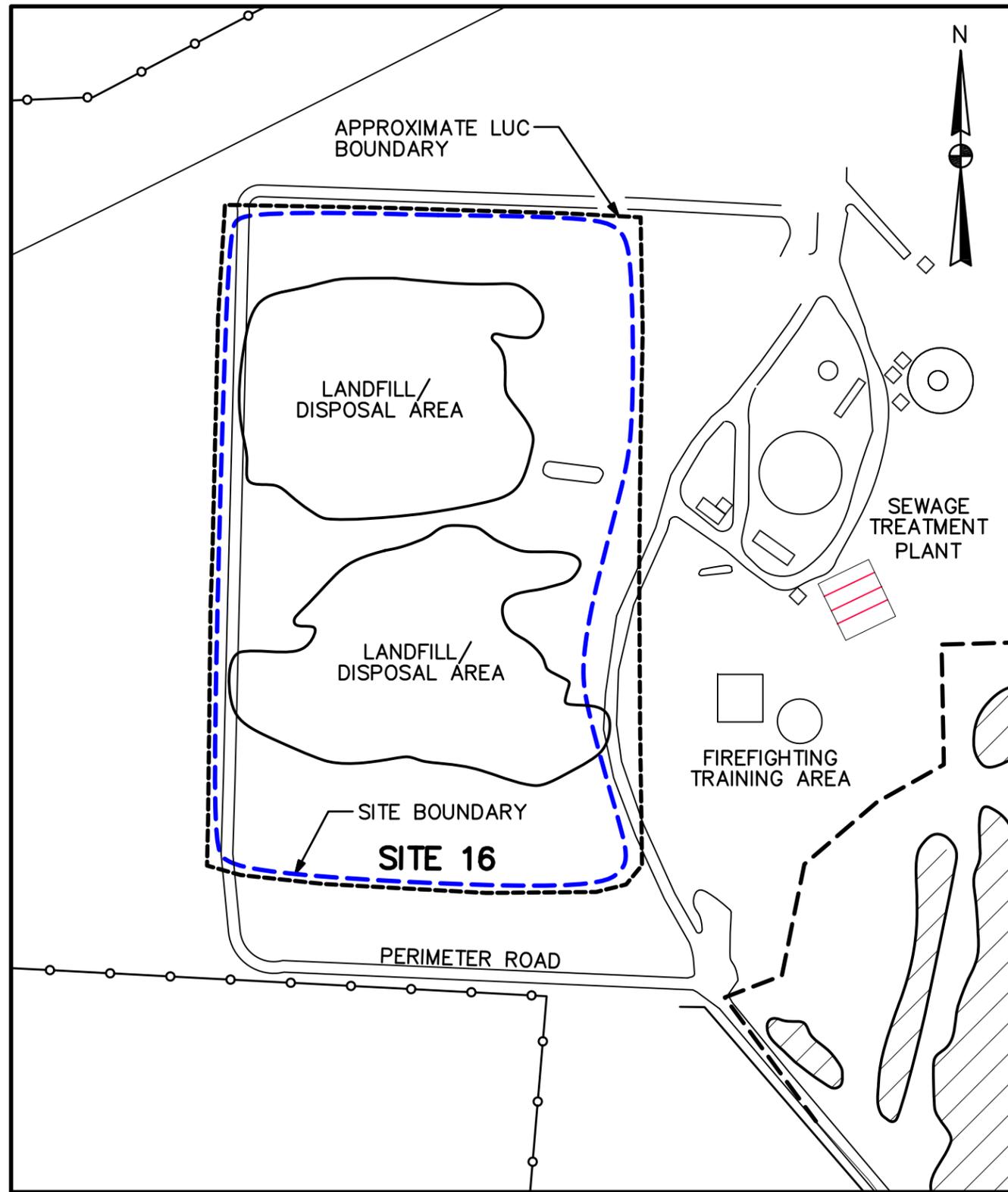
### **1.2 STATEMENT OF BASIS AND PURPOSE**

This decision document presents the selected remedy as Land Use Controls (LUCs) for surface and subsurface soil at OU 15 - Site 16 (USEPA ID No. FL2170023244). Groundwater at NAS Whiting Field has been identified as a separate site (Site 40, Basewide Groundwater) and will be addressed in a future decision document. No surface water exists at Site 16. The remedial action was chosen by the United States Navy (Navy) and USEPA, with concurrence from Florida Department of Environmental Protection (FDEP). The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 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). Information supporting this action is contained in the Administrative Record file for this site. The NAS Whiting Field Information Repository, including the Administrative Record, is located at the West Florida Regional Library, Milton Branch, 805 Alabama Street, Milton, Florida, 32570, (850) 623-5565.

### **1.3 ASSESSMENT OF THE SITE**

The Remedial Investigation (RI) Report for Site 16 (HLA, 2000) identified two volatile organic compounds (VOCs), 14 semivolatile organic compounds (SVOCs), six pesticides, two polychlorinated biphenyls (PCBs), 23 inorganic constituents, and cyanide in surface soil and seven VOCs, 11 SVOCs, four pesticides, and 20 inorganic constituents in subsurface soil. Four constituents, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), barium, copper, and lead were identified as constituents of concern (COCs) in surface soil, and three constituents, barium, copper, and lead, were identified as COCs in subsurface soil. The COCs were determined under a residential land use scenario based on the revised human health risk assessment (HHRA) included in the *Risk Assessment Re-evaluation of Soils*,

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**FIGURE 1-1**  
**SITE 16 LOCATION AND AREA MAP**  
**RECORD OF DECISION**  
**NAS WHITING FIELD, MILTON, FLORIDA**



*Sites 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 Report* (TtNUS, 2006). The revised HHRA was necessary to evaluate the impact of the revised conditions for surface and subsurface soil at Site 16 at NAS Whiting Field.

The regulatory revisions and supplemental investigative findings impacting Site 16 include:

- Arsenic, originally identified as a COC at Site 16, was determined to be naturally occurring at the site. Based on additional review of inorganic data from the facility and surrounding area in April 2001, the observed arsenic values were determined to represent naturally occurring levels. Because the identified human health risks associated with arsenic are now considered to be due to naturally occurring levels, arsenic was not retained as a COC, and remediation of arsenic in surface soil is not required at Site 16.
- Over the course of the investigations at this site, USEPA Region IV changed its screening criteria for evaluation of hazardous waste-related sites from the USEPA Region III Risk-Based Concentrations (RBCs) to the USEPA Region IX Preliminary Remediation Goals (PRGs) (USEPA, 2002). Therefore, analytical results are now compared to the USEPA Region IX PRGs and FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 2005).
- The inorganic constituents, aluminum, iron, manganese, and vanadium were detected above screening levels; however, there is no direct evidence of site-related use of these constituents at Site 16. Additionally, the detected concentrations of these inorganics are within the range of levels found at NAS Whiting Field (HLA, 2000). The technical memorandum "Inorganics in Soil at NAS Whiting Field" (TtNUS, 2005) presents the technical basis for this determination. Considering the information presented above, aluminum, iron, and vanadium are not considered constituents of potential concern (COPCs) for Site 16 surface and subsurface soils.

A summary of site risks is provided in Section 2.6 of this Record of Decision (ROD).

The ecological risk assessment (ERA) presented in the RI for Site 16 did identify unacceptable ecological risks at Site 16. A discussion of ecological risks is presented in Section 2.6.2.

The response action selected in this ROD is necessary to protect public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

## 1.4 DESCRIPTION OF THE SELECTED REMEDY

This ROD presents the final action for surface and subsurface soil at Site 16 and is based on the results of the RI (HLA, 2000), Feasibility Study (FS) (HLA, 2001), FS Addendum (FSA) (TtNUS, 2008a), and revised HHRA (TtNUS, 2006). This ROD only addresses surface and subsurface soil at Site 16; it does not address actual or potential groundwater contamination at the site. Groundwater at NAS Whiting Field has been identified as a separate site (Site 40, Basewide Groundwater) and will be addressed in a future decision document. There is no surface water or sediment at Site 16.

The selected remedy for Site 16 is Land Use Controls (LUCs) that will restrict future use of the site to non-residential/non-recreational activities involving less than full-time human contact and prohibit any excavation of surface and subsurface soil. The selected remedy was determined based on evaluation of site conditions, site-related risks, anticipated future land use, applicable or relevant and appropriate requirements (ARARs), and Remedial Action Objectives (RAOs).

These LUCs in the form of Institutional Controls (ICs) and engineering controls (ECs) will be implemented to prohibit residential development and eliminate unacceptable risks from exposure to contaminated soil.

ICs prohibiting residential or residential-like use and digging, disturbing, or removing of soil will be placed on an area of land slightly larger than the boundaries of Site 16 to ensure that an appropriate buffer zone is created. ECs in the form of warning signage will be placed along the boundary of the site.

The LUC performance objectives for Site 16 are as follows:

- Maintain the integrity of the remedial system, LUCs;
- Restrict the site to non-residential/non-recreational use only. Land use restrictions will prohibit residential or residential-like uses and recreational uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent and nursing care facilities; and
- Prohibit excavation or disturbance of the existing soil or removal of surface and/or subsurface soil off-site unless prior written approval is obtained by USEPA and FDEP.

The LUCs cover only surface and subsurface soil and will be implemented as described in Section 2.10 of this ROD.

The Navy shall prepare, in accordance with USEPA guidance, and submit a LUC Remedial Design (RD) to the USEPA and FDEP for review and approval. The Navy will also prepare and submit to the USEPA

and FDEP all other post-ROD documents as specified in the 2004 Department of Defense/USEPA Principles and Procedures for LUCs and Other Post-ROD Actions (LUC Principles).

## **1.5 STATUTORY DETERMINATIONS**

The LUC remedy selected for surface and subsurface soil at Site 16 is protective of human health and the environment, complies with federal and State ARARs, and is cost effective. This remedy does not satisfy the statutory preference for treatment as a principal element of the remedy (i.e., reduction in the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants through treatment as a principal element). Because this remedy will result in contaminants remaining on site in excess of residential risk-based levels, LUCs will be implemented to restrict the site to non-residential/non-recreational use only. Non-residential land use restrictions will prohibit residential or residential-like uses as specified in Section 1.4, LUC Performance Objectives. LUCs are also being implemented to ensure that RAOs are being achieved.

The remedy will result in hazardous substances, pollutants, or contaminants remaining on site at levels that do not allow for unrestricted use and unlimited exposure; therefore, in accordance with Section 121(c) of CERCLA and NCP 300.430(f)(5)(iii)(c), a statutory review will be conducted within 5 years of initiation of remedial action, and every five years thereafter, to ensure the remedy continues to be protective of human health and the environment. If the remedy is determined not to be protective of human health and the environment because the LUCs have failed, the Navy may be required to undertake additional remedial action.

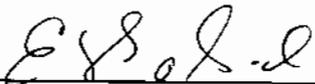
## **1.6 ROD DATA CERTIFICATION CHECKLIST**

The information required to be included in the ROD is summarized in Table 1-1. These data are presented in Section 2.0, Decision Summary, of this ROD. Additional information, if required, can be found in the NAS Whiting Field Administration Record file for Site 16.

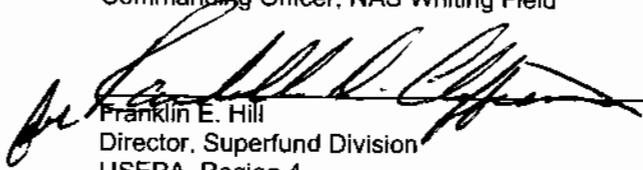
**TABLE 1-1**  
**DATA CERTIFICATION CHECKLIST**  
**OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA**  
**RECORD OF DECISION**  
**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

Information	ROD Reference
Constituents of concern (COCs)	Section 2.5.1.1 Page 2-7
Baseline risk represented by the COCs	Section 2.6.1 and 2.6.3 Pages 2-9 through 2-12
Cleanup goals (CGs) established for the COCs	Section 2.7.1 Page 2-13
Disposition of source materials constituting principal threat	Section 2.2 Page 2-1
Current and reasonably anticipated future land use scenarios used for risk assessment	Section 2.5.4 Page 2-8
Potential land uses available at the site as a result of the selected remedy	Section 2.10.4 Page 2-25
Estimated capital, operation and maintenance (O&M), and net present worth (NPW) costs, discount rate used, and time frame these costs are projected for the selected remedy	Section 2.10.3 Page 2-23 and Table 2-5 Page 2-24
Key factors leading to the selection of the remedy	Section 2.10.1 Page 2-17

1.7 AUTHORIZING SIGNATURES

  
\_\_\_\_\_  
Enrique L. Sadsad  
Captain, United States Navy  
Commanding Officer, NAS Whiting Field

25 SEP 08  
Date

  
\_\_\_\_\_  
Franklin E. Hill  
Director, Superfund Division  
USEPA, Region 4

10/8/2008  
Date

## 2.0 DECISION SUMMARY

### 2.1 SITE NAME, LOCATION, AND DESCRIPTION

Site 16, Open Disposal and Burning Area, is located along the southwestern facility boundary, directly west of the South Air Field near Clear Creek (Site 39) and is approximately 12 acres in size.

From 1943 to 1965, Site 16 served as the primary waste disposal area for NAS Whiting Field. Two large pits were used for the disposal of general refuse and waste from aircraft maintenance operations. Other wastes associated with aircraft maintenance and repair including paints, solvents, waste oil, hydraulic fluid, and wastewater from paint stripping operations were reportedly disposed of at the site.

At this time, Site 16 consists of vacant, unused land and is not fenced; however, access is controlled at the base perimeter security gate.

### 2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

#### 2.2.1 NAS Whiting Field History

NAS Whiting Field was placed on the National Priorities List (NPL) by the USEPA in June 1994. Following the listing of NAS Whiting Field on the NPL, remedial response activities have been conducted pursuant to CERCLA authority. The decision documents and remedy selection for NAS Whiting Field are developed by the Navy, the lead agency, and USEPA, a support agency, with concurrence from FDEP, a support agency.

The first environmental studies for the investigations of waste handling and/or disposal sites at NAS Whiting Field were conducted during the Initial Assessment Study (IAS) [Envirodyne Engineers, Inc. (EE), 1985]. The record search conducted during the IAS indicated that throughout its years of operation, NAS Whiting Field generated a variety of waste related to pilot training, operation and management of aircraft and ground support equipment, and facility maintenance programs. There have been no cited violations under federal or state environmental law or any past or pending enforcement actions pertaining to the cleanup of Site 16.

NAS Whiting Field presently consists of two airfields (North and South Fields) and serves as a naval aviation training facility providing support facilities for flight and academic training.

### 2.2.2 Site 16 History

From 1943 to 1965, the Site 16 area served as the primary waste disposal area for NAS Whiting Field. Two large pits were used for the disposal of general refuse and waste from aircraft maintenance operations. Other wastes associated with aircraft maintenance and repair including paints, solvents, waste oil, hydraulic fluid, and wastewater from paint stripping operations were reportedly disposed at the site. Dielectric fluids containing PCB may also have been disposed at the site. Annual disposal volumes are estimated to have been between 3,000 and 4,000 tons. To help reduce volumes, solid wastes were routinely burned using diesel fuel as an accelerant.

Recharged by storm water runoff, a small ephemeral wetland (less than 2 feet deep) is located along the eastern boundary of the site. Because much of the site was disturbed by the trench and fill operations, it is very likely that this wetland is the result of land subsidence of one of the trenches. No permanent surface water bodies exist in the immediate vicinity of the site.

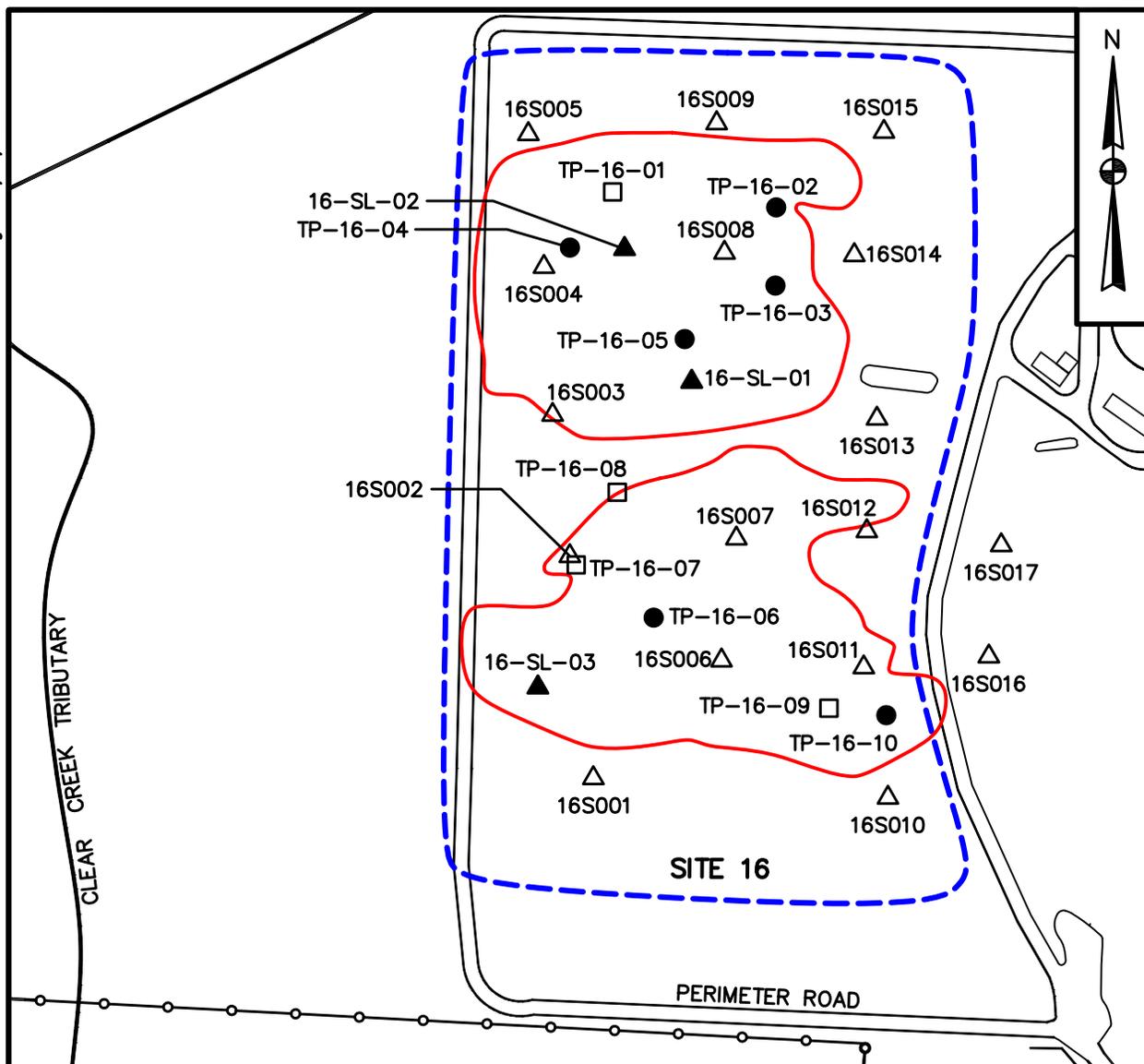
In May 2002, an Interim Remedial Action (IRA), an excavation, was conducted at Site 16 to address surface soil with concentrations of benzo(a)pyrene greater than the associated USEPA Region 9 residential PRG of 62 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) around the Phase IIB sample location 16S006 (Figure 2-1). The excavation area at Site 16 measured 45 feet by 20 feet and approximately 2 feet below land surface (bls). The area was previously determined to contain polynuclear aromatic hydrocarbon (PAH) contaminants greater than the industrial criterion of 290 milligrams per kilogram ( $\text{mg}/\text{kg}$ ).

Approximately 67 cubic yards (95.4 tons) of nonhazardous soil were removed, transported, and disposed of at the Springhill Landfill in Florida. Prior to completing the backfill, two subsurface soil samples (below 2 feet bls) were collected at the bottom of the excavation area and analyzed for PAHs and metals. The sampling results revealed subsurface soil PAH concentrations, specifically benzo(a)pyrene concentrations, in both of the excavation samples that slightly exceeded residential, direct exposure criteria per FDEP's Chapter 62-777, F.A.C. (CH2M Hill Constructors, Inc., 2002).

Past uses of hazardous waste (described above) at Site 16, although acceptable at the time, had the potential to cause long-term problems through the release of hazardous constituents into soil and groundwater. As part of the Installation Restoration (IR) Program and the Navy Assessment and Control of Installation Pollutants (NACIP) Program, Site 16 was included in the Verification Study for NAS Whiting Field [Geraghty & Miller, Inc. (G&M), 1986].

A surface soil assessment was conducted during the Site 16 RI in two phases (Phase IIA and IIB). Phase IIA (1992) included the collection of surface soil samples from three locations (16-SL-01 through 16-SL-03) and the collection of subsurface soil from five locations (TP-16-02 through TP-16-06). During the

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**LEGEND:**

- ▲ IIA SURFACE SOIL SAMPLE
- △ IIB SURFACE SOIL SAMPLE
- IIA SUBSURFACE SOIL SAMPLE
- TEST PIT LOCATION (NO SAMPLE COLLECTED)
- - - SITE BOUNDARY
- LANDFILL/DISPOSAL AREA

0 200 400  
GRAPHIC SCALE IN FEET

<b>DRAWN BY</b> MF	<b>DATE</b> 11/2/07
<b>CHECKED BY</b>	<b>DATE</b>
<b>REVISED BY</b>	<b>DATE</b>
<b>SCALE</b> AS NOTED	



**SOIL SAMPLING AND  
TEST PIT LOCATIONS  
SITE 16  
OPEN DISPOSAL AND BURN AREA  
RECORD OF DECISION  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

<b>CONTRACT NO.</b> 0006	
<b>OWNER NO.</b>	
<b>APPROVED BY</b>	<b>DATE</b>
<b>DRAWING NO.</b> FIGURE 2-1	<b>REV.</b> 0

Phase IIB field investigation (1996), surface soil samples were collected from 17 locations (16S001 through 16S017). Surface soil samples were also collected from eight locations (16S024 through 16S026, 16S028, and 16S032 through 16S035) during a 2001 field investigation associated with the IRA.

The Phase IIA and IIB surface soil samples were collected from a depth interval of 0 to 12 inches bls, and the Phase IIA subsurface soil samples were collected from depth intervals of 2 to 3.5 feet, 6 to 8 feet, 9 to 10 feet, 10.5 feet, and 12 feet bls. All soil samples were analyzed for Target Compound List (TCL) VOCs, SVOCs, pesticides and PCBs, Target Analyte List (TAL) metals, total recoverable petroleum hydrocarbons (TRPH), and cyanide.

During the RI, two VOCs, 15 SVOCs, eight pesticides and PCBs, 23 TAL metals, and cyanide were detected in surface soil and seven VOCs, 11 SVOCs, four pesticides and PCBs, 21 TAL metals, and cyanide were detected in subsurface soil at Site 16.

Table 2-1 summarizes the Site 16 investigative history.

### **2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

The Navy has conducted public participation activities in accordance with CERCLA and, to the extent practicable, the NCP throughout the CERCLA site cleanup process. The FS (HLA, 2001), FSA (TtNUS, 2008a) and Proposed Plan (TtNUS, 2008b) for Site 16 were made available to the public for review in August 2008. These documents, and other IR Program information, are contained within the NAS Whiting Field Administrative Record in the Information Repository at the West Florida Regional Library, Milton, Florida.

The notice of availability for all site-related documents was published in the Pensacola News Journal and Santa Rosa Press Gazette on August 13 and 15, 2008, respectively, which targeted the communities closest to NAS Whiting Field. The availability notice presented information on the RI, FS, and FSA at Site 16 and invited community members to submit written comments on the Proposed Plan.

A public comment period was held from August 15 through September 14, 2008, to solicit comments on the Proposed Plan. The comment period included an opportunity for the public to request a public meeting; however, a public meeting was not held because one was not requested. The site-related documents were placed in the Information Repository and made available for the public to review. Comments received during the public comment period are presented in the Responsiveness Summary in Appendix A.

**TABLE 2-1**  
**INVESTIGATIVE HISTORY**  
**RECORD OF DECISION**  
**OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA**  
**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

Date	Investigation	Activities	Findings
1986	Verification Study, Assessment of Potential Groundwater Pollution at NAS Whiting Field, Florida (G&M, 1986)	<ul style="list-style-type: none"> <li>• On-site survey and interviews</li> <li>• Installation of monitoring wells and groundwater sampling</li> </ul>	<ul style="list-style-type: none"> <li>• From 1943 to 1965, Site 16 served as the primary waste disposal area for NAS Whiting Field. Two large pits were used for the disposal of general refuse and waste from aircraft maintenance operations. Other wastes associated with aircraft maintenance and repair including paints, solvents, waste oil, hydraulic fluid, and wastewater from paint stripping operations, were reportedly disposed at the site.</li> <li>• Site 16 was recommended for additional investigation due to the potential for off-site migration and impact on human and ecological receptors.</li> </ul>
1992-2000	Remedial Investigation, Site 16, NAS Whiting Field, Milton, Florida (HLA, 2000)	<ul style="list-style-type: none"> <li>• Geophysical survey</li> <li>• Geological assessment</li> <li>• Hydrogeological assessment</li> <li>• Collection and analysis of surface and subsurface soil samples</li> <li>• Installation of groundwater monitoring wells and groundwater sampling</li> <li>• Soil gas survey</li> <li>• HHRA</li> <li>• ERA</li> </ul>	<ul style="list-style-type: none"> <li>• Groundwater flow direction is to the southwest across the site.</li> <li>• The HHRA determined that carcinogenic risk from exposure to surface soil may be unacceptable for current and future receptors.</li> <li>• The total Incremental lifetime cancer risk (ILCR) associated with exposure to soil by a hypothetical future resident and industrial worker exceeded FDEP's target level of concern (<math>1 \times 10^{-6}</math>) due to cPAHs.</li> <li>• The non-cancer risk associated with ingestion of and direct contact with soil under current and hypothetical future land uses were less than USEPA's and FDEP's target HI of 1.0.</li> <li>• The ERA did not predict unacceptable risks to ecological receptors from constituents present in surface and subsurface soil.</li> </ul>
2001	Feasibility Study (FS) for Site 16, NAS Whiting Field, Milton, Florida (HLA, 2001)	<ul style="list-style-type: none"> <li>• Evaluated remedial alternatives for site cleanup of COCs.</li> </ul>	<ul style="list-style-type: none"> <li>• 19 COCs identified for surface and subsurface soil.</li> </ul>
2006	Risk Assessment Re-Evaluation of Soils at Sites 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18, NAS Whiting Field, Milton, Florida (TtNUS, 2006)	<ul style="list-style-type: none"> <li>• Evaluated changed conditions at the site and changes in regulatory screening criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• Four COCs identified for surface and subsurface soil.</li> </ul>
2008	FS Addendum for Site 16, NAS Whiting Field, Milton, Florida (TtNUS, 2008a)	<ul style="list-style-type: none"> <li>• Evaluated remedial alternatives for site cleanup of COCs.</li> </ul>	<ul style="list-style-type: none"> <li>• Four COCs identified for surface and subsurface soil based on the Risk Assessment Re-Evaluation.</li> </ul>
2008	Proposed Plan, Site 16, NAS Whiting Field, Milton, Florida (TtNUS, 2008b)	<ul style="list-style-type: none"> <li>• Established public comment period from August 15 through September 14, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>• Proposed remedy: LUCs for Site 16 surface and subsurface soil.</li> <li>• No comments received.</li> </ul>

HHRA = Human health risk assessment  
ILCR = Incremental lifetime cancer risk  
ERA = Ecological risk assessment  
HI = Hazard index

FDEP = Florida Department of Environmental Protection  
USEPA = United States Environmental Protection Agency  
COCs = Constituents of concern

cPAHs = Carcinogenic polynuclear aromatic hydrocarbons  
LUCs = Land use controls

## **2.4 SCOPE AND ROLE OF OPERABLE UNIT 15 - SITE 16**

The environmental concerns at NAS Whiting Field are complex. The environmental work at NAS Whiting Field is part of the Navy's ongoing IR Program and has been organized into 27 OUs. OU 15 – Site 16 is the 24<sup>th</sup> OU to be addressed. Cleanup activities are being performed in accordance with the requirements of CERCLA; the Department of Defense Environmental Restoration Program (DERP); Executive Order 12580; USEPA-issued CERCLA guidances including, where practicable, the NCP; and other federal and state environmental and facility siting laws, regulations, guidance, and policies to the extent required by CERCLA. The only exceptions to this are those sites subject to the State of Florida's Petroleum Cleanup Program.

This ROD documents the selected remedy for Site 16 and presents the final response action as LUCs for surface and subsurface soil. Final RODs have been approved for OU 1 through OU 3; OU 5 and OU 6; OU 8 through OU 14; OU 16 and OU 22, OU 23, and OU 26 at NAS Whiting Field.

The groundwater at NAS Whiting Field has been designated as a separate site (OU 25 - Site 40, Basewide Groundwater) and is not addressed in this ROD.

Investigations at OU 15 - Site 16 indicated the presence of soil contamination from past operating practices. This contamination would pose an unacceptable human health risk if the site was used for residential purposes. The remedy documented in this ROD will achieve the RAOs for OU 15 - Site 16, as listed in Section 2.7. Implementation of this remedy will allow recreational reuse of the site, as indicated for the area in the NAS Whiting Field Master Plan, which is in accordance with the overall cleanup strategy for NAS Whiting Field of restoring the facility for beneficial reuse.

## **2.5 SITE CHARACTERISTICS**

The layout of Site 16 is shown on Figure 2-1. The land surface at the northern end of the site slopes gently to the west toward Clear Creek, which is located 450 feet west of the site. Although overland transport of surface water runoff toward Clear Creek is possible, most of the on-site rainfall infiltrates directly into the ground due to erosion control measures and the porous nature of the soil at Site 16.

There are currently no buildings at Site 16, and no permanent surface water sources exist at the site. Ground surface at the site is slightly depressed. It is also encircled and bisected, east to west, by a raised and unimproved dirt road. Vegetation consists of sparse native grasses and dense scrub oak vegetative cover in the central area. The boundary areas are predominantly covered with pine trees and dense scrub oak.

At this time, Site 16 consists of vacant, unused land and is not fenced; however, access is controlled at the base perimeter security gate.

The following sections summarize the nature and extent of contamination at Site 16. Further details of previous investigations and a complete list of all constituents and their detected concentrations in surface and subsurface soil are available in the RI Report for Site 16 (HLA, 2000).

## **2.5.1 Nature and Extent of Contamination**

As part of the RI conducted for Site 16, data were collected to determine the nature and extent of releases of site-derived contaminants in surface and subsurface soil. Data was also collected to identify potential pathways for migration of contaminants in surface and subsurface soil, and to evaluate risks to human and ecological receptors from these contaminants.

### **2.5.1.1 Surface Soil**

Surface soil sampling was conducted at Site 16 to determine the nature and extent of contamination at the site and to assess whether surface soil could potentially serve as an exposure pathway to human or ecological receptors.

Carcinogenic PAHs, specifically benzo(a)pyrene, were detected in four of 27 surface soil samples collected site-wide at concentrations exceeding both USEPA's PRGs and FDEP's SCTLs. In addition, the pesticide dieldrin was detected in two of 27 samples at concentrations exceeding both PRGs and SCTLs and the inorganics antimony, barium, chromium, copper, and lead were detected in various samples (ranging from 1 to 4 of 27) at concentrations exceeding SCTLs only.

Only cPAHs, barium, copper, and lead were identified as COCs for surface soil at Site 16 following the revised risk assessment.

### **2.5.1.2 Subsurface Soil**

Subsurface soil sampling was conducted at Site 16 to determine the nature and extent of contamination at the site and to assess whether subsurface soil could potentially serve as an exposure pathway to human or ecological receptors.

Several cPAHs were detected in one or more of five subsurface soil samples at concentrations exceeding both USEPA's PRGs and FDEP's SCTLs. In addition, the inorganics barium, cadmium, chromium and copper were detected in various samples (ranging from 1 to 5 of 5) at concentrations exceeding SCTLs

only. Lead was detected in 5 of 5 samples at concentrations exceeding PRGs and SCTLs and the maximum concentration of lead exceeded all screening levels.

Only barium, copper, and lead were identified as COCs for subsurface soil at Site 16 following the revised risk assessment.

### **2.5.2 Ecological Habitat**

Site 16 is limited in the quantity and quality of habitat for ecological receptors. Most importantly, the site comprises only a small portion of the home ranges of most wildlife, and the limited size and habitat of the site serves to restrict the amount of food available to upper trophic level organisms.

### **2.5.3 Migration Pathways**

The primary agents of migration acting on soil at Site 16 include wind, water, and human activity. Soil can also act as a source medium, allowing COCs to be transported to other media.

Transport of COCs from soil via wind is not expected to be a major transport mechanism based on the characteristics of the COCs and the presence of vegetation at Site 16, which is an effective means of limiting wind erosion of soil.

Human, and to a lesser extent ecological, receptors are effective at moving soil and can greatly affect the transport of soil-bound constituents. Under the current land use scenario at Site 16, human activity and ecological receptors are not major transport mechanisms for COCs in soil.

The transport of soil, and therefore COCs in soil, by water via the mechanisms of physical transport of soil and the leaching of constituents from soil to groundwater are potential concerns at Site 16. Soil erosion, the physical transport of soil via surface water runoff, is not considered a major mechanism for the transport of COCs in soil at Site 16 because of the following: (1) vegetation covering the site and (2) the nature of the constituents remaining in soil at the site. Leaching of constituents from soil to groundwater will be evaluated as part of the RI/FS for Site 40, Basewide Groundwater. As stated earlier, there is no permanent surface water or sediment present at Site 16.

### **2.5.4 Current and Potential Future Land and Resource Use**

The land at Site 16 is not currently used; however, the reasonably anticipated future land use at Site 16 is non-residential/non-recreational. This will be specified in the Base Master Plan (BMP) for NAS Whiting Field.

## **2.6 SUMMARY OF SITE RISKS**

An HHRA and an ERA were completed using soil data from the Site 16 RI to evaluate current and potential future threats to human health or the environment. The HHRA at Site 16 was revised in 2006 to evaluate the changed conditions (as discussed in Section 1.3) at the site, and changes in regulatory screening criteria that became effective since the original risk assessment was conducted. This section of the ROD summarizes the results of the revised HHRA and the ERA for Site 16, which provide the basis for taking action and selecting the remedial action for Site 16.

### **2.6.1 HHRA**

The Site 16 HHRA was revised to characterize the risks associated with potential exposures to site-related contaminants by human receptors. Details of the revised HHRA are provided in Section 10.0 of the *Risk Assessment Re-Evaluation of Soils, Sites 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 Report* (TtNUS, 2006).

#### **2.6.1.1 Risk Characterization**

Potential risks at Site 16 were estimated for five receptors (the hypothetical future resident, typical industrial worker, construction worker, maintenance worker, and recreational user/trespasser). Several constituents were detected at concentrations in excess of direct contact, risk-based COPC screening levels (SCTLs and PRGs) and consequently were retained as COPCs for surface and subsurface soil and evaluated in the quantitative HHRA. Quantitative risk estimates for potential human receptors were developed for the identified COPCs. Potential cancer risks and Hazard Index (HIs) were calculated, and the results are discussed below.

#### **Non-Carcinogenic Risk**

The non-cancer risk estimates or HIs for the hypothetical future resident exposed to surface soil did not exceed 1.0, indicating that adverse, non-carcinogenic health effects are not anticipated under a residential land use scenario and the conditions established in the exposure assessment. The cumulative HIs for the typical maintenance worker, industrial worker, construction worker, and recreational trespasser also did not exceed 1.0.

## **Carcinogenic Risk**

Cumulative Incremental Lifetime Cancer Risks (ILCRs) for exposures to surface and subsurface soil were less than or within USEPA's target risk range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  for all receptors. However, ILCRs calculated for two of the receptors exceed the State of Florida cancer risk benchmark. The ILCRs for the hypothetical resident exposed to surface soils and the construction worker exposed to subsurface soils exceeded the State of Florida's target risk level of  $1 \times 10^{-6}$  (Chapter 62-780.650, F.A.C) indicating that adverse carcinogenic health effects are anticipated under the conditions established in the exposure assessment. For the hypothetical resident, the primary contributors to the cancer risk estimates for surface soils were cPAHs. The ILCR for chromium exceeded  $1 \times 10^{-6}$  for exposures to subsurface soil by construction workers.

## **Risks from Lead**

Lead was identified as a COPC in surface soil and subsurface soil at Site 16. The maximum detected concentration of 759 mg/kg in surface soil and 766 mg/kg in subsurface soil exceeded the USEPA screening level of 400 mg/kg for residential exposures.

Hypothetical future residential exposures to lead in surface soil and subsurface soil were evaluated using the Integrated Exposure Uptake Biokinetic (IEUBK) lead model. The IEUBK average lead concentration of 103 mg/kg in surface soil results in less than 1 percent of future on-site child residents having a blood-lead level greater than 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) and results in a geometric mean blood-lead level of 2.5  $\mu\text{g}/\text{dL}$ . The IEUBK average lead concentration of 286 mg/kg in subsurface soil results in 3 percent of future on-site child residents having a blood-lead level greater than 10  $\mu\text{g}/\text{dL}$  and results in a geometric mean blood-lead level of 4.2  $\mu\text{g}/\text{dL}$ . These values do not exceed the USEPA goal of no more than 5 percent of children exceeding a 10  $\mu\text{g}/\text{dL}$  blood-lead level.

Exposures to lead in surface soil by construction workers and occupational workers were evaluated using a slope factor approach developed by USEPA for lead. For construction workers exposed to surface soil, the average lead concentration of 103 mg/kg results in 0.9 percent of the receptors (fetuses) having a blood-lead level greater than 10  $\mu\text{g}/\text{dL}$  and results in a geometric mean blood-lead level of 2.0  $\mu\text{g}/\text{dL}$ . For occupational workers exposed to surface soil, the lead concentration of 103 mg/kg results in 0.3 percent of receptors (fetuses) having a blood-lead level greater than 10  $\mu\text{g}/\text{dL}$  and results in a geometric mean blood-lead level of 1.5  $\mu\text{g}/\text{dL}$ . For construction workers exposed to subsurface soil, the lead concentration of 286 mg/kg results in 3.7 percent of receptors having a blood-lead level greater than 10  $\mu\text{g}/\text{dL}$  and a geometric mean blood-lead level of 3.0  $\mu\text{g}/\text{dL}$ . For occupational workers exposed to subsurface soil, the average lead concentration of 286 mg/kg results in 0.6 percent of receptors having a blood-lead level greater than 10  $\mu\text{g}/\text{dL}$  and a geometric mean blood lead level of 1.8  $\mu\text{g}/\text{dL}$ . These values

do not exceed the USEPA goal of no more than 5 percent of children (fetuses of exposed women) exceeding a 10 µg/dL blood-lead level.

### **Uncertainty Analysis**

General uncertainties associated with the risk estimation process and site-specific uncertainties are discussed or referenced in the RI. Uncertainties associated with the revised HHRA for surface and subsurface soil at Site 16 are summarized below:

- Overall site-related risks from soil may be overestimated by the background screening process.
- Potential risks are likely to be overestimated as a result of using the maximum concentration for the COCs.
- Risk is likely overestimated for the general populations exposed to the constituents in the environmental media at the site.

### **2.6.2 ERA**

A screening-level ERA was performed for Site 16 to evaluate the potential for adverse effects to ecological receptors at the site. Components of the screening-level ERA included; (1) preliminary problem formulation; (2) preliminary ecological effects evaluation; (3) preliminary exposure estimate; and (4) preliminary risk calculation. The ERA completed for Site 16 considered exposure of terrestrial plants, terrestrial invertebrates, and wildlife receptors to chemicals in soil at the site. All constituents detected in surface soil at Site 16, including VOCs, SVOCs, TRPH, pesticides/PCBs, and inorganic analytes, were evaluated during the screening-level assessment. The ERA identified a list of COPCs consisting of PAHs, pesticides, PCBs, and metals. The analyses indicated that potential risk appears to be limited primarily to the vicinity of sampling locations 16S007 and 16S011 (Figure 2-1). These locations contained elevated concentrations of multiple COPCs including lead and zinc.

Based on the ERA, potential ecological risk associated with COPCs at Site 16 is localized and not site wide. In addition, the site is severely limited in the quantity and quality of habitat. Most importantly, the site comprises only a small portion of the home ranges of most of the terrestrial wildlife species found on the base. Therefore, reduction in growth, survival, and reproduction of small mammal and bird populations at and near the site is unlikely. For these reasons, no unacceptable ecological risks were identified, and a further ecological study at Site 16 is unwarranted.

### 2.6.3 Risk Summary

The HHRA assessment considered five receptors; the hypothetical future resident, typical industrial worker, construction worker, maintenance worker, and recreational user, assuming exposure via ingestion, dermal contact, and inhalation.

cPAHs, barium, copper, and lead were identified as COCs for surface and subsurface soil based on a comparison of maximum detected concentrations to screening levels and all HHRA risk assessment calculations. Non-cancer risk estimates (HIs) for the hypothetical future resident exposed to surface soil did not exceed 1.0, indicating that adverse non-carcinogenic health effects are not anticipated under the conditions established in the exposure assessment. The non-cancer risk estimates for the typical industrial worker or the construction worker also did not exceed 1.0. The cancer risk estimate developed for the future resident hypothetically exposed to surface soil exceeded FDEP's target risk goal of  $1 \times 10^{-6}$  indicating that adverse carcinogenic health effects are anticipated under the conditions established in the exposure assessment. For most receptors, the primary contributors to the cancer risk estimates for surface soils were cPAHs. However, cancer risk estimates for the typical industrial worker and construction worker did not exceed the USEPA target risk range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ .

The ERA for surface and subsurface soil at Site 16 identified a list of COPCs consisting of PAHs, pesticides, PCBs, and metals. Based on the ERA, potential ecological risk associated with COPCs at Site 16 is localized and not site wide. In addition, the site is severely limited in the quantity and quality of habitat. Most importantly, the site comprises only a small portion of the home ranges of most of the terrestrial wildlife species found on the base. For these reasons, no unacceptable ecological risks were identified.

Based on USEPA baseline risk assessment guidance, remedial action is not generally warranted at sites where cumulative risk does not exceed the  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  risk range. However, the guidance also stipulates that risk less than  $1 \times 10^{-4}$  may still be considered unacceptable for site-specific reasons. At Site 16, the suspected presence of buried wastes and debris create the significant possibility that an unacceptable risk will occur if these materials are exposed during excavation or if soil erosion occurs. These site uncertainties warrant implementation of a remedy that precludes potential future exposure to such materials.

Considering these factors, it is in the lead agency's (Navy) current judgment that the selected remedy (LUCs) for Site 16 described in this ROD is warranted and necessary to protect public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment. Implementing LUCs prohibiting residential or residential-like and recreational land use and disturbance of soil at this site will allow the Navy to properly and effectively manage future land use at the site and to minimize potential threats to human health or the environment.

## 2.7 REMEDIAL ACTION OBJECTIVES

RAOs are medium-specific goals that define the objective of conducting remedial actions to protect human health and the environment. RAOs specify COCs, potential exposure routes and receptors, acceptable concentrations for a site, and provide a general description of what the remedial action will accomplish. RAOs typically serve as the basis for the remedial alternatives described in Section 2.8.

The RAOs for Site 16 are as follows:

- To preclude unacceptable human health carcinogenic risks associated with incidental ingestion, inhalation, and/or dermal contact with surface and subsurface soil contaminated with cPAHs and exposure to buried wastes and debris at the site.
- To preclude risks associated with incidental ingestion, inhalation, and/or dermal contact with surface and subsurface soil contaminated with barium, copper, and lead and exposure to buried wastes and debris at the site.

### 2.7.1 Cleanup Goals

Cleanup goals (CGs) establish acceptable exposure levels protective of human health and the environment. The following soil CGs were established for the Site 16 COCs.

COC	CG
cPAHs	0.062 mg/kg <sup>(1)</sup>
Barium	120 mg/kg <sup>(2)</sup>
Copper	150 mg/kg <sup>(2)</sup>
Lead	400 mg/kg <sup>(2)</sup>

(1) USEPA PRG, residential

(2) FDEP SCTL for direct exposure, residential

The CGs were used to determine the areas and volumes of surface and subsurface soil with the potential to impact human health under a residential land use scenario. The estimated area of contaminated soil exceeding the CGs and/or suspected to contain buried wastes and debris creating unacceptable risk based on potential exposure is 507,600 square feet, and the estimated volume is 37,600 cubic yards.

## 2.8 DESCRIPTION OF ALTERNATIVES

Based on changes in the evaluation criteria (Sections 1.3 and 2.6), the four remedial alternatives evaluated in the FS (HLA, 2001) for Site 16 required re-evaluation based on results of the revised HHRA (TtNUS, 2006). For further information on the remedial alternatives, refer to the FSA (TtNUS, 2008a), and the Proposed Plan for Site 16 (TtNUS, 2007b). The USEPA's Presumptive remedy guidance was applied to the site because Site 16 was utilized as a landfill. The following cleanup alternatives were developed by the Navy, USEPA, and FDEP and are summarized in Table 2-2:

**Alternative S16-1:** No Further Action (NFA)

**Alternative S16-2:** LUCs

**Alternative S16-3:** Soil Cover and LUCs

**Alternative S16-4:** Limited Soil Removal

These alternatives were developed in consideration of site risks, the current and reasonably anticipated future land use, federal and state ARARs and guidance, and the limited ecological habitat at Site 16. These alternatives primarily address protection of human health because, as discussed previously, no unacceptable ecological risk was identified. Detailed descriptions of the four alternatives are provided below.

**Alternative S16-1:** NFA (estimated total Net Present Worth [NPW] cost of \$0). This alternative is required by the NCP and CERCLA as a baseline for comparison with other alternatives. The NFA alternative assumes that no remedial action would occur (beyond the previous 2002 IRA). No remedial action treatment, LUCs, or monitoring of site conditions would be implemented under the NFA alternative. Alternative S16-1 does not meet chemical-specific ARARs. There are no location-specific ARARs at Site 16.

**Alternative S16-2:** LUCs (estimated total NPW cost \$103,000). This alternative addresses the principal threats through the implementation of LUCs for surface and subsurface soil. The LUCs would prohibit residential or residential-like and recreational future land use at the site. The LUCs would ensure that future access to soil at the site will be restricted. The LUCs for Site 16 would limit exposure to soil contamination through an excavation and/or digging prohibition and the use of warning signs. The LUCs would also restrict the site to non-residential and non-recreational land use only. Land use restrictions will prohibit residential or residential-like and recreational uses including, but not limited to, any form of

TABLE 2-2

**SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED  
RECORD OF DECISION  
OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

Alternative	Description of Key Components	Cost <sup>(1)</sup>	Duration <sup>(2)</sup>
<b>Alternative S16-1:</b> No Further Action	No additional remedial actions are performed at Site 16	\$0	NA
<b>Alternative S16-2:</b> LUCs	Post warning signs.  Implement LUCs to address contaminants in soil at concentrations in excess of residential standards. Submit a LUC RD to USEPA and FDEP that will detail the implementation plans to restrict the site to non-residential or residential-like uses and recreational uses. Excavation, disturbance, or removal of soils will also be prohibited unless prior written approval is obtained from NAS Whiting Field.	\$103,000 <sup>(3)</sup>	30 Years
<b>Alternative S16-3:</b> Soil Cover and LUCs	Construct soil cover for area of site with soil concentrations exceeding residential land use CGs.  Provide a vegetative cover for soil cover area.  Post warning signs.  Implement LUCs to address contaminants in soil at concentrations in excess of residential standards. Submit a LUC RD to USEPA and FDEP that will detail the implementation plans to restrict the site to non-residential or residential-like uses and recreational uses. Excavation, disturbance, or removal of soils will also be prohibited unless prior written approval is obtained from NAS Whiting Field.	\$1,003,000 <sup>(3)</sup>	30 Years
<b>Alternative S16-4:</b> Limited Soil Removal and LUCs	Conduct limited "hot spot" soil removal in areas of site with soil exceeding residential land use CGs.  Post warning signs.  Implement LUCs to address contaminants in soil at concentrations in excess of residential standards. Submit a LUC RD to USEPA and FDEP that will detail the implementation plans to restrict the site to non-residential or residential-like uses and recreational uses. Excavation, disturbance, or removal of soils will also be prohibited unless prior written approval is obtained from NAS Whiting Field.	178,000 <sup>(3)</sup>	30 Years

(1) Net present worth costs rounded to the nearest thousand dollars.

(2) A period of 30 years was chosen for present worth costing purposes only. Under CERCLA, remedial actions must continue until contaminants remaining on site reach levels that allow for unrestricted reuse and unlimited exposure.

(3) The cost for implementation of Alternative S16-2, S16-3, and S16-4 includes the cost of the required 5-year reviews.

CGs = Cleanup goals

FDEP = Florida Department of Environmental Protection

LUCs = Land use controls

RD = Remedial Design

USEPA = United States Environmental Protection Agency

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

NA = Not applicable

housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent or nursing care facilities.

Alternative S16-2 would achieve compliance with chemical-specific ARARs by implementing LUCs that would prevent exposure to surface and subsurface soil until that time. Compliance with action-specific ARARs would be achieved by proper implementation and maintenance of LUCs. There are no location-specific ARARs at Site 16.

**Alternative S16-3:** Soil cover and LUCs (estimated total NPW cost \$1,003,000). This alternative would provide containment of all surface and subsurface soil containing COCs at concentrations exceeding levels allowed for Florida residential sites and would include LUCs as described in Alternative S16-2 above. The soil cover would be constructed over the entire site and include all former disposal areas. The soil cover would consist of clean fill placed and compacted to a minimum thickness of 18 inches, and then 6 inches of topsoil would be placed on top of the clean fill for a total cover thickness of 24 inches. When complete, the cover would reduce runoff and infiltration and minimize direct contact risks. Post-closure monitoring and maintenance of the installed soil cover would be implemented. This program would include visual inspections and maintenance of the cover.

Alternative S16-3 would meet chemical-specific ARARs for surface and subsurface soil. Compliance with action-specific ARARs would be achieved by proper design and execution of the soil cover. There are no location-specific ARARs at Site 16.

**Alternative S16-4:** Limited Soil Removal and LUCs (estimated total NPW cost \$178,000). This alternative would provide a disposal option by combining limited "hot spot" soil removal with all the components of Alternative S16-2 (LUCs). "Hot spot" soil excavation would be used to remove impacted surface soil at three areas with levels of cPAHs and lead exceeding CGs. The excavations would consist of removing contaminated soil from three 20 foot by 20 foot areas to approximately 2 feet bls near sample locations 16S007, 16S011, and 16S012 (Figure 2-1). After all impacted soil within each excavation area is removed, each area would be backfilled with 2 feet of clean, native material, compacted, and revegetated. The excavated soil from Site 16 would be disposed of at an approved off-base Treatment, Storage, and Disposal Facility and/or landfill.

LUCs as described in alternative S16-2 would still be required at Site 16 under Alternative S16-4 because subsurface soil with COC concentrations exceeding CGs would remain on site.

## **2.9 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES**

This section summarizes the comparison of each of the soil remedial alternatives with respect to the nine criteria outlined in the NCP at 40 Code of Federal Regulations (CFR) 300.430(e)(9)(iii). These criteria are categorized as threshold, primary balancing, and modifying and are further explained in Table 2-3. A detailed analysis was performed for each alternative using the nine criteria to select a remedy. Further information on the detailed comparison of remedial alternatives is presented in the Site 16 FS (HLA, 2001) and FSA (TtNUS, 2008a). Table 2-4 presents a summary comparison of this analysis.

## **2.10 SELECTED REMEDY**

### **2.10.1 Summary of Rationale for Remedy**

The goals of the selected remedial action are to protect human health and the environment by eliminating, reducing, or controlling hazards posed by the site. Based on the consideration of the requirements of CERCLA, the NCP, the detailed analysis of alternatives, and public comments, Alternative S16-2 - LUCs was selected to address surface and subsurface soil at Site 16.

This remedy was selected for the following reasons:

- Concentrations of COCs remaining in soil exceed screening levels for a residential use scenario; however, they do not present an unacceptable threat to human health or the environment if future residential or residential-like and recreational land uses are prohibited at Site 16.
- No unacceptable ecological risks were identified.
- The reasonably anticipated future land use of the property at Site 16 is non-residential/non-recreational.

### **2.10.2 Remedy Description**

Soil contamination remains at Site 16 at concentrations precluding unrestricted use and unlimited exposure; therefore, the remedy consists of LUCs to address unacceptable risk. These LUCs in the form of ICs and ECs will be implemented to restrict the site to non-residential or residential-like use and non-recreational use and will prohibit excavation, disturbance, or removal of soils from the site unless prior written approval is obtained from USEPA and FDEP. Implementation of LUCs will eliminate unacceptable risks from exposure to contaminated soil.

**TABLE 2-3**  
**EXPLANATION OF REMEDY SELECTION CRITERIA**  
**RECORD OF DECISION**  
**OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA**  
**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

Criterion	Description
<b>Threshold</b>	<p><b>Overall Protection of Human Health and the Environment.</b> Addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering methods, and/or institutional controls.</p> <p><b>Compliance with ARARs.</b> CERCLA Section 121(d) and NCP §300.430(f)(1)(II)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, which are collectively referred to as ARARs, unless such ARARs are waived under CERCLA Section 121(d)(4). This criterion addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes or whether it provides a basis for invoking a waiver.</p>
<b>Primary Balancing</b>	<p><b>Long-Term Effectiveness and Permanence.</b> Refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time after cleanup levels have been met. Also includes consideration of residual risk that will remain on site following remediation and the adequacy and reliability of controls.</p> <p><b>Reduction of Contaminant Toxicity, Mobility, and Volume Through Treatment.</b> Refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.</p> <p><b>Short-Term Effectiveness.</b> Addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.</p> <p><b>Implementability.</b> Addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other government entities are also considered.</p> <p><b>Cost.</b> The benefits of implementing a particular alternative are weighted against the cost of implementation.</p>
<b>Modifying</b>	<p><b>State/Support Agency Acceptance.</b> The FDEP is provided an opportunity to review the selected remedy and concur. The final Feasibility Study Addendum and the Proposed Plan are then placed in the Administrative Record, representing a consensus by the Navy, USEPA, and FDEP.</p> <p><b>Community Acceptance.</b> The Navy assesses community acceptance of the preferred alternative by giving the public an opportunity to comment on the remedy selection process and the preferred alternative and then responds to those comments.</p>

**TABLE 2-4**  
**SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES**  
**RECORD OF DECISION**  
**OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA**

**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

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<b>Evaluation Criterion</b>	<b>Soil Alternative 1: No Further Action</b>	<b>Soil Alternative 2: LUCs</b>	<b>Soil Alternative 3: Soil Cover and LUCs</b>	<b>Soil Alternative 4: Limited Soil Removal and LUCs</b>
Overall Protection of Human Health and Environment	Would not be protective of human receptors exposed to soil at the site.	Would be protective of human receptors. LUCs would prevent unacceptable potential exposure because the site will be restricted to non-residential use and non-recreational use. LUCs would also prohibit excavation, disturbance, or removal of soils from the site unless prior written approval is obtained.	Would be very protective because all surface and subsurface soil with concentrations exceeding CGs would be covered, eliminating the risk of exposure. LUCs would prevent potential future residents from coming into contact with soil. Would also provide protection to ecological receptors.	Would be very protective because all surface soil with concentrations exceeding CGs would be removed, eliminating the risk of exposure. LUCs would prevent potential future residents from coming into contact with soil. Would also provide protection to ecological receptors.
Compliance with ARARs: Chemical-Specific Location-Specific Action-Specific	Not applicable Not applicable Would not comply	Not applicable Not applicable Would comply	Not applicable Not applicable Would comply	Not applicable Not applicable Would comply
Long-Term Effectiveness and Permanence	Would not have long-term effectiveness and permanence because contaminants would remain on site.	Would provide long-term effectiveness and permanence through LUCs restricting the site to non-residential use and non-recreational use. LUCs would also prohibit excavation, disturbance, or removal of soils from the site unless prior written approval is obtained. Would require long-term management to be administered by the facility through implementing an approved LUC RD and 5-year reviews.	Would provide high level of long-term effectiveness and permanence by covering all impacted soil with concentrations exceeding residential cleanup levels, reducing residual risk from impacted soil at the site, and implementing LUCs restricting the site to non-residential use and non-recreational use. LUCs would also prohibit excavation, disturbance, or removal of soils from the site unless prior written approval is obtained. Would require long-term management and five-year reviews. LUCs would be administered by the facility through implementing an approved LUC RD.	Would provide high level of long-term effectiveness and permanence by removing impacted surface soil with concentrations exceeding residential cleanup levels, reducing residual risk from impacted soil at the site, and implementing LUCs restricting the site to non-residential use and non-recreational use. LUCs would also prohibit excavation, disturbance, or removal of soils from the site unless prior written approval is obtained. Would require long-term management and five-year reviews. LUCs would be administered by the facility through implementing an approved LUC RD.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment.	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment.	Would permanently and significantly reduce mobility of contaminants by covering impacted soil. Volume of impacted soil would not be reduced.	Would permanently and significantly reduce mobility of contaminants by removing impacted soil. Volume of impacted soil would be reduced.

**TABLE 2-4**  
**SUMMARY OF COMPARATIVE ANALYSIS OF SOIL REMEDIAL ALTERNATIVES**  
**RECORD OF DECISION**  
**SITE 16, OPEN DISPOSAL AND BURNING AREA**  
**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

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<b>Evaluation Criterion</b>	<b>Soil Alternative 1: No Further Action</b>	<b>Soil Alternative 2: LUCs</b>	<b>Soil Alternative 3: Soil Cover and LUCs</b>	<b>Soil Alternative 4: Limited Soil Removal and LUCs</b>
Short-Term Effectiveness	Would not result in short-term risks to site workers or adversely impact the surrounding community and would not achieve the soil RAOs and CGs.	Would not result in short term risks to site workers or adversely impact the surrounding community and would not achieve the soil CGs.  Estimated time to reach RAOs is less than 1 year.	Would create short-term risks of workers and potential fugitive dust during soil cover construction. Environmental impacts (fugitive dust and runoff) are expected to be minimal. Engineering controls would minimize any environmental impacts. RAOs and CGs would be met within less than 1 year.	Would create short-term risks of workers and potential fugitive dust during soil excavation. Environmental impacts (fugitive dust and runoff) are expected to be minimal. Engineering controls would minimize any environmental impacts. RAOs and CGs would be met within less than 1 year.
Implementability	Would be simple to implement because no action would occur.	Would be easily implemented. Equipment, specialists, and materials for this alternative are readily available.	Would be easily implemented. This remedial technology is proven and reliable. Equipment, specialists, and materials for this alternative are readily available.	Would be easily implemented. This remedial technology is proven and reliable. Equipment, specialists, and materials for this alternative are readily available.
Cost:				
Capital	\$0	\$25,000	\$925,000	\$99,000
NPW O&M (30 year)	\$0	\$78,000*	\$78,000*	\$78,000*
Total cost, NPW (30 years)	\$0	\$103,000	\$1,003,000	\$178,000

CGs = Cleanup Goals  
LUCs = Land use controls  
NPW = Net present worth  
RAOs = Remedial Action Objectives  
RD = Remedial Design  
ARARs = applicable or relevant and appropriate requirement  
O&M = operation & management

\*Includes the cost of 5-year reviews

ICs restricting the site to non-residential or residential-like use, recreational use, and prohibiting excavation, disturbance, or removal of soils, will be placed on an area of land slightly larger than the boundaries of Site 16 to ensure that an appropriate buffer zone is created. ECs in the form of warning signage will be placed along the boundary of the site. Figure 2-2 presents the approximate LUC boundaries for Site 16.

The LUC performance objectives for Site 16 are as follows:

- Maintain the integrity of the remedial system, LUCs;
- Restrict the site to non-residential/non-recreational use only. Land use restrictions will prohibit residential or residential-like uses and recreational uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent and nursing care facilities; and
- Prohibit excavation or disturbance of the existing soil or removal of surface and/or subsurface soil off-site unless prior written approval is obtained by USEPA and FDEP.

The LUCs cover only surface and subsurface soil and will be implemented as follows:

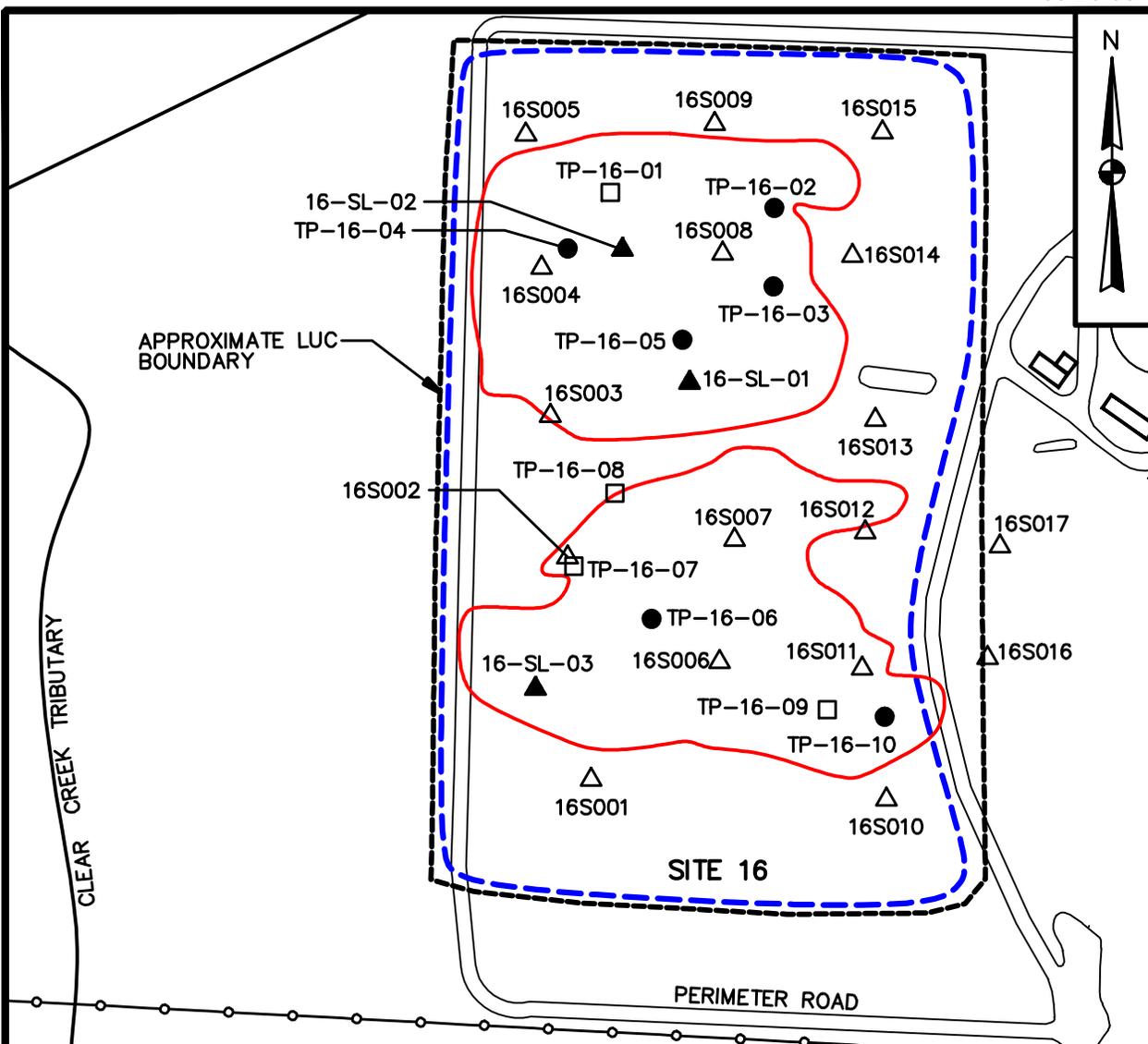
Institutional Controls:

- The designated boundaries for LUCs at Site 16 (as presented on Figure 2-2) and all prohibited uses will be annotated via text and figure/map in the NAS Whiting Field BMP;
- The boundaries of Site 16 and all prohibited uses will be annotated in the NAS Whiting Field geographical information system (GIS).
  - The NAS Whiting Field BMP will require that the BMP and GIS be consulted prior to excavation or construction activity on NAS Whiting Field to ascertain whether the activity is consistent with the LUC performance objectives described in this ROD;
- In the event of property transfer outside federal ownership, the LUC performance objectives will be effectuated in deed restrictions and/or notifications.

Engineering Controls:

- Warning signs will be posted along the boundary of Site 16. The signage will advise that site access is restricted and digging is prohibited. The location, size, and wording of the signs will be designated in the LUC RD and will be approved by the Navy, USEPA, and FDEP.

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**LEGEND:**

- ▲ IIA SURFACE SOIL SAMPLE
- △ IIB SURFACE SOIL SAMPLE
- IIA SUBSURFACE SOIL SAMPLE
- TEST PIT LOCATION (NO SAMPLE COLLECTED)
- SITE BOUNDARY
- LANDFILL/DISPOSAL AREA
- APPROXIMATE LUC BOUNDARY

0 200 400  
GRAPHIC SCALE IN FEET

DRAWN BY MF	DATE 11/2/07
CHECKED BY	DATE
REVISED BY	DATE
SCALE AS NOTED	



APPROXIMATE LUC BOUNDARY  
SITE 16  
OPEN DISPOSAL AND BURN AREA  
RECORD OF DECISION  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA

CONTRACT NO. 0006	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. FIGURE 2-2	REV. 0

The LUCs will restrict future use of the site to non-residential or residential like activities which will minimize human contact with surface and subsurface soil.

The LUCs will be implemented and maintained by the Navy until the concentrations of hazardous substances in surface and subsurface soil at the site have been reduced to levels that allow for unrestricted use and unlimited exposure. The Navy or any subsequent owners shall not modify, delete, or terminate any LUC without USEPA and FDEP concurrence.

The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs described in this ROD. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity. Should any LUC remedy fail, the Navy will ensure that appropriate actions are taken to reestablish the remedy's protectiveness and may initiate legal action to either compel action by a third party(ies) and/or to recover the Navy's costs for remedying any discovered LUC violation(s).

The LUC implementation actions, including site monitoring and enforcement requirements, will be provided in a LUC RD that will be prepared by the Navy. Within 90 days of ROD signature, the Navy shall prepare and submit to USEPA and FDEP for review and approval the LUC RD for Site 16, which shall contain such requirements including implementation and maintenance actions as well as periodic inspections. The Navy will maintain, monitor, and enforce the LUCs according to the LUC RD. LUCs have been developed in accordance with the Principles and Procedures for Specifying, Monitoring, and Enforcement of LUCs and Other Post-ROD Actions, per a letter dated on October 2, 2003, from Raymond F. DuBois, Deputy Under Secretary of Defense (Installations and Environment), to Hon. Marianne Lamont Horinko, Acting Administrator, USEPA.

### **2.10.3 Summary of Estimated Remedy Costs**

The estimated total NPW cost of Alternative S16-2 at Site 16 is approximately \$103,000 over a 30-year period, based on an annual discount rate of 6 percent. Table 2-5 summarizes the cost estimate data for Alternative S16-2. The information is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD Amendment. The estimate is an order-of-magnitude engineering cost estimate expected to be within 25 percent of the actual project cost.

**2.10.4 Expected Outcome of the Selected Remedy**

Immediately upon implementation of the selected remedy (LUCs), Site 16 will be acceptable for future industrial land use.

**TABLE 2-5**

**SELECTED ALTERNATIVE COST ESTIMATE SUMMARY  
RECORD OF DECISION  
OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

<b>CAPITAL COSTS</b>	
<b>Description</b>	<b>Cost</b>
1. Project Planning	\$1,379
2. LUC Implementation	<u>\$20,019</u>
Subtotal	\$21,398
Contingency Allowance (10%)	\$2,140
Engineering/Project Management (5%)	<u>\$1,070</u>
<b>Total Capital Cost</b>	<b>\$24,608</b>
<b>OPERATION AND MAINTENANCE COSTS</b>	
<b>Description</b>	<b>Cost</b>
1. Total Operation and Maintenance Costs (including 5-year reviews)	<b>\$78,301</b>
<b>Total Net Present Worth Cost for Selected Alternative</b>	<b>\$102,909</b>

The expected outcome of the selected remedy may be summarized as follows:

- Human exposure to COCs in soil at concentrations in excess of CGs will be effectively eliminated.
- Soils remaining in place with contaminant concentrations above SCTLs will require LUCs to restrict the site to non-residential/non-recreational use only. Land use restrictions will prohibit residential or residential-like uses and recreational uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent and nursing care facilities.
- Excavation, disturbance, or removal of the surface and/or subsurface soils will also be prohibited unless prior written approval is obtained by USEPA and FDEP.
- These LUCs will be in effect at Site 16 until the concentrations of COCs in surface and subsurface soil at the site have been reduced to levels that allow for unrestricted use and unlimited exposure.

## **2.11 STATUTORY DETERMINATIONS**

The alternative selected for Site 16, Alternative S16-2, is consistent with the Navy's IR program, CERCLA, and the NCP. Under CERCLA §121 and the NCP, the selected remedy must be protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), be cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The following sections discuss how the selected remedy meets these statutory requirements. Comparison of the selected remedy to the nine USEPA remedy selection criteria is summarized in Table 2-6.

### **2.11.1 Protection of Human Health and the Environment**

The selected remedy, Alternative S16-2, will protect human health and the environment. The selected remedy eliminates, reduces, or controls risks by implementing LUCs to: (1) restrict future use of the site to non-residential use and non-recreational use only. These restrictions prohibit residential or residential-like uses and (2) prohibit excavation, disturbance, or removal of existing soils unless prior written approval is obtained from USEPA and FDEP.

**TABLE 2-6**  
**SUMMARY EVALUATION OF SELECTED REMEDY**  
**RECORD OF DECISION**  
**OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA**  
**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

Evaluation Criterion	Assessment
<b>Threshold Criteria:</b>	
Overall Protection of Human Health and the Environment	Human receptors will be protected if this alternative is implemented. Regulatory controls (i.e., LUCs) will prohibit potential future residents from exposure to soil at the site because residential and residential-like uses of the site will be prohibited by the proposed LUCs. LUCs will also prohibit excavation, disturbance or removal of existing soil at the site unless prior written approval is obtained.
Compliance with ARARs	This alternative prevents exposure to surface and subsurface soil with concentrations exceeding CGs by implementing LUCs and will meet chemical-specific ARARs. It meets action-specific ARARs by proper implementation and maintenance of the LUCs. There are no location-specific ARARs.
<b>Primary Balancing Criteria:</b>	
Long-Term Effectiveness	The risks to future workers or trespassers for exposure to surface and subsurface soil at the site are addressed by implementing LUCs. The long-term effectiveness and permanence will be controlled by NAS Whiting Field through the implementation of an approved LUC RD.  Administrative actions proposed in this alternative (e.g., 5-year site reviews) will provide a means of evaluating the effectiveness of the alternative. These administrative actions are considered to be reliable controls if the facility implements the approved LUC RD.
Reduction of Toxicity, Mobility, and Volume through Treatment	This alternative does not treat soil contaminants and thus does not reduce the toxicity, mobility, or volume through treatment.
Short-Term Effectiveness	The implementation of this alternative is estimated to take less than 1 year. No adverse impacts are expected as a result of implementing LUCs.
Implementability	Easily implemented.
Cost	The total net present worth cost of Alternative S16-2 is \$103,000.
<b>Modifying Criteria:</b>	
Federal and State Acceptance	USEPA approves and FDEP concurs with the selected remedy.
Community Acceptance	The community was given the opportunity to review and comment on the selected remedy. No comments were received and no public meeting was requested (see Appendix A). Therefore, the remedial action proposed in the Proposed Plan was not altered.

ARARs = Applicable or Relevant and Appropriate Requirements  
FDEP = Florida Department of Environmental Protection  
LUCs = Land use controls  
RD = Remedial Design  
USEPA = United States Environmental Protection Agency  
CGs = Cleanup goals

### **2.11.2 Compliance with ARARs**

CERCLA Section 121(d) specifies in part that remedial actions for cleanup of hazardous substances must comply with requirements and standards under federal or more stringent state environmental laws and regulations that are applicable or relevant and appropriate (i.e., ARARs) to the hazardous substances or particular circumstances at a site or that obtain a waiver (see also 40 CFR 300.430(f)(1)(ii)(B)). ARARs include only federal and state environmental or facility citing laws/regulations and do not include occupational safety or worker protection requirements. In addition, per 40 CFR 300.405(g)(3), other advisories, criteria, or guidance may be considered in determining remedies [so-called To-Be-Considered (TBC) criteria].

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that, although not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site, their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

In accordance with 40 CFR 300.400(g), the Navy, FDEP, and USEPA have identified the specific ARARs for the selected remedy. The selected remedy is expected to comply with all ARARs related to implementing the selected action. Table 2-7 lists the ARARs associated with implementation of the selected remedy.

### **2.11.3 Cost Effectiveness**

The selected remedy, Alternative S16-2, is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" [NCP §300.430(f)(1)(ii)(D)]. This was accomplished by evaluating the "overall effectiveness" of the alternative that satisfied the threshold criteria (i.e., protective of human health and the environment and ARAR compliant). Overall effectiveness

**TABLE 2-7**  
**SUMMARY OF FEDERAL AND STATE ARARs SPECIFIC TO THE SELECTED REMEDY**  
**RECORD OF DECISION**  
**OU 15 - SITE 16 - OPEN DISPOSAL AND BURNING AREA**  
**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**

<b>Requirement</b>	<b>Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Evaluation/Action To Be Taken</b>
<b>Chemical-Specific</b>				
Florida Contaminant Cleanup Target Levels	Chapter 62-777.170 Table II, F.A.C.	Relevant and Appropriate	This rule provides default cleanup target levels (CTLs) for soil that are derived from calculations using a lifetime excess cancer risk level of 1.0E-6 and a hazard quotient of 1 or less.	CTLs for soil in Table II of this rule were used to compile the COCs in soil at this site. Soil CTLs in Table II were also used to determine the need for remedial action and to determine the boundary for the land use control.
<b>Action-Specific</b>				
Florida Hazardous Waste – Requirements for Remedial Action	Chapter 62-730.225(3), F.A.C.	Applicable	Requires warning signs at sites suspected or confirmed to be contaminated with hazardous wastes	This requirement will be met.

F.A.C. = Florida Administrative Code  
CTLs = Cleanup Target Levels  
COCs = Constituents of Concern

was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs, and hence Alternative S16-2 represents a reasonable value for the money spent. The estimated 30-year NPW cost of the selected remedy is \$103,000.

#### **2.11.4 Utilization of Permanent Solutions and Alternative Treatment Technologies**

The Navy and USEPA, in consultation with FDEP, have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at Site 16. Of those alternatives that are protective of human health and the environment and comply with ARARs, the Navy and USEPA, in consultation with FDEP, has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria while also considering the statutory preference for treatment as a principle element and bias against off-site treatment and disposal and considering state and community acceptance.

#### **2.11.5 Five-Year Review Requirement**

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unrestricted use and unlimited exposure, in accordance with Section 121(c) of CERCLA and NCP §300.430(f)(5)(iii)(c), a statutory review will be conducted within 5 years of initiation of remedial action and every 5 years thereafter to ensure that the remedy continues to be protective of human health and the environment.

### **2.12 DOCUMENTATION OF SIGNIFICANT CHANGES**

No comments were received from the public during the comment period; therefore, no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

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**APPENDIX A**

**COMMUNITY RELATIONS  
RESPONSIVENESS SUMMARY**

## **Responsiveness Summary**

### **Site 16, Open Disposal and Burning Area Naval Air Station Whiting Field Milton, Florida**

A public comment period on the Site 16 Proposed Plan was held from August 15, 2008 through September 14, 2008. No public comments were received, and a public meeting was not held because one was not requested.