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NAS WHITING FIELD  
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FINAL FEASIBILITY STUDY ADDENDUM FOR SITE 16 NAS WHITING FIELD FL  
8/13/2008  
TETRA TECH NUS

# Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-94-D-0888



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## Feasibility Study Addendum 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

Contract Task Order 0369

August 2008



NAS Jacksonville  
Jacksonville, Florida 32212-0030

**FEASIBILITY STUDY ADDENDUM  
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**

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**AUGUST 2008**

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This document, *Feasibility Study Addendum for Operable Unit 15 - Site 16, Open Disposal and Burning Area, Surface and Subsurface Soil, Naval Air Station Whiting Field, Milton, 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. This document was prepared for Naval Air Station Whiting Field, Milton, Florida, and should not be construed to apply to any other site.

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## ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
ARAR	Applicable or relevant and appropriate requirements
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CG	Cleanup goals
COC	Constituent of concern
COPC	Constituent of potential concern
cPAH	Carcinogenic polynuclear aromatic hydrocarbon
EC	Engineering Controls
ERA	Ecological Risk Assessment
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FS	Feasibility Study
FSA	Feasibility Study Addendum
GIR	General Information Report
HHRA	Human Health Risk Assessment
HI	Hazard index
HLA	Harding Lawson and Associates, Inc.
IC	Institutional Controls
ILCR	Incremental Lifetime Cancer Risk
IRA	Interim Remedial Action
LUCs	Land Use Controls
mg/kg	Milligrams per kilogram
µg/kg	Micrograms per kilogram
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command Southeast
NFA	No Further Action
NPW	Net Present Worth
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRG	Preliminary Remediation Goal
RAGS	Risk Assessment Guidance for Superfund
RAO	Remedial Action Objective
RBC	Risk-Based Concentration

**ACRONYMS (Continued)**

RI	Remedial Investigation
SCTL	Soil Cleanup Target Level
SVOC	Semi-Volatile Organic Compound
TBC	To Be Considered
TSDf	Treatment, Storage, and Disposal Facility
TtNUS	Tetra Tech NUS, Inc.
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

## 1.0 INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS), under contract N62467-94-D-0888 to the Department of the United States Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE), is submitting this Feasibility Study Addendum (FSA) to address certain regulatory revisions and supplemental investigative findings at Site 16, Open Disposal and Burning Area, since the original Feasibility Study (FS) was submitted in March 2001 [Harding Lawson and Associates, Inc. (HLA), 2001]. The original FS addressed surface and subsurface soils at Naval Air Station (NAS) Whiting Field; Site 16.

The regulatory revisions and supplemental investigative findings impacting Site 16 addressed in this FSA include:

- Arsenic originally identified as a constituent of concern (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 [Florida Department of Environmental Protection (FDEP), 2001]. Because the identified human health risks associated with arsenic are now considered to be due to naturally occurring levels, arsenic will not be 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, United States Environmental Protection Agency (USEPA) Region IV changed its screening criteria for evaluation of hazardous waste-related sites from USEPA Region III Risk-Based Concentrations (RBCs) to USEPA Region IX Preliminary Remediation Goals (PRGs) (USEPA, 2004). Therefore, analytical results are now compared to the USEPA Region IX PRGs and FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 2005).
- The process and procedures at Site 16 did not likely contribute to the presence of the individual metal constituents, aluminum, iron, and vanadium in soil. Additionally, the site-specific values for these inorganics are within the typical range of levels found at NAS Whiting Field. 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.

## 1.1 PURPOSE

The purpose of this FSA is to evaluate the impact of the changes discussed above on the remedial alternatives for surface and subsurface soil at Site 16 at NAS Whiting Field. Remedial Alternatives were developed in the original FS (HLA, 2001). The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Municipal Landfill Presumptive Remedy to Military Landfills guidance was considered at Site 16. The application of the selected remedy at Site 16 will be consistent with the guidance.

The specific items to be evaluated include:

- Soil screening criteria changed to USEPA Region IX PRGs
- Revised Human Health Risk Assessment (HHRA) and COC selection

The revised HHRA and methodology used to evaluate constituent concentrations in surface and subsurface soil at Site 16 at NAS Whiting Field are detailed in the *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). These sites were previously evaluated in 1999 and 2000 using the methodology described in the General Information Report (GIR) [ABB Environmental Services, Inc. (ABB-ES), 1998], the Remedial Investigation (RI) Report (HLA, 2000), and the FS (HLA, 2001). The risk assessments for these sites were re-evaluated and updated to assure they are in compliance with current USEPA, State of Florida, and Navy guidance/methods. In addition, the re-evaluation was completed and any risk assessment results with potential impact on risk management decisions for these sites were updated.

## 1.2 REPORT ORGANIZATION

This FSA is organized into the following four chapters:

- Chapter 1.0 presents the purpose of the FSA.
- Chapter 2.0 discusses environmental conditions at the site.
- Chapter 3.0 presents the revised remedial action objectives (RAOs).
- Chapter 4.0 presents and discusses amended remedial alternatives.

## 2.0 ENVIRONMENTAL CONDITIONS

Site 16 is approximately 12 acres in size and is located in the southwestern part of the facility, directly west of the South Air Field. At the time of the RI field investigation, Site 16 was forested with pine trees. 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 sandy soil at Site 16. In the past, significant surface erosion was evident at several areas where no vegetation was present, and no berms were evident to control surface soil erosion.

From 1943 to 1965, this 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 of at the site. Dielectric fluids containing polychlorinated biphenyl (PCB) may also have been disposed of 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 incinerated using diesel fuel as an accelerant.

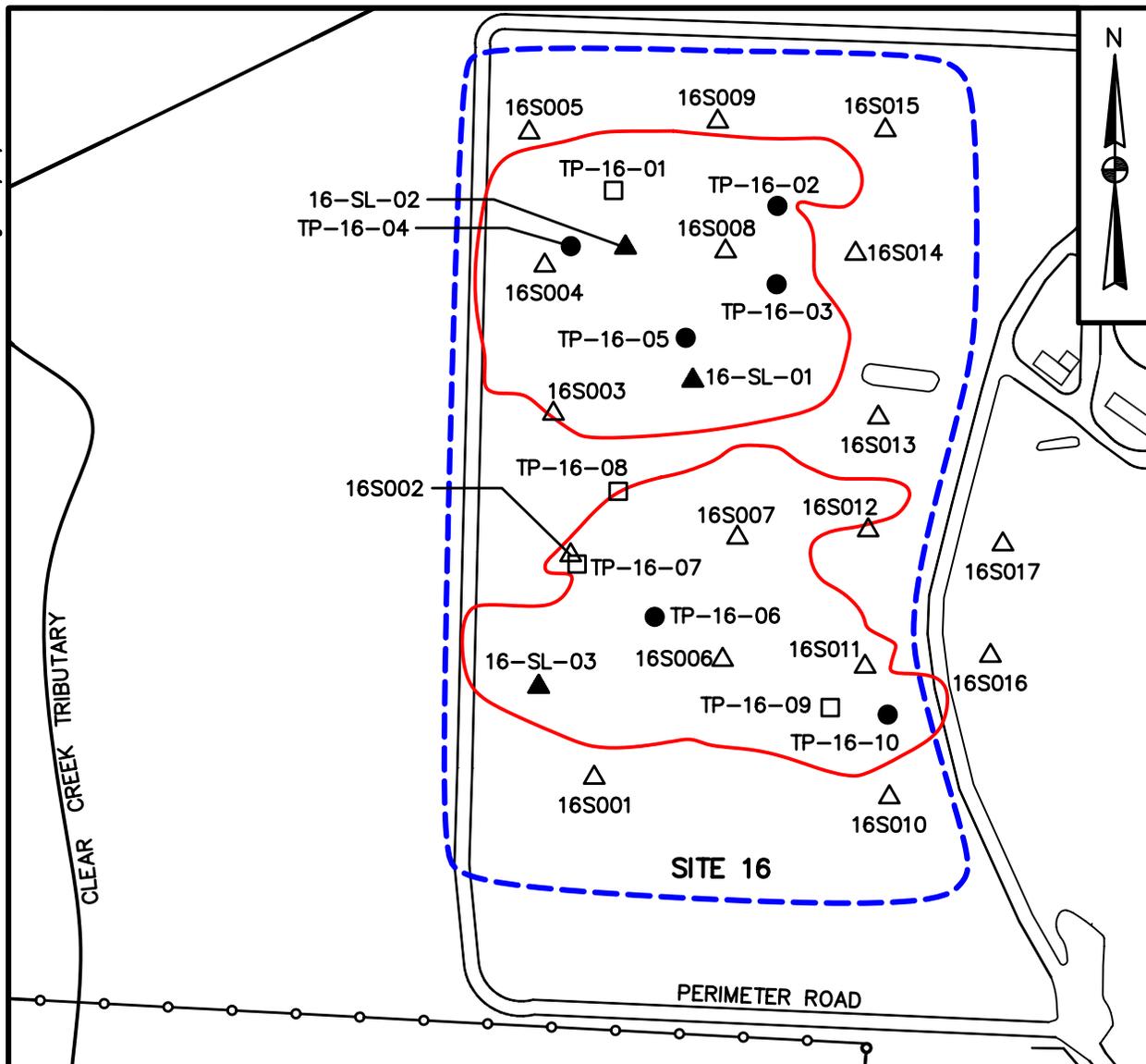
Recharged by storm water runoff, a small ephemeral wetland (less than 2 feet deep) is located along the eastern boundary of the site. Because much of the site was disturbed by the trench and fill operations, it is very likely this wetland is the result of land subsidence of one of the trenches. No permanent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

The approximate location of Site 16 and surface and subsurface soil sample locations are presented on Figure 2-1.

In May of 2002, an Interim Remedial Action (IRA) was conducted at Site 16 to address surface soil that exhibited concentrations of benzo(a)pyrene above the associated USEPA Region IX residential PRG of 62 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) around the RI Phase IIB sample location 16S006 (CH2M Hill Constructors, Inc., 2002).

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 above the industrial criteria of 290 milligrams per kilogram ( $\text{mg}/\text{kg}$ ). Approximately 67 cubic yards (95 tons) of nonhazardous soil were removed, transported, and disposed of at the Springhill Landfill

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**LEGEND:**

- ▲ 11A SURFACE SOIL SAMPLE
- △ 11B SURFACE SOIL SAMPLE
- 11A 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	



**FEASIBILITY STUDY ADDENDUM  
SITE 16  
OPEN DISPOSAL AND BURN AREA  
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

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 benzo(a)pyrene concentrations in one of the excavation samples slightly exceeded the residential SCTL.

There are currently no buildings at Site 16. No permanent surface water sources exist at Site 16. Ground surface at the site is slightly depressed, encircled, and bisected east to west by a raised, unimproved dirt road. Vegetation consists of sparse native grasses and abundant or 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.

## **2.1 NATURE AND EXTENT OF CONTAMINATION**

Environmental conditions and the nature and extent of contamination at Site 16 are described in detail in the RI Report issued in 2000 (HLA, 2000). Constituents detected in the surface soils (0 to 1 foot bls) include two volatile organic compounds (VOCs), 15 semi-volatile organic compounds (SVOCs), eight pesticides/PCBs, 23 inorganic constituents, and cyanide. Constituents detected in the subsurface soils (below 1 foot bls) include seven VOCs, 11 SVOCs, four pesticides, 21 inorganic constituents, and cyanide. Only the revised HHRA at Site 16 is discussed in the following sections.

## **2.2 SUMMARY OF THE REVISED HHRA**

This section presents the revised HHRA results using analytical data from surface and subsurface soils. The revised HHRA includes the changed conditions discussed in Section 1.0. The original HHRA was included in the RI Report (HLA, 2000).

The first step of the re-evaluation was to determine a revised list of COPCs. The re-evaluation considered exposure to surface soil by hypothetical future residents. FDEP SCTLs and USEPA Region III RBCs were used to select COPCs in the original risk assessment. However, USEPA Region IV currently requires the use of USEPA Region IX PRGs to select COPCs; therefore, FDEP SCTLs and USEPA's Region IX PRGs were used in this analysis to select COPCs for this evaluation.

As discussed in Section 1.0, arsenic, aluminum, iron, and vanadium are not considered COPCs for Site 16 surface or subsurface soils; thus, these inorganic constituents were not considered in the revised risk assessment. In addition, since the original risk assessment was prepared, the methodology for estimating risks resulting from dermal exposures to soil has changed. USEPA's Risk Assessment

Guidance for Superfund (RAGS), Part E dermal guidance, was used for the risk re-evaluation (USEPA, 2001).

The revised HHRA for Site 16 consisted of the following steps:

- Selection of COPCs
- Exposure assessment
- Toxicity assessment
- Risk characterization

The risk screening for human health uses the FDEP SCTLs (FDEP, 2005) and the USEPA Region IX PRGs (USEPA, 2004) to conservatively assess exposure and toxicity.

### **2.2.1 Selection of Human Health COPCs**

All soil samples collected at Site 16 (except for surface soil sample location 16S00601, excavated as part of the IRA in 2002) were evaluated for COPC selection. A comparison of the maximum detected surface and subsurface soil concentrations to screening levels based on USEPA Region IX PRGs and FDEP SCTLs for residential exposures was conducted.

#### **Surface Soils**

Twenty-six (26) soil samples collected from 0 to 1 foot bls at Site 16 were evaluated for surface soil COPC selection. The following constituents were detected in surface soils at maximum concentrations exceeding the direct contact, risk-based COPC screening levels and background and were retained as COPCs for surface soil at Site 16:

- carcinogenic polynuclear aromatic hydrocarbons (cPAHs)
- Pesticides/PCBs (Aroclor-1254, Aroclor-1260, and dieldrin)
- Inorganics (antimony, barium, cadmium, chromium, copper, lead, and mercury)

cPAH concentrations exceeded the simple apportioned and non-apportioned PRGs and SCTLs. Concentrations of Aroclor-1254, Aroclor-1260, and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. Concentrations of dieldrin exceeded the simple apportioned and non-apportioned PRGs and simple apportioned SCTL but were less than the non-apportioned SCTL. Concentrations of antimony exceeded the simple apportioned PRGs but were less than the non-apportioned PRGs and apportioned and non-apportioned SCTLs. Concentrations of barium and copper exceeded the simple apportioned and non-apportioned SCTLs but

were less than the apportioned and non-apportioned PRG. The maximum concentration of mercury exceeded the simple apportioned SCTL only.

### **Subsurface Soil**

All five soil samples collected from 2 to 10 feet bls at Site 16 were evaluated for subsurface soil COPC selection. The following constituents were detected in subsurface soils at maximum concentrations exceeding the direct contact, risk-based COPC screening levels and background concentrations, and they were retained as COPCs for subsurface soil at Site 16:

- cPAHs
- Inorganics (barium, cadmium, chromium, copper, and lead)

Concentrations of cPAHs and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. Concentrations of barium exceeded the simple apportioned and non-apportioned SCTLs but were less than the simple apportioned and non-apportioned PRGs. Concentrations of cadmium exceeded the simple apportioned PRG but were less than the non-apportioned PRGs and simple apportioned and non-apportioned SCTLs. Concentrations of copper exceeded the apportioned and non-apportioned PRGs and SCTLs. The maximum concentration of lead exceeded all COPC screening levels.

### **2.2.2 Risk Characterization Summary**

Potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) using USEPA and FDEP risk assessment guidance. The results are discussed below.

Four organics (cPAHs, Aroclor-1254, Aroclor-1260, and dieldrin) and seven inorganics (antimony, barium, cadmium, chromium, copper, lead, and mercury) were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. The cPAHs, barium, cadmium, chromium, copper, and lead were selected as COPCs for subsurface soil, and they also were evaluated according to USEPA guidelines. The non-cancer risk estimates [i.e., Hazard Index (HI)] did not exceed 1 for any of the receptors evaluated for exposure to surface or subsurface soils. Consequently, adverse, non-carcinogenic health effects are not anticipated. Although the cancer risk estimate developed for the COPCs for surface soil for one of the five receptors evaluated (hypothetical future resident) nominally exceeded the State of Florida cancer risk benchmark of  $1 \times 10^{-6}$ , none of the cancer risk estimates exceeded the USEPA cancer risk range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ . The primary risk drivers for surface soils were the cPAHs. The cancer risk estimate for a construction worker exposed to subsurface soils is  $2 \times 10^{-6}$  (primarily due to chromium); risk estimates for the resident and typical industrial worker exposed to

subsurface soils are less than  $1 \times 10^{-6}$ . The risk evaluation of lead concentrations detected in the Site 16 soils indicates exposure to the average lead concentration in the soils would not result in blood lead concentrations exceeding USEPA benchmarks.

The risk assessment conducted according to the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenario, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following constituents were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
cPAHs	None	None
Barium		
Copper		
Lead		

The maximum concentrations of cPAHs, barium, and copper exceeded their corresponding SCTLs. These constituents were identified as exceeding the Level 1 (residential) SCTLs and were retained as COCs for residential exposures to surface soil at Site 16. No COCs were identified in the Level 2 (industrial) evaluation for surface soil.

The following constituents were identified as potential COCs for subsurface soils based on a comparison of maximum detected concentrations to SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Barium	None	None
Copper		
Lead		

Maximum barium and copper concentrations in the subsurface soils exceeded their corresponding SCTLs. The maximum, but not the average, lead concentrations in the subsurface soils exceed the SCTL. These constituents exceeded the Level 1 (residential) SCTLs and were retained as COCs for residential exposures to subsurface soil at Site 16. No COCs were identified in the Level 2 (industrial) evaluation for subsurface soil.

### **2.2.3 Ecological Risk Assessment**

The ecological risk assessment (ERA) conducted at Site 16 was based on current USEPA methodology as detailed in *ERA for Superfund: Process for Designing and Conducting ERA* (USEPA, 2001). The objective of the ecological risk assessment was to re-evaluate and update the previous ecological risk evaluation for Site 16 presented in the 2000 RI report (HLA, 2000) and to assure compliance with current Navy, USEPA, and State of Florida guidance/methods.

A screening level ERA including Step 3A was completed for surface soil at Site 16. Following an initial screening step where maximum concentrations of site related contaminants were compared to conservative screening values (Friday, 1998), a list of COPCs was developed. Ecological soil guidelines were obtained from the same source document from which the USEPA Region IV screening values were developed. Ecological COPCs consisted of PAHs, pesticides, PCBs, and metals. Bioaccumulative COPCs were analyzed in a food chain model to evaluate potential risks associated with consumption of contaminated food. The results of the food chain model indicated potential risks were primarily limited to lead. The list of COPCs was refined through an evaluation of spatial distribution, frequency of detection and detection limits, receptor home range, constituent bioavailability, and background. The results of the refinement analyses indicated that based on spatial coverage and hazard quotients, lead and zinc contribute the most to site-related risk. The analyses further indicated that potential risk appears to be limited primarily to the vicinity of RI Phase IIB sampling locations 16S007 and 16S011. These locations contained elevated concentrations of multiple COPCs including lead and zinc.

### **2.2.4 Evaluation of Results**

#### **Non-carcinogenic Risk**

Cumulative HIs for exposures to surface and subsurface soil for all receptors were less than or equal to 1, indicating adverse, non-carcinogenic effects to humans are not anticipated under the conditions defined in the exposure assessment.

#### **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 the hypothetical future resident exposed to surface soils and the construction worker exposed to subsurface soils nominally exceeded the State of Florida's target risk level of  $1 \times 10^{-6}$ . For most receptors, the primary contributors to the cancer risk estimates for surface soils were cPAHs. The

chemical-specific ILCRs for chromium exceeded  $1 \times 10^{-6}$  for exposures to subsurface soil by construction workers ( $2 \times 10^{-6}$ ).

The HHRA was conducted for the constituents detected in 27 surface soil and 5 subsurface soil samples collected at Site 16. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors; the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user assuming exposure via the ingestion, dermal contact, and inhalation route of exposures. However, none of the receptors are currently contacting surface or subsurface soils at Site 16. The risk evaluations performed using USEPA guidelines, and State of Florida regulations and guidelines yielded comparable results.

The results of the ecological risk re-evaluation indicated that areas of potential risk to soil invertebrates and plants appear to be limited primarily to the vicinity of RI Phase IIB sampling locations 16S007 and 16S011 which contained elevated concentrations of lead and zinc.

### 3.0 REMEDIAL ACTION OBJECTIVES

The RAOs presented in the original FS for Site 16 were:

**RAO 1:** Reduce human health risks associated with exposure to surface soil containing contaminants greater than action levels.

**RAO 2:** Reduce ecological risks associated with exposure to surface soil containing contaminants greater than action levels.

**RAO 3:** Reduce risks to an excavation worker associated with exposure to subsurface soil containing contaminants greater than action levels.

The RAOs for this site were based on the following criteria:

- Unacceptable human health risk for direct exposure to surface soil based on the site specific cleanup goal for arsenic and residential SCTLs for PAHs.
- FDEP SCTLs (residential land use, 1999).
- USEPA Region III RBCs (residential land use).

Based on the changes discussed in Section 1.0 and current and potential future land use, the RAOs need to be revised for Site 16. The current and future anticipated use of the property at this site remains non-residential/recreational, and the current and future receptors are trespassers, recreational users, and maintenance workers.

Based on the current and future use receptors, two amended RAOs are applicable for Site 16.

**RAO 1:** Protect human health from carcinogenic risks associated with incidental ingestion of, inhalation of, and dermal contact with surface soil contaminated with cPAHs.

**RAO 2:** Protect human health from incidental ingestion of, inhalation of, and dermal contact with surface and subsurface soils containing elevated levels of barium, copper, and lead.

The new RAOs for this site are based on the following criteria:

- FDEP SCTLs (residential land use).
- USEPA Region IX PRGs (residential land use).

### **3.1 REVISED CLEANUP GOALS**

Cleanup Goals (CGs) establish acceptable exposure levels protective of human health and the environment. CGs are based on regulatory requirements, USEPA-acceptable risk levels, and assumptions regarding ultimate land uses as well as contaminant pathways. Specifically, CGs are used to estimate areas and volumes of impacted media and to set performance standards for potential remedial alternatives.

CGs are determined based on applicable and relevant or appropriate requirements (ARARs) and to be considered (TBC) criteria, constituents and media of interest, and exposure pathways. The CGs for this site are now formulated based on the following criteria: FDEP SCTLs for residential exposure [Chapter 62-777, Florida Administrative Code (F.A.C.)] (FDEP, 2005) and USEPA Region IX PRGs (USEPA, 2004). The future anticipated use of the site is for non-residential/non-recreational purposes; therefore, the exposure pathways are trespassers only.

The risk assessment results along with the FDEP SCTLs and USEPA Region IX PRGs for residential direct exposure were used to determine the CGs. Table 3-1 provides a list of the revised surface soil CGs for Site 16.

### **3.2 REVISED COCs**

A re-evaluation of the constituents remaining in surface and subsurface soil was conducted in the revised HHRA. The RI identified 12 COCs in surface soil and 8 in subsurface soil at Site 16. The revised HHRA identified four COCs (cPAHs, barium, copper, and lead) in surface soil and three (barium, copper, and lead) in subsurface soil at Site 16.

This was determined by comparing the soil CG value against the COPC's site-specific representative concentration (or maximum value if less than 10 samples). Any COPC with a site-specific representative concentration exceeding the CG becomes a COC. In summary, as shown in Table 3-2, there are four COCs for surface soil and three COCs for subsurface soil at Site 16.

**TABLE 3-1**  
**DETERMINATION OF REVISED CLEANUP GOALS AT SITE 16**  
**NAS WHITING FIELD**  
**MILTON, FLORIDA**

Constituent of Potential Concern <sup>1</sup>	Units	62-777, F.A.C. Residential SCTL <sup>2</sup>	USEPA Region IX Residential PRGs <sup>3</sup>	Lower Value	Risk Driver <sup>4</sup>	Surface Soil Background	Surface Soil CG	Subsurface Soil CG
cPAHs	mg/kg	0.1	0.062	0.062	C	NA	0.062	NA
Barium	mg/kg	120	5400	120	N	23.2	120	120
Copper	mg/kg	150	3100	150	N	9.4	150	150
Lead	mg/kg	400	400	400	N	11.4	400	400

Notes:

CG = cleanup goal  
 COPC = constituent of potential concern  
 cPAH = carcinogenic polynuclear aromatic hydrocarbons  
 F.A.C. = Florida Administrative Code  
 mg/kg = milligrams per kilogram  
 NA = not applicable  
 PRG = preliminary remediation goal  
 SCTL = soil cleanup target levels  
 USEPA = United States Environmental Protection Agency

<sup>1</sup>Combined list of all COPCs for Site 16.

<sup>2</sup>FDEP SCTLs for Chapter 62-777, F.A.C., 2005.

<sup>3</sup>USEPA Region IX PRG Table, 2002.  
 1/10<sup>th</sup> value used for non-carcinogens.

<sup>4</sup>Risk Driver Codes: N = Non-carcinogen, C = Carcinogen.

**TABLE 3-2**  
**REVISED CONSTITUENTS OF CONCERN EVALUATION**  
**SURFACE AND SUBSURFACE SOIL**  
**SITE 16**  
**NAS WHITING FIELD**  
**MILTON, FLORIDA**

Constituent of Potential Concern	Units	Maximum Detected Concentration	Maximum Qualifier	Representative Concentration <sup>1</sup>			CG	COC
				Value	Statistic <sup>2</sup>	Rationale <sup>3</sup>		
cPAHs	mg/kg	0.51	--	<b>0.51</b>	max	(1)	0.062	<b>yes</b>
Barium	mg/kg	257	--	<b>257</b>	max	(1)	120	<b>yes</b>
Copper	mg/kg	202	--	<b>202</b>	max	(1)	150	<b>yes</b>
Lead	mg/kg	759	--	<b>759</b>	max	(1)	400	<b>yes</b>

Notes:

cPAH = carcinogenic polynuclear aromatic hydrocarbons  
 CG = cleanup goal  
 COC = constituent of concern  
 max = maximum value used  
 mg/kg = milligrams per kilogram  
 UCL = upper confidence limit

<sup>1</sup>For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.

<sup>2</sup>Statistics: 95% UCL of log-transformed data (95% UCL-T), 95% UCL of data (95% UCL-N). Maximum value used (max).

<sup>3</sup>Rationale

(1) The 95% UCL exceeded the maximum; therefore, the maximum was used.

### **3.3 REVISED AREAS AND VOLUMES OF SOIL REQUIRING REMEDIAL ACTION**

The estimated area and volume of soil with COCs exceeding CGs at Site 16 has been revised from the original FS. Appendix C of the original FS presents area and volume calculations for Site 16 requiring remedial action under conditions at that time.

The area and volume of soil requiring remedial action based on current conditions at Site 16 has not changed for Remedial Alternatives 2 Land Use Controls ([LUCs] only) and 3 (soil cover and LUCs) as described in the original FS. For these alternatives, the area encompasses the areal extent of the site boundaries (Figure 2-1) as it did in the original FS. For Alternative 4 (limited soil removal - described in the original FS), the area has been revised due to the revisions discussed in Section 1.0, the revised list of COCs, and the IRA conducted in 2002. In the original FS, four (4) soil "Hot Spots" were proposed to be removed totaling an area of 3,200 square feet and a volume of 119 cubic yards. There are now only 3 surface soil "Hot Spots" that would need to be removed under this alternative totaling an area of 2,400 square feet and a volume of 89 cubic yards. These hot spots consist of a 20 feet by 20 feet area located around sample locations 16S007, 16S011, and 16S012 as shown on Figure 2-1. The vertical extent to be addressed for each of the alternatives at Site 16 remains the top 2 feet of soil where concentrations exceeding CGs remain.

In summary, the estimated area and volume of soil requiring remedial action or removal at Site 16 is approximately 507,600 square feet or 37,600 cubic yards for Remedial Alternatives 2 and 3 and 2,400 square feet or 89 cubic yards for Alternative 4.

## **4.0 AMENDED DESCRIPTION AND EVALUATION OF REMEDIAL ALTERNATIVES**

### **4.1 AMENDED DESCRIPTION OF ALTERNATIVES**

Identification and screening of appropriate remedial alternative technologies addressing the RAOs developed for Site 16 were presented in the FS. Each technology was then screened based on site and waste characteristics. Four soil remedial alternatives were developed in the original FS representing a range of options for Site 16 (HLA, 2001). This section of the FSA presents a revised description of the four original remedial alternatives. Table 4-1 shows a comparison between the soil remedial alternatives identified in the original FS and this FSA.

In the original FS (HLA, 2001), four alternatives were evaluated for Site 16 representing a range of actions including no action, limited action addressing principal threats, and an aggressive action minimizing the need for long-term management. The four alternatives providing a range of treatment options for Site 16 are listed below:

- Alternative S16-1: No Action
- Alternative S16-2: LUCs
- Alternative S16-3: Soil Cover and LUCs
- Alternative S16-4: Limited Soil Removal and LUCs

The four alternatives for Site 16 that will be re-evaluated in this FSA include No Further Action (NFA), LUCs, soil cover and LUCs, and limited soil removal with LUCs. The alternatives are described below:

#### **Alternative S16-1: NFA**

In an FS, the NFA alternative is considered to serve as a baseline consideration or to address sites not requiring any further active remediation. The NFA alternative for Site 16 assumes no further remedial action would occur and establishes a basis for comparison with the other alternatives. No remedial action, treatment, LUCs, or monitoring of conditions would be implemented under the NFA alternative.

#### **Alternative S16-2: LUCs [including Institutional Controls (IC) and Engineering Controls (ECs)]**

Alternative S16-2 addresses the principal threats through the implementation of LUCs for surface and subsurface soil. The LUCs for Site 16 would include ICs and ECs that would limit site access and exposure pathways at the site. ICs in the form of a non-residential or residential-like and non-recreational use prohibition and restrictions on activities which would disturb the site soil would be implemented to

**TABLE 4-1**  
**COMPARISON OF ORIGINAL FS AND FSA DESCRIPTION OF SOIL REMEDIAL ALTERNATIVES**  
**SITE 16, OPEN DISPOSAL AND BURNING AREA**  
**NAS WHITING FIELD**  
**MILTON, FLORIDA**

Alternative Number		Alternative Type		Representative Process Options Combined into Alternatives		Alternative Description	
FS (March 2001)	FSA <sup>(1)</sup>	FS (March 2001)	FSA	FS (March 2001)	FSA	FS (March 2001)	FSA
Alternative 1 No Action	Alternative 1 No Further Action	No Action	No Action	None	None	<ul style="list-style-type: none"> <li>No Action (w/ 5-year reviews)</li> </ul>	<ul style="list-style-type: none"> <li>No Action</li> </ul>
Alternative 2 LUCs	Alternative 2 LUCs	Limited Action – No or Minimal Treatment	Limited Action – No or Minimal Treatment	LUCs	LUCs	<ul style="list-style-type: none"> <li>LUCs including LUCAP and LUCIP</li> <li>Posting of warning signs</li> <li>Five-year site reviews</li> </ul>	<ul style="list-style-type: none"> <li>LUCs (LUC RD)</li> <li>Posting of warning signs</li> <li>(Five-year reviews will be required)</li> </ul>
Alternative 3 Soil Cover and LUCs	Alternative 3 Soil Cover and LUCs	Containment – No or Minimal Treatment	Containment – No or Minimal Treatment	Soil Cover and LUCs	Soil Cover and LUCs	<ul style="list-style-type: none"> <li>LUCs including LUCAP and LUCIP</li> <li>Construction of soil cover over surface soil exceeding PRGs</li> <li>Establish vegetative cover</li> <li>Posting of warning signs</li> <li>Five-year site reviews</li> </ul>	<ul style="list-style-type: none"> <li>LUCs (LUC RD), including maintenance of soil cover</li> <li>Construction of soil cover over surface soil exceeding CGs</li> <li>Establish vegetative cover</li> <li>Posting of warning signs</li> <li>(Five-year reviews will be required)</li> </ul>
Alternative 4 Limited Soil (exceeding PRGs) Removal and LUCs	Alternative 4 Limited Soil (exceeding CGs) Removal and LUCs	Treatment/Bulk Removal – Minimizes Long-Term Management	Treatment/Bulk Removal – Minimizes Long-Term Management	Excavation, Disposal, and LUCs	Excavation, Disposal, and LUCs	<ul style="list-style-type: none"> <li>LUCs including LUCAP and LUCIP</li> <li>Excavation/disposal of soil exceeding PRGs</li> <li>Backfill excavations with clean fill</li> <li>Establish vegetative cover</li> <li>Posting of warning signs</li> <li>Five-year site reviews</li> </ul>	<ul style="list-style-type: none"> <li>LUCs (LUC RD)</li> <li>Excavation/disposal of soils exceeding CGs</li> <li>Backfill excavations with clean fill</li> <li>Establish vegetative cover</li> <li>Posting of warning signs</li> <li>(Five-year reviews will be required)</li> </ul>

Notes:

FS = Feasibility Study

FSA = Feasibility Study Addendum

LUCs = Land Use Controls

PRGs = Preliminary Remediation Goals (site specific goal as defined in the FS; Similar to the CG in the FSA).

LUCIP = LUC Implementation Plan (changed to RD in FSA)

LUCAP = LUC Assurance Plan (changed to RD in FSA)

CGs = Cleanup Goals

RD = Remedial Design

<sup>(1)</sup> The FSA was required due to changes in risk assessment methodology and regulatory criteria (since 2001) which necessitated a re-evaluation of site data and re-examination of the proposed remedial alternatives.

ensure appropriate future land use. ECs at Site 16 would also limit exposure pathways at the site by implementing the use of posted signage or other controls to ensure future land use.

The application of LUCs and the containment of wastes at Site 16 would be consistent with USEPA's Presumptive Remedy Guidance for military landfill sites.

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

Alternative S16-3 provides containment of all surface soils containing COCs exceeding CGs. The soil cover would be constructed over the entire site and includes the former disposal areas. The soil cover would consist of clean fill placed and compacted to minimum thickness of 18 inches, and then 6 inches of top soil would be placed on top of the clean fill for a total cover thickness of 24 inches.

Post-Remedial Action monitoring and maintenance of the installed soil cover would be implemented. This program would include visual inspections and maintenance of the cover. LUCs (including the use of posted signage or other containment barriers) would be implemented to ensure the anticipated or appropriate future land use and assess the need for continued soil cover monitoring.

#### **Alternative S16-4: Limited Soil Removal and LUCs**

Alternative S16-4 provides a disposal option by combining limited "Hot Spot" soil removal with all the components of Alternative 2 (LUCs). "Hot Spot" soil excavation would be used to remove impacted surface soils at three (3) areas with levels of cPAHs and lead exceeding CGs. The excavations would consist of removing the contaminated soil from a 20 feet by 20 feet area and down 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 excavated area would be backfilled with 2 feet of clean, native material, compacted, and revegetated. Disposal in an approved off-base Treatment, Storage, and Disposal Facility (TSDF) and/or landfill would be used for the excavated soil from Site 16.

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

## **4.2 AMENDED EVALUATION OF ALTERNATIVES**

This section compares the impact of the changes in surface soil COCs on the evaluation of the four remedial alternatives in accordance with the nine CERCLA criteria, as originally provided in the FS. A summary of this comparison is provided in Table 4-2.

#### **4.2.1 Overall Protection of Human Health and the Environment**

The changes discussed in Section 1.0 and the revised COCs, as determined by the revised HHRA for Site 16, do not result in a change in the relative overall protection of human health and the environment provided by Alternatives 1, 2, 3, or 4. Alternative 1 remains unprotective of human health and the environment. Alternatives 2, 3, and 4 remain protective of human health and the environment.

#### **4.2.2 Compliance with ARARs**

The changes do not impact the compliance of Alternative 1, 2, 3, or 4 with ARARs. There is no change in the compliance of Alternatives 1, 2, 3, and 4 with chemical-, location-, and action-specific ARARs.

#### **4.2.3 Long-Term Effectiveness and Permanence**

The changes do not impact the long-term effectiveness and permanence of Alternative 1 but do impact Alternatives 2, 3, and 4. Alternative 1 will not provide long-term effectiveness and permanence, and Alternatives 2, 3, and 4 will continue to provide long-term effectiveness and permanence, but the residual risk has decreased due to the reduction of COCs at the site.

#### **4.2.4 Reduction of Mobility, Toxicity, or Volume through Treatment**

The changes do not impact Alternative 1. Alternative 1 does not provide reduction of mobility, toxicity, or volume because there is no action. The reduced list of COCs slightly impacts the reduction of mobility, toxicity, or volume provided by Alternatives 2, 3, and 4 because the type and quantity of residuals remaining on site has been reduced.

#### **4.2.5 Short-Term Effectiveness**

The changes do not impact Alternative 1. Alternative 1 will not provide short-term effectiveness because there is no action. Alternatives 2, 3, and 4 would still provide short-term effectiveness.

**TABLE 4-2  
SUMMARY OF COMPARATIVE IMPACT OF CHANGES IN COCs ON EVALUATION OF REMEDIAL ALTERNATIVES  
SITE 16, OPEN DISPOSAL AND BURNING AREA - FS ADDENDUM  
NAS WHITING FIELD  
MILTON, FLORIDA  
PAGE 1 OF 2**

<b>CRITERIA</b>	<b>ALTERNATIVE 1 NFA</b>	<b>ALTERNATIVE 2 LUCs</b>	<b>ALTERNATIVE 3 Soil Cover and LUCs</b>	<b>ALTERNATIVE 4 Limited Soil Removal and LUCs</b>
<b>THRESHOLD CRITERIA</b>				
<b>Overall Protection of Human Health and the Environment</b>				
Human Health Protection	No change	No change	No change	No change
Environmental Protection	No change	No change	No change	No change
<b>Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)</b>				
Compliance with Chemical-Specific ARARs	No change	No change	No change	No change
Compliance with Action-Specific ARARs	No change	No change	No change	No change
Compliance with Location-Specific ARARs	No change	No change	No change	No change
Compliance with Other Criteria	No change	No change	No change	No change
<b>BALANCING CRITERIA</b>				
<b>Long-Term Effectiveness and Permanence</b>				
Reduction in Residual Risk	No change	Decreased risk due to reduction of COCs	Decreased risk due to reduction of COCs	Decreased risk due to reduction of COCs
Long-Term Reliability of Controls	No change	No change	No change	No change
Need for 5-Year Review	Not required	No change	No change	No change
Prevention of Exposure to Residuals	No change	No change	No change	No change
Potential Need for Replacement of Technical Components after Remedial Objectives Are Achieved	No change	No change	No change	No change
Long-Term Management	No change	No change	No change	No change
<b>Reduction of Mobility, Toxicity, or Volume through Treatment</b>				
Amount Destroyed or Treated	No change	No change	No change	No change
Reduction in Mobility, Toxicity, or Volume	No change	No change	No change	No change
Irreversibility of Treatment	No change	No change	No change	No change
Type and Quantity of Residuals Remaining after Treatment	No change	Decreased due to reduction of COCs	Decreased due to reduction of COCs	Decreased due to reduction of COCs

**TABLE 4-2  
SUMMARY OF COMPARATIVE IMPACT OF CHANGES IN COCs ON EVALUATION OF REMEDIAL ALTERNATIVES  
SITE 16, OPEN DISPOSAL AND BURNING AREA - FS ADDENDUM  
NAS WHITING FIELD  
MILTON, FLORIDA  
PAGE 2 OF 2**

<b>CRITERIA</b>	<b>ALTERNATIVE 1 NFA</b>	<b>ALTERNATIVE 2 LUCs</b>	<b>ALTERNATIVE 3 Soil Cover and LUCs</b>	<b>ALTERNATIVE 4 Limited Soil Removal and LUCS</b>
<b>Short-Term Effectiveness</b>				
Community Protection During Implementation	No change	No change	No change	No change
Worker Protection During Implementation	No change	No change	No change	No change
Environmental Impacts	No change	No change	No change	No change
Construction Time	No change	No change	No change	No change
Time Until RAOs and CGs are Achieved	No change	No change	No change	No change
<b>Implementability</b>				
Ability to Construct and Operate the Technology	No change	No change	No change	No change
Reliability of Technology	No change	No change	No change	No change
Ease of Undertaking Additional Remedial Action, if Required	No change	No change	No change	No change
Ability to Monitor Effectiveness	No change	No change	No change	No change
Permitting Requirements	No change	No change	No change	No change
Coordination with Other Agencies	No change	No change	No change	No change
Availability of Services and Capabilities	No change	No change	No change	No change
Availability of Equipment, Specialists, and Materials	No change	No change	No change	No change
<b>Cost<sup>a</sup></b>				
Capital Costs	No change	\$32,134 (decrease)	\$49,335 (decrease)	\$23,628 (decrease)
Short-Term O&M	No change	No change	No change	No change
Long-Term O&M				
5-Year Review	a	No change	No change	No change
Land-Use Controls	No change	No change	No change	No change
Total Project Present Worth Cost (30 year timeframe)	No change \$0 (Total)	\$32,134 (decrease) \$102,954 (Total)	\$291,576 (decrease) \$1,002,870 (Total)	\$23,628 (decrease) \$177,558 (Total)
<b>State Acceptance</b>				
FDEP Review and Comment	No change	No change	No change	No change
<b>Community Acceptance</b>				
Public Review and Comment	No change	No change	No change	No change

NOTES:

ARAR = applicable or relevant and appropriate requirement  
COC = constituent of concern  
LUC = land use control  
RAO = remedial action objective

NFA = no further action  
O&M = operation and maintenance  
FDEP = Florida Department of Environmental Protection  
CG = cleanup goals

<sup>a</sup>The original FS included costs for 5 year review; however, the 5-year reviews are not included for the No Action Alternative in this re-evaluation a 5-year reviews are not required for NFAs.

#### **4.2.6 Implementability**

The changes have no impact on the implementability of any of the four alternatives.

#### **4.2.7 Cost**

The changes do have an impact on the costs for Alternatives 2, 3, and 4 resulting in a reduction in costs from the original FS cost estimates for these alternatives. The decrease in costs is not significant for Alternatives 2 and 3 and is a result of restructuring the estimates and recalculating many of the line items. The cost reduction for Alternative 4 is a direct result of the decrease in COCs and the IRA conducted in 2002 which reduced the number of "Hot Spots" and thus the area to address via excavation. Table 4-2 presents the revised costs for Alternatives 2, 3, and 4. The net present worth (NPW) cost estimates for Alternatives 2, 3, and 4 are detailed in Appendix A. There would be no cost for Alternative 1.

#### **4.2.8 State Acceptance**

The FDEP will review and comment on the Draft FSA for Site 16 prior to final approval and subsequent acceptance.

#### **4.2.9 Community Acceptance**

The information concerning community acceptance will be addressed following public comment on the Proposed Plan for Site 16 in the responsiveness summary to be included in the Record of Decision for Site 16.

### **4.3 EVALUATION SUMMARY**

As discussed in the above sections and further illustrated in Table 4-2, recent regulatory revisions and supplemental investigative findings at Site 16 have had some impact on the findings of the original FS, particularly the cost decrease to implement Alternatives 2, 3, and 4 for Site 16. The remedial alternatives and their comparative evaluation as presented in this FSA are slightly different from those presented in the original FS.

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## **APPENDIX A**

### **REMEDIAL ALTERNATIVE COST ESTIMATES**

NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16  
SOIL ALTERNATIVE 2: LAND USE CONTROLS  
CAPITAL COSTS

Cost Item	Quantity	Unit	Subcontract	Unit Cost			Subcontract	Extended Cost			Subtotal
				Material	Labor	Equipment		Material	Labor	Equipment	
<b>1 PROJECT PLANNING</b>											
1.1 Prepare Remedial Design (Engineer)	40	hr			\$26.44		\$0	\$0	\$1,058	\$0	\$1,058
1.2 Project Scheduling and Procurement (Project Manager)	8	hr			\$40.12		\$0	\$0	\$321	\$0	\$321
<b>2 MOBILIZATION/DEMobilIZATION</b>											
2.1 Equipment Mob/Demob (Exc. & Dozier)	0	ea			\$200.00	\$250.00	\$0	\$0	\$0	\$0	\$0
2.2 Mobilize/Demobilize Personnel (2-persons)	0	ea		\$375.00	\$300.00		\$0	\$0	\$0	\$0	\$0
<b>3 DECONTAMINATION</b>											
3.1 Temporary Decon Pad	0	ls		\$250.00	\$200.00	\$75.00	\$0	\$0	\$0	\$0	\$0
3.2 Decon Water Disposal	0	drum	\$125.00				\$0	\$0	\$0	\$0	\$0
3.3 Decon Water Storage Drums	0	ea		\$45.00			\$0	\$0	\$0	\$0	\$0
3.4 PPE (2 p * 2 days)	0	m-day		\$30.00			\$0	\$0	\$0	\$0	\$0
3.5 Decontaminate Equipment (Pressure Washer)	0	ea			\$134.45	\$50.00	\$0	\$0	\$0	\$0	\$0
<b>4 SITE PREPARATION</b>											
4.1 Erosion Control Fencing	0	lf		\$0.23	\$1.17		\$0	\$0	\$0	\$0	\$0
4.2 Collect/Analyze Delineation Samples	0	ea	\$200.00	\$10.00	\$22.24		\$0	\$0	\$0	\$0	\$0
4.3 Construction Surveys (2-man crew)	0	day	\$648.36				\$0	\$0	\$0	\$0	\$0
4.4 Utility Location and Site Delineation/Layout	0	hrs			\$26.44		\$0	\$0	\$0	\$0	\$0
<b>5 EXCAVATION/BACKFILL</b>											
5.1 Excavate/Load Contaminated Soil (1.0 cy Hyd. Excavator)	0.00	cy			\$1.27	\$2.23	\$0	\$0	\$0	\$0	\$0
5.2 Standby, Crawler Mounted 1.0 CY Hydraulic Excavator	0	hrs				\$20.50	\$0	\$0	\$0	\$0	\$0
5.3 Health & Safety Monitoring with OVA during Excavation	0	day			\$188.16	\$100.00	\$0	\$0	\$0	\$0	\$0
5.4 Collect/Analyze Confirmatory Samples	0	ea	\$200.00	\$10.00	\$22.24		\$0	\$0	\$0	\$0	\$0
5.5 Import (Offsite) Place, Compact Clean Fill Material	0.00	cy		\$7.82	\$0.85	\$1.81	\$0	\$0	\$0	\$0	\$0
5.6 UST Removal	0	ea		\$340.72	\$485.04	\$1,638.12	\$0	\$0	\$0	\$0	\$0
<b>6 OFF-SITE TRANSPORTATION/DISPOSAL</b>											
6.1 Waste Profile	0	ls	\$750.00				\$0	\$0	\$0	\$0	\$0
6.2 Transport and Dispose of Soil (Non-hazard.) in Landfill	0.00	ton	\$45.00				\$0	\$0	\$0	\$0	\$0
6.3 Prepare Shipment Manifests	0	hrs			\$26.44		\$0	\$0	\$0	\$0	\$0
<b>7 SITE RESTORATION</b>											
7.1 Import Vegetative Cover Material (Topsoil)	0.00	cy		\$15.00			\$0	\$0	\$0	\$0	\$0
7.2 Place/Grade Topsoil (6")	0	day			\$227.20	\$435.00	\$0	\$0	\$0	\$0	\$0
7.3 Sod Disturbed Area	0.0	acre					\$0	\$0	\$0	\$0	\$0
7.4 Warning Signs	6.0	ls	\$50.00	\$25.00			\$300	\$150	\$0	\$0	\$450
<b>8 LAND USE CONTROLS</b>											
8.1 Site Survey (2-man crew)	2	days	\$700.00				\$1,400	\$0	\$0	\$0	\$1,400
8.2 Survey Plat	1	ls	\$2,600.00				\$2,600	\$0	\$0	\$0	\$2,600
8.3 Prepare Land Use Control Implementation Plan/Docs (Engineer)	100	hours			\$26.44		\$0	\$0	\$2,644	\$0	\$2,644
8.4 Modify Master Plan and Prepare Deed Restrictions (Eng/PM)	80	hours			\$40.12		\$0	\$0	\$3,210	\$0	\$3,210
<b>Subtotal Direct Capital Costs less Subcontract</b>								\$150	\$7,232	\$0	\$7,382
<b>Local Area Adjustment</b>								84%	84%	84%	
								\$126	\$6,075	\$0	\$6,201
Overhead on Labor Cost @ 30%									\$1,823		\$1,823
G & A on Labor Cost @ 10%									\$608		\$608
G & A on Material Cost @ 10%								\$13			\$13
<b>Total Direct Capital Cost</b>								\$139	\$8,505	\$0	\$8,644

**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**  
**SITE 16**  
**SOIL ALTERNATIVE 2: LAND USE CONTROLS**  
**CAPITAL COSTS**

Cost Item	Quantity	Unit	Subcontract	Unit Cost			Subcontract	Extended Cost			Subtotal	
				Material	Labor	Equipment		Material	Labor	Equipment		
Indirects on Total Direct Labor Cost @ 75%											\$6,379	\$6,379
Profit on Total Direct Cost @ 10%												\$864
<b>Subtotal</b>												<b>\$15,887</b>
Health & Safety Monitoring @ 3%			(Includes Subcontractor cost)									\$606
<b>Total Field Cost</b>												<b>\$16,492</b>
Subtotal Subcontractor Cost							\$4,300					\$4,300
G & A on Subcontract Cost @ 10%							\$430					\$430
Profit on Subcontractor Cost @ 5%												\$215
<b>Subcontractor Cost</b>												<b>\$4,945</b>
Contingency on Total Field and Subcontractor Costs @ 10%												\$2,144
Engineering on Total Field and Subcontractor Costs @ 5%												\$1,072
<b>TOTAL Capital COST</b>												<b>\$24,653</b>

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16  
SOIL ALTERNATIVE 2: LAND USE CONTROLS  
ANNUAL COSTS**

Cost Item	Quantity	Unit	Unit Cost	Labor Overhead <sup>a</sup>	Total Cost
<b>1 FIVE YEAR SITE REVIEWS (FOR 30 YEAR PERIOD)</b>					
1.1 Site Review Meeting (2-persons for 2-days)					
Project Manager	16	hr	\$40.12	\$40.12	\$1,284
Staff Engineer	16	hr	\$26.44	\$26.44	\$846
ODCs (travel, etc.)	1	ls	\$400.00		\$400
1.2 Five Year Review Report					
Project Manager	8	hr	\$40.12	\$40.12	\$642
Staff Engineer	32	hr	\$26.44	\$26.44	\$1,692
ODCs (photocopies, telephone, etc.)	1	ls	\$250.00		\$250
Subtotal Five Year Review Cost					\$5,114
G&A and Profit @ 15%					\$767
Subtotal					\$5,881
Contingency @ 10%					\$588.11
<b>Total Five Year Review Cost</b>					<b>\$6,469</b>
<b>2 LAND USE CONTROL MONITORING (FOR 30 YEAR PERIOD)</b>					
2.1 Quarterly Site Inspections					
Project Manager (2 hrs for each inspection)	8	hr	\$40.12	\$40.12	\$642
Staff Engineer	32	hr	\$26.44	\$26.44	\$1,692
2.2 Annual Review and Report					
Project Manager	4	hr	\$40.12	\$40.12	\$321
Staff Engineer	12	hr	\$26.44	\$26.44	\$635
ODCs (photocopies, telephone, etc.)	1	ls	\$250.00		\$250
2.3 Sign/Fence Maintenance					
	1	ls	\$50.00		\$50
Subtotal Land Use Control Monitoring					\$3,590
G&A and Profit @ 15%					\$538
Subtotal					\$4,128
Contingency @ 10%					\$412.80
<b>Total Land Use Control Monitoring Cost</b>					<b>\$4,541</b>

<sup>a</sup> Overhead on professional labor @ 100%.

**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**  
**SITE 16**  
**SOIL ALTERNATIVE 2: LAND USE CONTROLS**  
**PRESENT WORTH ANALYSIS**

Year	Capital Cost	Operation and Maintenance Cost	Annual Cost	Total Yearly Cost	Present-Worth Factor (i = 6%)	Present Worth
0	\$24,653			\$24,653	1.000	\$24,653
1		\$0	\$4,541	\$4,541	0.943	\$4,284
2		\$0	\$4,541	\$4,541	0.890	\$4,041
3		\$0	\$4,541	\$4,541	0.840	\$3,813
4		\$0	\$4,541	\$4,541	0.792	\$3,597
5		\$0	\$11,010	\$11,010	0.747	\$8,227
6		\$0	\$4,541	\$4,541	0.705	\$3,201
7		\$0	\$4,541	\$4,541	0.665	\$3,020
8		\$0	\$4,541	\$4,541	0.627	\$2,849
9		\$0	\$4,541	\$4,541	0.592	\$2,688
10		\$0	\$11,010	\$11,010	0.558	\$6,148
11		\$0	\$4,541	\$4,541	0.527	\$2,392
12		\$0	\$4,541	\$4,541	0.497	\$2,257
13		\$0	\$4,541	\$4,541	0.469	\$2,129
14		\$0	\$4,541	\$4,541	0.442	\$2,008
15		\$0	\$11,010	\$11,010	0.417	\$4,594
16		\$0	\$4,541	\$4,541	0.394	\$1,787
17		\$0	\$4,541	\$4,541	0.371	\$1,686
18		\$0	\$4,541	\$4,541	0.350	\$1,591
19		\$0	\$4,541	\$4,541	0.331	\$1,501
20		\$0	\$11,010	\$11,010	0.312	\$3,433
21		\$0	\$4,541	\$4,541	0.294	\$1,336
22		\$0	\$4,541	\$4,541	0.278	\$1,260
23		\$0	\$4,541	\$4,541	0.262	\$1,189
24		\$0	\$4,541	\$4,541	0.247	\$1,121
25		\$0	\$11,010	\$11,010	0.233	\$2,565
26		\$0	\$4,541	\$4,541	0.220	\$998
27		\$0	\$4,541	\$4,541	0.207	\$942
28		\$0	\$4,541	\$4,541	0.196	\$888
29		\$0	\$4,541	\$4,541	0.185	\$838
30		\$0	\$11,010	\$11,010	0.174	\$1,917
<b>TOTAL PRESENT WORTH</b>						<b>\$102,954</b>

NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16  
SOIL ALTERNATIVE 3: SOIL COVER AND LUCs  
CAPITAL COSTS

Cost Item	Quantity	Unit	Subcontract	Unit Cost			Subcontract	Extended Cost			Subtotal
				Material	Labor	Equipment		Material	Labor	Equipment	
<b>1 PROJECT PLANNING</b>											
1.1 Prepare Remedial Design (Engineer)	120	hr			\$26.44		\$0	\$0	\$3,173	\$0	\$3,173
1.2 Project Scheduling and Procurement (Project Manager/TE)	40	hr			\$40.12		\$0	\$0	\$1,605	\$0	\$1,605
<b>2 MOBILIZATION/DEMobilIZATION</b>											
2.1 Equipment Mob/Demob (Exc., Loader, & Dozier)	2	ea			\$400.00	\$600.00	\$0	\$0	\$800	\$1,200	\$2,000
2.2 Mobilize/Demobilize Personnel (3-persons)	2	ea		\$400.00	\$350.00		\$0	\$800	\$700	\$0	\$1,500
2.3 Portable Toilet	1	mo	\$74.18				\$74	\$0	\$0	\$0	\$74
2.4 Storage Trailer (28' x 10')	1	mo	\$98.33				\$98	\$0	\$0	\$0	\$98
2.5 Office Trailer (32' x 8')	0	mo	\$221.49				\$0	\$0	\$0	\$0	\$0
2.6 Site Utilities	0	mo	\$1,500.00				\$0	\$0	\$0	\$0	\$0
<b>3 DECONTAMINATION</b>											
3.1 Temporary Decon Pad	1	ls		\$450.00	\$400.00	\$155.00	\$0	\$450	\$400	\$155	\$1,005
3.2 Decon Water Disposal	5	drum	\$150.00				\$750	\$0	\$0	\$0	\$750
3.3 Decon Water Storage Drums	5	ea		\$45.00			\$0	\$225	\$0	\$0	\$225
3.4 PPE (3 p * 5 days * 1 Weeks)	15	m-day		\$30.00			\$0	\$450	\$0	\$0	\$450
3.5 Decontaminate Equipment (Pressure Washer)	2	ea			\$134.45	\$50.00	\$0	\$0	\$269	\$100	\$369
<b>4 SITE PREPARATION</b>											
4.1 Erosion Control Fencing	3200	lf		\$5.00			\$0	\$16,000	\$0	\$0	\$16,000
4.2 Signs	16	ea	\$75.00				\$1,200	\$0	\$0	\$0	\$1,200
4.3 Construction Surveys (2-man crew)	2	day	\$648.36				\$1,297	\$0	\$0	\$0	\$1,297
4.4 Utility Location and Site Delineation/Layout	2	hrs				\$33.23	\$0	\$0	\$66	\$0	\$66
4.5 Backhoe and Operator	5	day	\$1,500.00				\$7,500	\$0	\$0	\$0	\$7,500
4.6 Frontend Loader and Operator	5	day	\$900.00				\$4,500	\$0	\$0	\$0	\$4,500
4.7 Concrete Debris Disposal	0	cy	\$20.70				\$0	\$0	\$0	\$0	\$0
<b>5 EXCAVATION/BACKFILL</b>											
5.1 Excavate/Load Contaminated Soil (2.0 cy Hyd. Exc.)	0	cy			\$0.68	\$1.71	\$0	\$0	\$0	\$0	\$0
5.2 Standby, Crawler Mounted 2.0 CY Hydraulic Excavator	0	hrs				\$37.54	\$0	\$0	\$0	\$0	\$0
5.3 Wheel Loader, 3 cy	0	hrs			\$27.20	\$56.31	\$0	\$0	\$0	\$0	\$0
5.4 Standby, Wheel Loader, 3 cy	0	hrs				\$14.07	\$0	\$0	\$0	\$0	\$0
5.5 Health & Safety Monitoring with OVA during Construction	5	day			\$188.16	\$100.00	\$0	\$0	\$941	\$500	\$1,441
5.6 Collect/Analyze Confirmatory Samples	0	ea	\$200.00	\$10.00	\$23.52		\$0	\$0	\$0	\$0	\$0
5.7 Import (Offsite) Place, Compact Clean Fill Material	0	cy		\$12.00	\$0.85	\$1.81	\$0	\$0	\$0	\$0	\$0
5.8 Backfill with Clean Excavated Material	0	cy		\$0.28	\$2.02	\$0.76	\$0	\$0	\$0	\$0	\$0
5.9 Site Foreman/FOL	40	hrs			\$65.00		\$0	\$0	\$2,600	\$0	\$2,600
<b>6 OFF-SITE TRANSPORTATION/DISPOSAL</b>											
6.1 Waste Profile	0	ls	\$750.00				\$0	\$0	\$0	\$0	\$0
6.2 Transport and Dispose of Soil (Non-haz.) in Landfill	0	ton	\$45.00				\$0	\$0	\$0	\$0	\$0
6.3 Prepare Shipment Manifests	0	hrs				\$33.23	\$0	\$0	\$0	\$0	\$0
<b>7 SITE RESTORATION</b>											
7.1 Soil Cover (clean fill - spread and compaction)	33840	cy	\$12.00				\$406,080	\$0	\$0	\$0	\$406,080
7.2 Top soil (haul and spread)	11280	cy	\$16.00				\$180,480	\$0	\$0	\$0	\$180,480
7.3 Fertilize, seed, mulch	12	acre		\$2,500.00				\$30,000	\$0	\$0	\$30,000
<b>8 LAND USE CONTROLS</b>											
8.1 Site Survey (2-man crew)	2	days	\$700.00				\$1,400	\$0	\$0	\$0	\$1,400
8.2 Survey Plat	1	ls	\$2,700.00				\$2,700	\$0	\$0	\$0	\$2,700
8.3 Prepare Land Use Control Implementation Plan/Docs (Eng)	100	hours			\$26.44		\$0	\$0	\$2,644	\$0	\$2,644
8.4 Modify Master Plan and Prepare Deed Restrictions (Eng/F)	80	hours			\$40.12		\$0	\$0	\$3,210	\$0	\$3,210
<b>Subtotal Direct Capital Costs less Subcontract</b>								\$47,925	\$16,407	\$1,955	\$66,287

**NAVAL AIR STATION WHITING FIELD**  
**MILTON, FLORIDA**  
**SITE 16**  
**SOIL ALTERNATIVE 3: SOIL COVER AND LUCs**  
**CAPITAL COSTS**

Cost Item	Quantity	Unit	Subcontract	Unit Cost			Subcontract	Extended Cost			Subtotal
				Material	Labor	Equipment		Material	Labor	Equipment	
<b>Local Area Adjustment</b>								84%	84%	84%	
								\$40,257	\$13,782	\$1,642	\$55,681
Overhead on Labor Cost @ 30%									\$4,135		\$4,135
G & A on Labor Cost @ 10%									\$1,378		\$1,378
G & A on Material Cost @ 10%								\$4,026			\$4,026
<b>Total Direct Capital Cost</b>								\$44,283	\$19,295	\$1,642	\$65,220
Indirects on Total Direct Labor Cost @ 75%									\$14,471		\$14,471
Profit on Total Direct Cost @ 10%											\$6,522
<b>Subtotal</b>											\$86,213
Health & Safety Monitoring @ 3%			(Includes Subcontractor cost)								\$20,769
<b>Total Field Cost</b>											\$106,982
Subtotal Subcontractor Cost							\$606,079				\$606,079
G & A on Subcontract Cost @ 10%							\$60,608				\$60,608
Profit on Subcontractor Cost @ 5%											\$30,304
<b>Subcontractor Cost</b>											\$696,991
Contingency on Total Field and Subcontractor Costs @ 10%											\$80,397
Engineering on Total Field and Subcontractor Costs @ 5%											\$40,199
<b>TOTAL Capital COST</b>											\$924,569

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16  
SOIL ALTERNATIVE 3: SOIL COVER AND LUCs  
ANNUAL COSTS**

Cost Item	Quantity	Unit	Unit Cost	Labor Overhead <sup>a</sup>	Total Cost
<b>1 FIVE YEAR SITE REVIEWS (FOR 30 YEAR PERIOD)</b>					
1.1 Site Review Meeting (2-persons for 2-days)					
Project Manager	16	hr	\$40.12	\$40.12	\$1,284
Staff Engineer	16	hr	\$26.44	\$26.44	\$846
ODCs (travel, etc.)	1	ls	\$400.00		\$400
1.2 Five Year Review Report					
Project Manager	8	hr	\$40.12	\$40.12	\$642
Staff Engineer	32	hr	\$26.44	\$26.44	\$1,692
ODCs (photocopies, telephone, etc.)	1	ls	\$250.00		\$250
Subtotal Five Year Review Cost					\$5,114
G&A and Profit @ 15%					\$767
Subtotal					\$5,881
Contingency @ 10%					\$588.11
<b>Total Five Year Review Cost</b>					<b>\$6,469</b>
<b>2 LAND USE CONTROL MONITORING (FOR 30 YEAR PERIOD)</b>					
2.1 Quarterly Site Inspections					
Project Manager (2 hrs for each Inspection)	8	hr	\$40.12	\$40.12	\$642
Staff Engineer	32	hr	\$26.44	\$26.44	\$1,692
2.2 Annual Review and Report					
Project Manager	4	hr	\$40.12	\$40.12	\$321
Staff Engineer	12	hr	\$26.44	\$26.44	\$635
ODCs (photocopies, telephone, etc.)	1	ls	\$250.00		\$250
2.3 Sign/Fence Maintenance					
	1	ls	\$50.00		\$50
Subtotal Land Use Control Monitoring					\$3,590
G&A and Profit @ 15%					\$538
Subtotal					\$4,128
Contingency @ 10%					\$412.80
<b>Total Land Use Control Monitoring Cost</b>					<b>\$4,541</b>

<sup>a</sup> Overhead on professional labor @ 100%.

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16  
SOIL ALTERNATIVE 3: SOIL COVER AND LUCs  
PRESENT WORTH ANALYSIS**

Year	Capital Cost	Operation and Maintenance Cost	Annual Cost	Total Yearly Cost	Present-Worth Factor (i = 6%)	Present Worth
0	\$924,569			\$924,569	1.000	\$924,569
1		\$0	\$4,541	\$4,541	0.943	\$4,284
2		\$0	\$4,541	\$4,541	0.890	\$4,041
3		\$0	\$4,541	\$4,541	0.840	\$3,813
4		\$0	\$4,541	\$4,541	0.792	\$3,597
5		\$0	\$11,010	\$11,010	0.747	\$8,227
6		\$0	\$4,541	\$4,541	0.705	\$3,201
7		\$0	\$4,541	\$4,541	0.665	\$3,020
8		\$0	\$4,541	\$4,541	0.627	\$2,849
9		\$0	\$4,541	\$4,541	0.592	\$2,688
10		\$0	\$11,010	\$11,010	0.558	\$6,148
11		\$0	\$4,541	\$4,541	0.527	\$2,392
12		\$0	\$4,541	\$4,541	0.497	\$2,257
13		\$0	\$4,541	\$4,541	0.469	\$2,129
14		\$0	\$4,541	\$4,541	0.442	\$2,008
15		\$0	\$11,010	\$11,010	0.417	\$4,594
16		\$0	\$4,541	\$4,541	0.394	\$1,787
17		\$0	\$4,541	\$4,541	0.371	\$1,686
18		\$0	\$4,541	\$4,541	0.350	\$1,591
19		\$0	\$4,541	\$4,541	0.331	\$1,501
20		\$0	\$11,010	\$11,010	0.312	\$3,433
21		\$0	\$4,541	\$4,541	0.294	\$1,336
22		\$0	\$4,541	\$4,541	0.278	\$1,260
23		\$0	\$4,541	\$4,541	0.262	\$1,189
24		\$0	\$4,541	\$4,541	0.247	\$1,121
25		\$0	\$11,010	\$11,010	0.233	\$2,565
26		\$0	\$4,541	\$4,541	0.220	\$998
27		\$0	\$4,541	\$4,541	0.207	\$942
28		\$0	\$4,541	\$4,541	0.196	\$888
29		\$0	\$4,541	\$4,541	0.185	\$838
30		\$0	\$11,010	\$11,010	0.174	\$1,917
<b>TOTAL PRESENT WORTH</b>						<b>\$1,002,870</b>

NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16

SOIL ALTERNATIVE 4: LIMITED SURFACE SOIL (EXCEEDING CGs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL AND LUCs  
CAPITAL COSTS

Cost Item	Quantity	Unit	Subcontract	Unit Cost			Subcontract	Extended Cost			Subtotal	
				Material	Labor	Equipment		Material	Labor	Equipment		
<b>1 PROJECT PLANNING</b>												
1.1 Prepare Remedial Design	100	hr			\$33.79		\$0	\$0	\$3,379	\$0	\$3,379	
1.2 Project Scheduling and Procurement	40	hr			\$33.79		\$0	\$0	\$1,352	\$0	\$1,352	
<b>2 MOBILIZATION/DEMobilIZATION</b>												
2.1 Equipment Mob/Demob (Exc., Loader, & Dozier)	2	ea				\$200.00	\$250.00	\$0	\$0	\$400	\$500	\$900
2.2 Mobilize/Demobilize Personnel (3-persons)	2	ea		\$375.00	\$300.00		\$0	\$750	\$600	\$0	\$1,350	
2.3 Portable Toilet	0.5	mo	\$74.18				\$37	\$0	\$0	\$0	\$37	
2.4 Storage Trailer (28' x 10')	0	mo	\$98.33				\$0	\$0	\$0	\$0	\$0	
2.5 Office Trailer (32' x 8')	0	mo	\$221.49				\$0	\$0	\$0	\$0	\$0	
2.6 Site Utilities	0	mo	\$1,000.00				\$0	\$0	\$0	\$0	\$0	
<b>3 DECONTAMINATION</b>												
3.1 Temporary Decon Pad	1	ls		\$450.00	\$400.00	\$155.00	\$0	\$450	\$400	\$155	\$1,005	
3.2 Decon Water Disposal	10	drum	\$125.00				\$1,250	\$0	\$0	\$0	\$1,250	
3.3 Decon Water Storage Drums	10	ea		\$45.00			\$0	\$450	\$0	\$0	\$450	
3.4 PPE (3 p * 5 days * 2 Weeks)	30	m-day		\$30.00			\$0	\$900	\$0	\$0	\$900	
3.5 Decontaminate Equipment (Pressure Washer)	8	ea			\$134.45	\$50.00	\$0	\$0	\$1,076	\$400	\$1,476	
<b>4 SITE PREPARATION</b>												
4.1 Erosion Control Fencing	400	lf		\$0.23	\$1.17		\$0	\$92	\$468	\$0	\$560	
4.2 Collect/Analyze Delineation Samples (TPH & others)	8	ea	\$200.00	\$10.00	\$23.52		\$1,600	\$80	\$188	\$0	\$1,868	
4.3 Construction Surveys (2-man crew)	2	day	\$648.36				\$1,297	\$0	\$0	\$0	\$1,297	
4.4 Utility Location and Site Delineation/Layout	8	hrs			\$33.23		\$0	\$0	\$266	\$0	\$266	
4.5 Concrete Demolition/Removal (6" reinforced)	0	cy	\$45.58				\$0	\$0	\$0	\$0	\$0	
4.6 Site Foreman/FOL	24	hrs			\$65.00		\$0	\$0	\$1,560	\$0	\$1,560	
<b>5 EXCAVATION/BACKFILL</b>												
5.1 Excavate/Load Contaminated Soil (2.0 cy Hyd. Exc.)	89	cy			\$0.68	\$1.71	\$0	\$0	\$61	\$152	\$213	
5.2 Standby, Crawler Mounted 2.0 CY Hydraulic Excavator	100	hrs				\$37.54	\$0	\$0	\$3,754	\$3,754	\$3,754	
5.3 Wheel Loader, 3 cy	40	hrs			\$27.20	\$56.31	\$0	\$0	\$1,088	\$2,252	\$3,340	
5.4 Standby, Wheel Loader, 3 cy	20	hrs				\$14.07	\$0	\$0	\$0	\$281	\$281	
5.5 Health & Safety Monitoring with OVA during Excavation	20	day			\$188.16	\$100.00	\$0	\$0	\$3,763	\$2,000	\$5,763	
5.6 Collect/Analyze Confirmatory Samples	8	ea	\$200.00	\$10.00	\$23.52		\$1,600	\$80	\$188	\$0	\$1,868	
5.7 Import (Offsite) Place, Compact Clean Fill Material	119	cy		\$7.82	\$0.85	\$1.81	\$0	\$931	\$101	\$215	\$1,247	
5.8 Backfill with Clean Excavated Material	0	cy		\$0.28	\$2.02	\$0.76	\$0	\$0	\$0	\$0	\$0	
5.9 Site Foreman/FOL	40	hrs			\$65.00		\$0	\$0	\$2,600	\$0	\$2,600	
<b>6 OFF-SITE TRANSPORTATION/DISPOSAL</b>												
6.1 Waste Profile	4	ls	\$750.00				\$3,000	\$0	\$0	\$0	\$3,000	
6.2 Transport and Dispose of Soil (Non-haz.) in Landfill	125	ton	\$48.00				\$6,000	\$0	\$0	\$0	\$6,000	
6.3 Prepare Shipment Manifests	40	hrs			\$33.23		\$0	\$0	\$1,329	\$0	\$1,329	
<b>7 SITE RESTORATION</b>												
7.1 Top soil (haul and spread)	300	sf	\$4.00				\$1,200	\$0	\$0	\$0	\$1,200	
<b>8 LAND USE CONTROLS</b>												
8.1 Site Survey (2-man crew)	2	days	\$648.36				\$1,297	\$0	\$0	\$0	\$1,297	
8.2 Prepare Land Use Plan	80	hours			\$33.79		\$0	\$0	\$2,703	\$0	\$2,703	
8.3 Modify Master Plan and Prepare Deed Restrictions	60	hours			\$33.79		\$0	\$0	\$2,027	\$0	\$2,027	
<b>Subtotal Direct Capital Costs less Subcontract</b>								\$3,733	\$23,549	\$9,710	\$36,992	

NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16

SOIL ALTERNATIVE 4: LIMITED SURFACE SOIL (EXCEEDING CGs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL AND LUCs

CAPITAL COSTS

Cost Item	Quantity	Unit	Subcontract	Unit Cost			Subcontract	Extended Cost			Subtotal
				Material	Labor	Equipment		Material	Labor	Equipment	
<b>Local Area Adjustment</b>								84%	84%	84%	
								\$3,135	\$19,781	\$8,157	\$31,073
Overhead on Labor Cost @ 30%									\$5,934		\$5,934
G & A on Labor Cost @ 10%									\$1,978		\$1,978
G & A on Material Cost @ 10%								\$314			\$314
<b>Total Direct Capital Cost</b>								\$3,449	\$27,694	\$8,157	\$39,299
Indirects on Total Direct Labor Cost @ 75%									\$20,770		\$20,770
Profit on Total Direct Cost @ 10%											\$3,930
<b>Subtotal</b>											\$63,999
Health & Safety Monitoring @ 3%											\$2,438
<b>Total Field Cost</b>											\$66,438
Subtotal Subcontractor Cost							\$17,281				\$17,281
G & A on Subcontract Cost @ 10%							\$1,728				\$1,728
Profit on Subcontractor Cost @ 5%											\$864
<b>Subcontractor Cost</b>											\$19,873
Contingency on Total Field and Subcontractor Costs @ 10%											\$8,631
Engineering on Total Field and Subcontractor Costs @ 5%											\$4,316
<b>TOTAL Capital COST</b>											\$99,257

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16**

**SOIL ALTERNATIVE 4: LIMITED SURFACE SOIL (EXCEEDING CGs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL AND LUCs  
ANNUAL COSTS**

Cost Item	Quantity	Unit	Unit Cost	Labor Overhead <sup>a</sup>	Total Cost
<b>1 FIVE YEAR SITE REVIEWS (FOR 30 YEAR PERIOD)</b>					
1.1 Site Review Meeting (2-persons for 2-days)					
Project Manager	16	hr	\$40.12	\$40.12	\$1,284
Staff Engineer	16	hr	\$26.44	\$26.44	\$846
ODCs (travel, etc.)	1	ls	\$400.00		\$400
1.2 Five Year Review Report					
Project Manager	8	hr	\$40.12	\$40.12	\$642
Staff Engineer	32	hr	\$26.44	\$26.44	\$1,692
ODCs (photocopies, telephone, etc.)	1	ls	\$250.00		\$250
Subtotal Five Year Review Cost					\$5,114
G&A and Profit @ 15%					\$767
Subtotal					\$5,881
Contingency @ 10%					\$588.11
<b>Total Five Year Review Cost</b>					<b>\$6,469</b>
<b>2 LAND USE CONTROL MONITORING (FOR 30 YEAR PERIOD)</b>					
2.1 Quarterly Site Inspections					
Project Manager (2 hrs for each Inspection)	8	hr	\$40.12	\$40.12	\$642
Staff Engineer	32	hr	\$26.44	\$26.44	\$1,692
2.2 Annual Review and Report					
Project Manager	4	hr	\$40.12	\$40.12	\$321
Staff Engineer	12	hr	\$26.44	\$26.44	\$635
ODCs (photocopies, telephone, etc.)	1	ls	\$250.00		\$250
2.3 Sign/Fence Maintenance					
	1	ls	\$50.00		\$50
Subtotal Land Use Control Monitoring					\$3,590
G&A and Profit @ 15%					\$538
Subtotal					\$4,128
Contingency @ 10%					\$412.80
<b>Total Land Use Control Monitoring Cost</b>					<b>\$4,541</b>

<sup>a</sup> Overhead on professional labor @ 100%.

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
SITE 16**

**SOIL ALTERNATIVE 4: LIMITED SURFACE SOIL (EXCEEDING CGs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL AND LUCs  
PRESENT WORTH ANALYSIS**

Year	Capital Cost	Operation and Maintenance Cost	Annual Cost	Total Yearly Cost	Present-Worth Factor (i = 6%)	Present Worth
0	\$99,257			\$99,257	1.000	\$99,257
1		\$0	\$4,541	\$4,541	0.943	\$4,284
2		\$0	\$4,541	\$4,541	0.890	\$4,041
3		\$0	\$4,541	\$4,541	0.840	\$3,813
4		\$0	\$4,541	\$4,541	0.792	\$3,597
5		\$0	\$11,010	\$11,010	0.747	\$8,227
6		\$0	\$4,541	\$4,541	0.705	\$3,201
7		\$0	\$4,541	\$4,541	0.665	\$3,020
8		\$0	\$4,541	\$4,541	0.627	\$2,849
9		\$0	\$4,541	\$4,541	0.592	\$2,688
10		\$0	\$11,010	\$11,010	0.558	\$6,148
11		\$0	\$4,541	\$4,541	0.527	\$2,392
12		\$0	\$4,541	\$4,541	0.497	\$2,257
13		\$0	\$4,541	\$4,541	0.469	\$2,129
14		\$0	\$4,541	\$4,541	0.442	\$2,008
15		\$0	\$11,010	\$11,010	0.417	\$4,594
16		\$0	\$4,541	\$4,541	0.394	\$1,787
17		\$0	\$4,541	\$4,541	0.371	\$1,686
18		\$0	\$4,541	\$4,541	0.350	\$1,591
19		\$0	\$4,541	\$4,541	0.331	\$1,501
20		\$0	\$11,010	\$11,010	0.312	\$3,433
21		\$0	\$4,541	\$4,541	0.294	\$1,336
22		\$0	\$4,541	\$4,541	0.278	\$1,260
23		\$0	\$4,541	\$4,541	0.262	\$1,189
24		\$0	\$4,541	\$4,541	0.247	\$1,121
25		\$0	\$11,010	\$11,010	0.233	\$2,565
26		\$0	\$4,541	\$4,541	0.220	\$998
27		\$0	\$4,541	\$4,541	0.207	\$942
28		\$0	\$4,541	\$4,541	0.196	\$888
29		\$0	\$4,541	\$4,541	0.185	\$838
30		\$0	\$11,010	\$11,010	0.174	\$1,917
<b>TOTAL PRESENT WORTH</b>						<b>\$177,558</b>