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FINAL FEASIBILITY STUDY ADDENDUM FOR SITE 12 NAS WHITING FIELD FL
9/27/2005
TETRA TECH NUS

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-94-D-0888



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Feasibility Study Addendum for Site 12, Tetraethyl Lead Disposal Area Surface and Subsurface Soil

Naval Air Station Whiting Field
Milton, Florida

USEPA ID No. FL2170023244

Contract Task Order 0369

September 2005



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

**FEASIBILITY STUDY ADDENDUM
FOR
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
SURFACE AND SUBSURFACE SOIL**

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

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

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This document, *Feasibility Study Addendum for Site 12, Tetraethyl Lead Disposal 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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TABLE OF CONTENTS

| <u>SECTION</u> | <u>PAGE</u> |
|---|--------------------|
| PROFESSIONAL ENGINEER CERTIFICATION | iii |
| ACRONYMS..... | v |
| 1.0 INTRODUCTION | 1-1 |
| 1.1 PURPOSE | 1-2 |
| 1.2 REPORT ORGANIZATION | 1-2 |
| 2.0 ENVIRONMENTAL CONDITIONS..... | 2-1 |
| 2.1 NATURE AND EXTENT OF CONTAMINATION..... | 2-1 |
| 2.2 REVISED HUMAN HEALTH RISK ASSESSMENT | 2-1 |
| 2.2.1 Selection of Human Health COPCs | 2-3 |
| 2.2.2 Risk Characterization Summary..... | 2-4 |
| 2.2.3 Evaluation of Results | 2-4 |
| 3.0 REMEDIAL ACTION OBJECTIVES | 3-1 |
| 3.1 REVISED AND CLEANUP GOALS..... | 3-1 |
| 3.2 REVISED CONSTITUENTS OF CONCERN | 3-2 |
| 3.3 REVISED AREAS AND VOLUMES OF SOIL REQUIRING REMEDIAL ACTION | 3-5 |
| 4.0 AMENDED DESCRIPTION AND EVALUATION OF REMEDIAL ALTERNATIVES..... | 4-1 |
| 4.1 AMENDED DESCRIPTION OF ALTERNATIVES..... | 4-1 |
| 4.2 AMENDED EVALUATION OF ALTERNATIVES | 4-1 |
| 4.2.1 Overall Protection of Human Health and the Environment | 4-1 |
| 4.2.2 Compliance with ARARs..... | 4-1 |
| 4.2.3 Long-Term Effectiveness and Permanence | 4-1 |
| 4.2.4 Reduction of Mobility, Toxicity, or Volume through Treatment | 4-5 |
| 4.2.5 Short-Term Effectiveness | 4-5 |
| 4.2.6 Implementability | 4-5 |
| 4.2.7 Cost | 4-5 |
| 4.3 SUMMARY..... | 4-5 |
| REFERENCES | R-1 |

TABLES

| <u>NUMBER</u> | <u>PAGE</u> |
|---|--------------------|
| 3-1 Determination of Revised Cleanup Goals at Site 12 | 3-3 |
| 3-2 Revised Constituent of Concern Evaluation | 3-4 |
| 4-1 Comparison of Original FS and FSA Description of Soil Remedial Alternatives..... | 4-2 |
| 4-2 Summary of Comparative Impact of Changes in COCs on Evaluation of Remedial Alternatives | 4-3 |

FIGURES

| <u>NUMBER</u> | <u>PAGE</u> |
|---|--------------------|
| 2-1 Location of Surface and Subsurface Soil Samples, Site 12..... | 2-2 |

ACRONYMS

| | |
|------------|--|
| ABB-ES | ABB Environmental Services, Inc. |
| ARAR | applicable or relevant and appropriate requirements |
| AVGAS | Aviation Gasoline |
| bls | below land surface |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| CG | Cleanup Goal |
| COCs | Constituents of Concern |
| COPCs | Constituents of Potential Concern |
| EPC | Exposure Point Concentration |
| F.A.C. | Florida Administrative Code |
| FDEP | Florida Department of Environmental Protection |
| FS | Feasibility Study |
| FSA | Feasibility Study Addendum |
| ft | feet/foot |
| GIR | General Information Report |
| HHRA | Human Health Risk Assessment |
| HI | Hazard Index |
| HLA | Harding Lawson and Associates |
| mg/kg | milligrams per kilogram |
| NAS | Naval Air Station |
| NAVFAC EFD | |
| SOUTH | Southern Division, Naval Facilities Engineering Command |
| PRG | Preliminary Remediation Goal |
| RAGS | Risk Assessment Guidance for Superfund |
| RAOs | Remedial Action Objectives |
| RBC | Risk-Based Concentration |
| RI | Remedial Investigation |
| SCTL | Soil Cleanup Target Level |
| SVOC | Semi-Volatile Organic Compound |
| TBC | To Be Considered |
| TRPH | Total Recoverable Petroleum Hydrocarbon |
| TtNUS | Tetra Tech NUS, Inc. |
| USEPA | United States Environmental Protection Agency |
| VOCs | Volatile Organic Compounds |

1.0 INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS), under contract N62467-94-D-0888 to the Department of the Navy, Southern Division, Naval Facilities Engineering Command (NAVFAC EFD SOUTH), is submitting this Feasibility Study Addendum (FSA) to address changes at , Site 12, Tetraethyl Lead Disposal Area, since the original Feasibility Study (FS) was submitted in July 2001 [Harding Lawson and Associates (HLA), 2001]. The original FS addressed surface and subsurface soils at Naval Air Station (NAS) Whiting Field, Site 12.

The changed conditions at Site 12 addressed in this FSA include:

- Arsenic originally identified as a constituent of concern (COC) at Site 12 was determined to be naturally occurring at Site 12 - 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 12.
- United States Environmental Protection Agency (USEPA) Region IX Preliminary Remediation Goals (PRGs) used as Screening Criteria - Over the course of the investigations at this site, 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 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 individual metal constituents, aluminum, iron, manganese, and vanadium, have no direct evidence of site-related use at Site 12 and the process and procedures at this site did not likely contribute to the presence of these inorganic analytes in surface soil. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field" presenting the technical basis for this determination. Considering the information presented above, aluminum, iron, manganese and vanadium are not considered constituents of potential concern (COPCs) for Site 12 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 12 at NAS Whiting Field. Remedial Alternatives were developed in the original FS (HLA, 2001).

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 9 at NAS Whiting Field is 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, 2004). These sites were previously evaluated in 1999 and 2000 using the methodology described in the RI and FS General Information Report (GIR) [ABB Environmental Services, Inc. (ABB-ES), 1998]. 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 and to update any risk assessment results with potential impact on risk management decisions for these sites.

1.2 REPORT ORGANIZATION

This FSA is organized into four chapters. Chapter 1.0 presents the purpose of the FSA. Chapter 2.0 discusses environmental conditions at the site including the revised HHRA, Chapter 3.0 presents the remedial action objectives (RAOs), and finally, Chapter 4.0 presents and discusses revised remedial action alternatives.

2.0 ENVIRONMENTAL CONDITIONS

Site 12 is less than 0.1 acre in size and is located in the southeastern section of the facility. The disposal area consists of six earth-covered sludge mounds within a fenced area of approximately 100 feet (ft) by 25 ft. The mounds range from approximately 3 to 5 ft in height and 5 to 10 ft in diameter. Each sludge pile reportedly contained 200 to 400 gallons of tank bottom sludge generated from cleaning the north and south aqua system fuel storage tanks and fuel filters. The piles are reported to be contaminated with tetraethyl lead, a component of aviation gasoline (AVGAS). The sludge was stockpiled at its current location in May 1968.

The approximate location of Site 12 is shown on Figure 2-1. There are currently no buildings at Site 12. No permanent surface water sources exist at Site 12. However, an unlined "Y" drainage ditch is located immediately adjacent to the southern border of the site and receives any surface runoff from the area. The drainage ditch ultimately discharges to Big Cold Water Creek, approximately 1.7 miles east of the site.

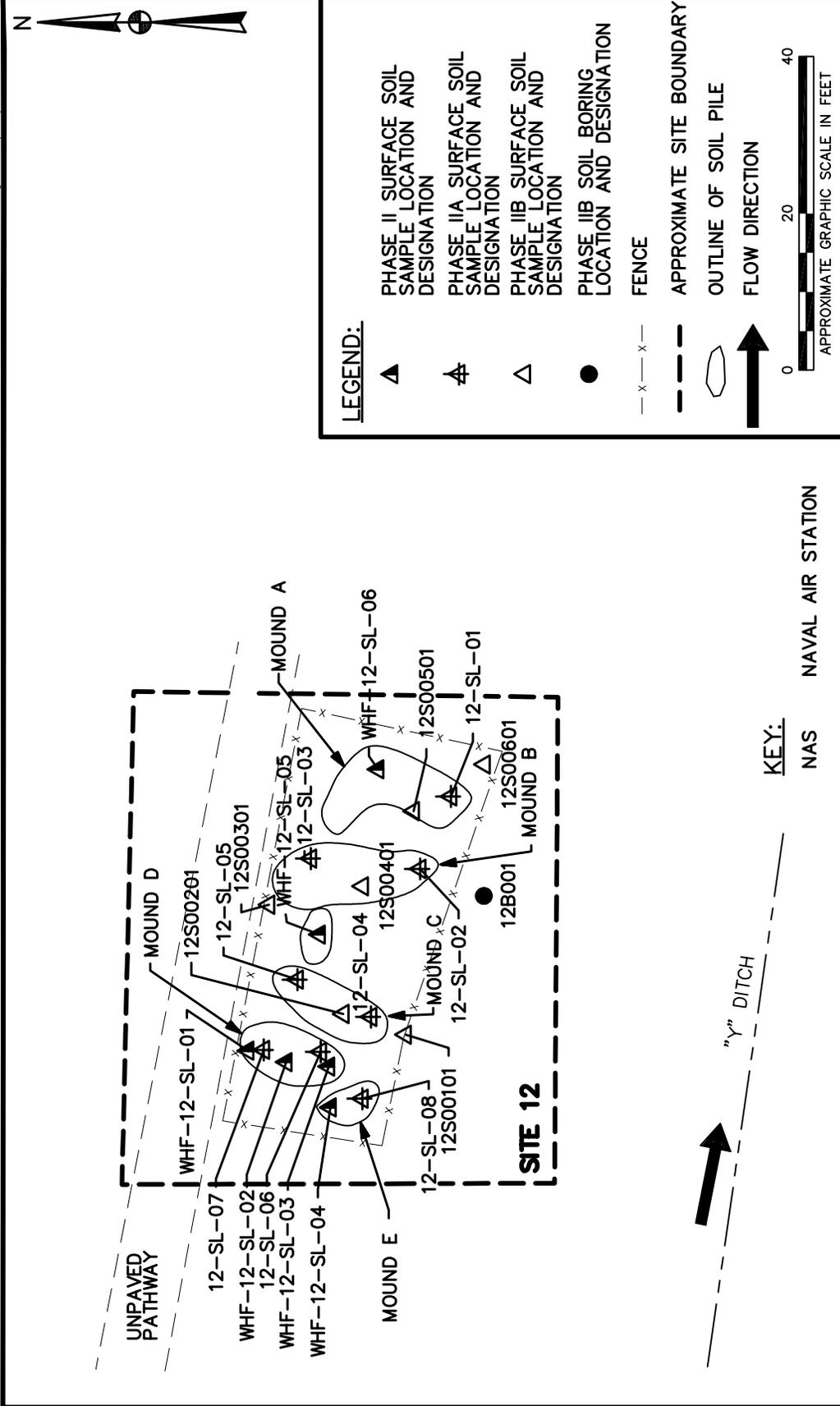
Currently, the site consists of vacant, unused land densely vegetated with native species. The terrain at Site 12 is relatively flat. These site characteristics limit the current potential for fugitive dust emissions and soil transport by surface water runoff.

2.1 NATURE AND EXTENT OF CONTAMINATION

Environmental conditions at Site 12 are described in detail in the RI Report issued in 1999 (HLA, 1999) and the FS in 2001 (HLA, 2001). Sections 1.3 and 2.0 of the original FS present the nature and extent of contamination at Site 12. Constituents detected in the surface soils include four semi-volatile organic compounds (SVOCs), one pesticide, and 20 inorganic constituents, as well as cyanide and total recoverable petroleum hydrocarbons (TRPH). Constituents detected in the subsurface soils include one volatile organic compound (VOC), one SVOC, and 20 inorganic constituents. Only the revised HHRA at Site 12 is discussed in the following sections.

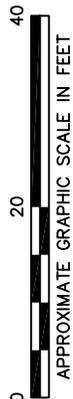
2.2 REVISED HUMAN HEALTH RISK ASSESSMENT

This section presents the revised HHRA results using analytical data from soils. The revised HHRA includes the changed conditions discussed in Section 1.0. The original HHRA was included in the RI Report (HLA, 1999).



LEGEND:

- ▲ PHASE II SURFACE SOIL SAMPLE LOCATION AND DESIGNATION
- ⊕ PHASE IIA SURFACE SOIL SAMPLE LOCATION AND DESIGNATION
- △ PHASE IIB SURFACE SOIL SAMPLE LOCATION AND DESIGNATION
- PHASE IIB SOIL BORING LOCATION AND DESIGNATION
- x - x - FENCE
- - - - - APPROXIMATE SITE BOUNDARY
- OUTLINE OF SOIL PILE
- ➔ FLOW DIRECTION



KEY:

NAS NAVAL AIR STATION



| | |
|----------------------------------|-------------|
| CONTRACT NO. 0006 | |
| OWNER NO. 0000 | |
| APPROVED BY | DATE |
| DRAWING NO. FIGURE 2-1 | |
| REV. 0 | |

| | |
|--|--|
| LOCATION OF SURFACE AND SUBSURFACE SOIL SAMPLES | |
| SITE 12, TETRAETHYL LEAD DISPOSAL AREA | |
| FEASIBILITY STUDY APPENDUM | |
| NAS WHITING FIELD | |
| MILTON, FLORIDA | |

| | |
|--------------------------|------------------------|
| DRAWN BY HJB | DATE 3/15/05 |
| CHECKED BY | DATE |
| REVISED BY | DATE |
| SCALE AS NOTED | |

The first step of the re-evaluation was to determine a revised list of COPCs. The re-evaluation considered exposure to surface and subsurface soils 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, manganese, and vanadium are not considered COPCs for Site 12 surface or subsurface soils; therefore, these inorganic constituents are not considered in this 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 this risk evaluation (USEPA, 2001).

For the revised HHRA, the exposure point concentration (EPC) was considered to be the maximum detected concentration (worst case condition).

The revised HHRA for Site 12 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, 2002) to conservatively assess exposure and toxicity.

2.2.1 Selection of Human Health COPCs

Surface Soils

All soil samples collected from 0 to 1 ft below land surface (bls) at Site 12 were evaluated for surface soil COPC selection. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region IX PRGs and FDEP SCTLs for residential exposures was conducted.

Dieldrin was the only constituent detected at concentrations in excess of the direct contact, risk based COPC screening levels and background concentrations and consequently was retained as a COPC for surface soil at Site 12. The detected concentration exceeded the simple apportioned PRG, but was less

than the non-apportioned PRG and simple apportioned and non-apportioned SCTLs. No other COPCs were identified in surface soil.

Subsurface Soils

All soil samples collected from 2 to 11 ft bls at Site 12 were evaluated for subsurface soil COPC selection. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region IX PRGs and FDEP SCTLs for residential exposures was conducted.

No COPCs were identified in subsurface soil at Site 12.

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 proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

Quantitative risk estimates for potential human receptors were developed for the identified COPCs (i.e., antimony). Potential risks and Hazard Indices (HIs) were calculated and are summarized in the revised HHRA. No COCs were identified for surface or subsurface soil based on the risk characterization.

Cumulative HIs for exposures to surface soil were less than 1.0 for all receptors evaluated, indicating adverse non carcinogenic effects are not anticipated under the conditions defined in the exposure assessment.

2.2.3 Evaluation of Results

There are no carcinogenic or non-carcinogenic risks associated with exposure to surface or subsurface soil (ingestion and dermal contact) for a resident (adult and child) at Site 12. Dieldrin was the only constituent detected at concentrations in excess of risk based COPC screening levels. The maximum detected dieldrin concentration of 0.013 milligrams per kilograms (mg/kg) is less than the FDEP SCTL of 0.07 mg/kg and only slightly exceeds the apportioned USEPA Region IX PRG of 0.005 mg/kg.

The HI for exposure to surface and subsurface soils by an adult are less than 1.0 indicating no unacceptable risks. The HI for exposure to surface and subsurface soil by a child is also less than 1.0, indicating no unacceptable risks.

The HI for exposure to surface and subsurface soils for the other potential receptors (the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) are all less than 1.0 indicating no unacceptable risks for any potential receptor.

3.0 REMEDIAL ACTION OBJECTIVES

The RAOs presented in the original FS for Site 12 were:

RAO 1: Reduce human health risk associated with exposure to surface soil with arsenic concentrations greater than action levels.

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

- Unacceptable human health risk for direct exposure to surface or subsurface soil based on the site specific cleanup goal for arsenic.
- FDEP SCTLs (residential land use).
- USEPA Region IX PRG (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 12. The current and future use of the property at this site remains non-residential/recreational, and the current and future receptors are trespassers and recreational users.

Based on the current and future use receptors, two RAOs are applicable for Site 12.

RAO 1: To protect human health from carcinogenic and noncarcinogenic risks associated with incidental ingestion of, inhalation of, and dermal contact with contaminated soils.

RAO 2: To comply with federal and state applicable or relevant and appropriate requirements (ARARs) and to be considered (TBC) criteria in accordance with accepted USEPA and FDEP guidelines.

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

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

3.1 REVISED AND 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 determine COCs, to estimate areas and volumes of impacted media and set performance standards for potential remedial alternatives.

Cleanup Goals are determined based on ARARs and “to be considered” 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, 2002). The current and future use of the site is for non-residential/recreational purposes; therefore, the exposure pathways are trespassers and recreational users.

Cleanup of inorganic analytes below their established background concentrations will not be performed; therefore, background concentrations will be used as the lower limit for CGs. The CG selection process is summarized below.

The lower value of the FDEP SCTLs (Chapter 62-777, F.A.C.) and the USEPA Region IX PRGs for residential direct exposure will be used as CGs. Background concentration will be used as the lower limit for the CG of inorganic COCs. Table 3-1 provides a list of the revised surface and subsurface soil CGs for Site 12.

3.2 REVISED CONSTITUENTS OF CONCERN

A re-evaluation of the constituents remaining in surface and subsurface soil was conducted in the revised HHRA. The RI identified only one COC, arsenic, in surface soil at Site 12. The revised HHRA identified dieldrin as the only COPC for surface soil at Site 12.

The revised COCs (or lack of) have been 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 no COCs for surface or subsurface soil at Site 12.

**TABLE 3-1
DETERMINATION OF REVISED CLEANUP GOALS AT SITE 12
NAS WHITING FIELD
MILTON, FLORIDA**

| Constituent of Potential Concern ¹ | Units | 62-777, F.A.C. Residential SCTL ² | USEPA Region IX Residential PRGs ³ | Lower Value | Risk Driver ⁴ | Surface Soil Background | Surface Soil CG | Subsurface Soil Background | Subsurface Soil CG |
|---|-------|--|---|-------------|--------------------------|-------------------------|-----------------|----------------------------|--------------------|
| Dieldrin | mg/kg | 0.06 | 0.03 | 0.03 | C | NA | 0.03 | NA | NA |

¹ Combined list of all COPCs for Site 12.

² FDEP Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C. April 2005.

³ USEPA Region IX Preliminary Remediation Goal Table, October 2002. (note: 1/10th value used for non-carcinogens).

⁴ Risk Driver Codes: N = Non-carcinogen, C = Carcinogen.

CG – Cleanup Goal

mg/kg – milligrams per kilogram

NA – Not Applicable

**TABLE 3-2
REVISED CONSTITUENT OF CONCERN EVALUATION
SURFACE SOIL
SITE 12**

**NAS WHITING FIELD
MILTON, FLORIDA**

| Constituent of Potential Concern | Units | Maximum Detected Concentration | Maximum Qualifier | Representative Concentration ¹ | | | CG | COC |
|----------------------------------|-------|--------------------------------|-------------------|---|------------------------|------------------------|------|-----|
| | | | | Value | Statistic ² | Rationale ³ | | |
| Dieldrin | mg/kg | 0.013 | None | 0.013 | max | n<10 | 0.03 | no |

¹For 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.

²Statistics: 95% UCL of log-transformed data (95% UCL-T), 95% UCL of data (95% UCL-N). Maximum value used (max) since the sample size was <10 samples.

³Rationale

(1) The 95% UCL exceeded the maximum (n<10); therefore, the maximum was used.

mg/kg = milligrams per kilogram

CG = Cleanup goal

COC = Constituent of concern

UCL = upper confidence limit

3.3 REVISED AREAS AND VOLUMES OF SOIL REQUIRING REMEDIAL ACTION

Because there are no COCs for Site 12, there are no areas of soil with COCs exceeding CGs and therefore, volumes of soil requiring remedial action will not be estimated.

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 12 were presented in the FS. Each technology was then screened based on site- and waste-limiting characteristics. Three soil remedial alternatives were developed in the original FS representing a range of options for Site 12 (HLA, 2001) This section of the FSA presents a revised description of the three original remedial alternatives. Table 4-1 shows a comparison between the soil remedial alternatives identified in the original FS and this FSA.

4.2 AMENDED EVALUATION OF ALTERNATIVES

This section compares the impact of the changes in surface soil COCs on the evaluation of the three remedial alternatives in accordance with the seven Comprehensive Environmental Response, Compensation and Liability Act (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

Due to the changes discussed in Section 1.0 and the elimination of COCs as determined by the revised HHRA for Site 12, there is a change in the relative overall protection of human health and the environment provided by Alternative 1 (No Action). Alternative 1 becomes protective of human health and the environment and joins Alternatives 2 and 3 which remain protective of human health and the environment.

4.2.2 Compliance with ARARs

As mentioned in Section 4.2.1, the elimination of COCs as determined by the revised HHRA for Site 12 results in a change in the compliance of Alternative 1 with ARARs. Alternative 1 is now in compliance with constituent-, location-, and action-specific ARARs. There is no change in the compliance of Alternatives 2 and 3 with constituent-, location-, and action-specific-ARARs.

4.2.3 Long-Term Effectiveness and Permanence

As mentioned in Section 4.2.1, the elimination of COCs impact the long-term effectiveness and permanence of Alternative 1. Alternative 1 now provides long-term effectiveness and permanence and Alternatives 2 and 3 continue to provide long-term effectiveness and permanence.

**TABLE 4-1
COMPARISON OF ORIGINAL FS AND FSA DESCRIPTION OF SOIL REMEDIAL ALTERNATIVES
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAS WHITING FIELD
MILTON, FLORIDA**

| Alternative Number | | Alternative Type | | Representative Process Options Combined into Alternatives | | Alternative Description | |
|--|--|--|--|---|---------------------------------|---|--|
| FS (March 2001) | FSA (July 2005) | FS (March 2001) | FSA (July 2005) | FS (March 2001) | FSA (July 2005) | FS (March 2001) | FSA (July 2005) |
| Alternative 1 No Action | Alternative 1 No Action | No Action | None | None | None | Five-year Reviews. | No Action |
| Alternative 2 LUCs | Alternative 2 LUCs | Limited Action – No or Minimal Treatment | Limited Action – No or Minimal Treatment | LUCs | LUCs | LUCs including LUCAP and LUCIP Posting of warning signs. Five-year site reviews. | LUCs (LUC RD will establish LUCIP). Posting of warning signs (Five-year review will be part of LUC RD). |
| Alternative 3 Surface Soil (exceeding PRGs) Removal, and LUCs | Alternative 3 Surface Soil (exceeding CGs) Removal and LUCs | Treatment /Bulk Removal – Minimizes Long-Term Management | Treatment /Bulk Removal – Minimizes Long-Term Management | LUCs, Bulk Excavation, Disposal | LUCs, Bulk Excavation, Disposal | LUCs including LUCAP and LUCIP Excavation/disposal of surface soil exceeding PRGs. Backfill excavations with clean fill. Establish vegetative cover. Posting of warning signs. Five-year site reviews. | LUCs (LUC RD will establish LUCIP). Excavation/disposal of surface soil exceeding CGs. Backfill excavations with clean fill. Establish vegetative cover. Posting of warning signs. (Five-year review will be part of LUC RD). |

CG = Cleanup Goal
LUCs = Land Use Controls
LUCAP = LUC Assurance Plan
LUCIP = LUC Implementation Plan
PRGs = Preliminary Remediation Goals (site specific goal as defined in the FS; similar to the CG in the FSA).
RD = Remedial Design

TABLE 4-2
SUMMARY OF COMPARATIVE IMPACT OF CHANGES IN COCs ON EVALUATION OF REMEDIAL ALTERNATIVES
SITE 12 FS ADDENDUM

NAS WHITING FIELD
MILTON, FLORIDA

PAGE 1 OF 2

| CRITERIA | ALTERNATIVE 1 No Action | ALTERNATIVE 2 LUCs | ALTERNATIVE 3 Surface Soil (exceeding CGs) Removal, and LUCs |
|---|------------------------------|-----------------------|--|
| THRESHOLD CRITERIA | | | |
| Overall Protection of Human Health and the Environment | | | |
| Human Health Protection | With no COCs, now protective | No change | No change |
| Environmental Protection | With no COCs, now protective | No change | No change |
| Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) | | | |
| Compliance with Chemical-Specific ARARs | With no COCs, now compliant | No change | No change |
| Compliance with Action-Specific ARARs | With no COCs, now compliant | No change | No change |
| Compliance with Location-Specific ARARs | With no COCs, now compliant | No change | No change |
| Compliance with Other Criteria | No change | No change | No change |
| BALANCING CRITERIA | | | |
| Long-Term Effectiveness and Permanence | | | |
| Reduction in Residual Risk | With no COCs, no risk | No change | No change |
| Long-Term Reliability of Controls | No change | No change | No change |
| Need for 5-Year Review | With no COCs, not needed | No change | No change |
| Prevention of Exposure to Residuals | No change | No change | No change |
| Potential Need for Replacement of Technical Components after Remedial Objectives Are Achieved | No change | No change | No change |
| Long-Term Management | No change | No change | No change |
| Reduction of Mobility, Toxicity, or Volume through Treatment | | | |
| Amount Destroyed or Treated | No change | No change | No change |
| Reduction in Mobility, Toxicity, or Volume | No change | No change | No change |
| Irreversibility of Treatment | No change | No change | No change |
| Type and Quantity of Residuals Remaining after Treatment | No change | No change | No change |

TABLE 4-2
SUMMARY OF COMPARATIVE IMPACT OF CHANGES IN COCs ON EVALUATION OF REMEDIAL ALTERNATIVES
SITE 12 FS ADDENDUM

NAS WHITING FIELD
MILTON, FLORIDA

PAGE 2 OF 2

| CRITERIA | ALTERNATIVE 1 No Action | ALTERNATIVE 2 LUCs | ALTERNATIVE 3 Surface Soil (exceeding CGs) Removal and LUCs |
|---|----------------------------|-------------------------------|---|
| Short-Term Effectiveness | | | |
| Community Protection During Implementation | No change | No change | No change |
| Worker Protection During Implementation | No change | No change | No change |
| Environmental Impacts | No change | No change | No change |
| Construction Time | No change | No change | No change |
| Time Until RAOs and CGs are Achieved | No change | No change | No change |
| Implementability | | | |
| Ability to Construct and Operate the Technology | No change | No change | No change |
| Reliability of Technology | No change | No change | No change |
| Ease of Undertaking Additional Remedial Action, if Required | No change | No change | No change |
| Ability to Monitor Effectiveness | No change | No change | No change |
| Permitting Requirements | No change | No change | No change |
| Coordination with Other Agencies | No change | No change | No change |
| Availability of Services and Capabilities | No change | No change | No change |
| Availability of Equipment, Specialists, and Materials | No change | No change | No change |
| Cost^a | | | |
| Capital Costs | No change | No change | No change |
| Short-Term O&M | No change | No change | No change |
| Long-Term O&M | | | |
| 5-Year Review | a | No change | No change |
| Land-Use Controls | No change | No change | No change |
| Total Project Present Worth Cost | No change \$0 (Total) | No change \$60,000 (Total) | No change NA |

NOTES:

- ARAR
- COC
- LUC
- RAO
- CG
- NAI
- Not Available

Applicable or relevant and appropriate requirement
Constituent of concern
Land use control
Remedial action objective
Cleanup goals
Not Available

^aThe 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.

4.2.4 Reduction of Mobility, Toxicity, or Volume through Treatment

The elimination of COCs does not impact Alternative 1. Alternative 1 does not provide the reduction of mobility, toxicity, or volume because there is no action. The elimination of COCs also does not impact the reduction of mobility, toxicity or volume provided by Alternatives 2 and 3.

4.2.5 Short-Term Effectiveness

The elimination of COCs does not impact Alternative 1. Alternative 1 will not provide short-term effectiveness or risks because there is no action. Alternatives 2 and 3 would still provide short-term effectiveness.

4.2.6 Implementability

The elimination of COCs has no impact on the implementability of any of the three alternatives.

4.2.7 Cost

The elimination of COCs does not have an impact on the costs for any of the three alternatives. The cost to implement each of the three alternatives as estimated in the original FS cost estimate would remain the same with a slight increase to adjust for inflation.

4.3 SUMMARY

As discussed in the above sections and further illustrated on Table 4-2, recent changes and developments at Site 12 have had some impact on the findings of the original FS. In particular, the conversion of Alternative 1 to a viable, compliant, implementable, and cost effective remedial alternative for Site 12 surface and subsurface soils. The remedial alternatives and their comparative evaluation as presented in this FSA are not significantly different from those presented in the original FS except for Alternative 1.

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