

**DRAFT FINAL ENGINEERING EVALUATION/COST ANALYSIS
FOR PROPOSED NON-TIME-CRITICAL REMOVAL ACTION
ERP SITE ID FR038
BEACON BEACH SKEET RANGE (OU 15)
TYNDALL AIR FORCE BASE, FLORIDA**

**CONTRACT NO. FA8903-08-D-8770
TASK ORDER NO. 0201**

Prepared by:

AECOM Technical Services, Inc.
Destin, Florida

Under Contract to:

Department of the Air Force
Air Force Civil Engineer Center
2261 Hughes Avenue, Suite 155
Lackland Air Force Base, Texas 78236-9853

Revision 1

March 2013

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I hereby submit that I am currently registered in good standing as a Professional Engineer in the state of Florida. To the best of my knowledge, all of the methods proposed within this Engineering Evaluation/Cost Analysis for Proposed Non-Time-Critical Removal Action document are in accordance with applicable state and federal regulations and accepted professional practices.



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LIST OF ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
AFCEC	Air Force Civil Engineer Center
AFCEE	Air Force Center for Engineering and the Environment
AFB	Air Force Base
ARAR	Applicable or Relevant and Appropriate Requirement
BGP	Base General Plan
CAD	Computer-Aided Design
CD	Compact Disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES	Civil Engineering Squadron
CSM	Conceptual Site Model
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ERPIMS	Environmental Restoration Program Information Management System
FDEP	Florida Department of Environmental Protection
IDW	Investigation-derived Waste
ITRC	Interstate Technology Regulatory Council
LUC	Land Use Control
LUCP	Land Use Controls Plan
mg/kg	milligram per kilogram
mg/L	milligram per liter
NTCRA	Non-Time-Critical Removal Action
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbon
PMO	Project Management Office
ppm	parts per million
RAL	Removal Action Level
RAO	Removal Action Objective
RI/FS	Remedial Investigation/Feasibility Study
RSL	Regional Screening Level
SCTL	Soil Cleanup Target Level
SDG	Sample Delivery Group
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
UHC	Underlying Hazardous Constituent
XRF	X-ray Fluorescence
yd ³	cubic yards

EXECUTIVE SUMMARY

AECOM Technical Services, Inc. (AECOM) was retained by the Air Force Civil Engineer Center (AFCEC, formerly Air Force Center for Engineering and the Environment [AFCEE]) under Contract No. FA8903-08-D-8770, Task Order No. 0201 to complete an Engineering Evaluation/Cost Analysis (EE/CA) for potential non-time-critical removal action (NTCRA) at specific areas of Environmental Restoration Program (ERP) Site ID FR038, Beacon Beach Skeet Range Operable Unit 15 (the “Site”), located at Tyndall Air Force Base, Florida that are designated for development. These specific development areas (**Figure 1-1 and 1-2**) include:

- **Area A:** Parking lot, 1.43 acres, north of the First Air Force Headquarters Complex;
- **Area B:** Parking lot, 0.45 acres, northwest of the First Air Force Headquarters Complex;
- **Area C:** Expansion of the Education Center (Building 1230); and
- **Area D:** Expansion to subsurface/surface infrastructure within the 25-meter security buffer around the First Air Force Headquarters Complex.

An EE/CA Approval Memorandum (AECOM, March 2012) was prepared and documented that sufficient evidence existed to justify proceeding with the preparation of an EE/CA to address contaminants above Environmental Protection Agency (EPA) Regional Screening Levels (RSLs; EPA, April 2012) and/or Florida Soil Cleanup Target Levels (SCTLs; Florida Department of Environmental Protection [FDEP], April 2005) within these designated development areas. However, the Site information (including previous Site sampling results) used to justify the preparation of an EE/CA for these designated development areas was insufficient in quantity to develop removal action alternatives. As a result, additional field investigation activities were conducted in May 2012 to further refine the extent of contaminant source material (lead shot and clay pigeon fragments) and associated contaminated soil within these designated development areas.

This EE/CA has been generated to document the May 2012 field investigation activities and determine if a NTCRA is necessary for the development areas within the Site, and if determined to be necessary; to develop removal action objectives (RAOs) to evaluate the effectiveness, implementability, and cost of potential removal action alternatives that could be used for the remediation of contaminant source material and contaminated soil within these areas, and to recommend a removal action alternative. The primary threat to human health and the environment is via direct exposure pathways including inhalation of airborne particulates, dermal absorption, and incidental ingestion.

The recommended alternative for the NTCRA presented in this EE/CA addresses identified Site contaminants in soil within the development areas only. Long-term remedial action at Site ID FR038 (including groundwater, if necessary) will be implemented after completion of the Site Remedial Investigation/Feasibility Study (RI/FS), Proposed Plan and Record of Decision.

RAOs for the NTCRA are:

- Minimize direct exposure pathways (incidental ingestion, dermal absorption, and inhalation of airborne particulates) to Site-related contaminants identified in Site soil by human and ecological receptors;
- Attain Removal Action Levels (RALs)

The RALs proposed for the four designated project areas at the Site include the applicable EPA RSLs (EPA, April 2012) and Florida SCTLs (FDEP, April 2005) for lead, arsenic, antimony, and PAHs as dictated by current and anticipated future land use.

The RAOs along with Comprehensive Environmental Response, Compensation, and Liability Act evaluation criteria were used to develop, evaluate, and compare various NTCRA alternatives that are intended to represent the full range of possibilities for the restoration of the four designated development areas addressed by this EE/CA. The three NTCRA alternatives developed in this EE/CA are as follows:

- Alternative 1: No Action/Land Use Controls (LUCs).
- Alternative 2: LUCs, Soil Removal to EPA Industrial RSLs and Florida Industrial SCTLs, and Disposal.
- Alternative 3: LUCs, Soil Removal to EPA Residential RSLs and Florida Residential SCTLs, and Disposal.

Based on a comprehensive assessment and comparison of the three NTCRA alternatives developed for this EE/CA, Alternative 2, LUCs, Soil Removal to EPA Industrial RSLs and Florida Industrial SCTLs, and Disposal, is recommended for the four designated development areas.

Alternative 1 would not achieve the applicable RAOs developed in Section 2.2. It would reduce but not eliminate the risk to human health and the environment by limiting direct exposure to contaminant source material (lead shot and clay pigeon fragments) and contaminated soil through the interim LUC program that is currently in place at the Site. Because contaminant source material and contaminated soil would remain as it currently exists at the four development areas, the potential for direct exposure would always be present. Personnel working at the Site could potentially be exposed to existing contamination by walking through and/or parking in contaminated areas.

To varying degrees, Alternatives 2 and 3 both address the primary potential threat to human health and the environment that is posed by direct exposure to contaminant source material and contaminated soil that is present at the development areas. Through a combination of soil excavation to EPA Industrial RSLs and Florida Industrial SCTLs and a continuation of existing LUCs, Alternative 2 is more effective than Alternative 1, but it is not as effective as Alternative 3 at minimizing the potential direct exposure threat to human health and the environment.

Unlike Alternative 1, Alternatives 2 and 3 would attain RALs. Alternative 2 would attain the Industrial RALs (i.e., EPA Industrial RSLs and Florida Industrial SCTLs) while Alternative 3 would attain the Residential RALs (i.e., EPA Residential RSLs and Florida Residential SCTLs); however, the estimated cost to meet this RAO via Alternatives 2 and 3 is significant. Alternative 3 would require substantially more removal and disposal of contaminated soil when compared to Alternative 2. In addition, the removal of portions of the completed parking lot at Area B and the removal of the expansion of the Education Center at Area C would be necessary in order to achieve Residential RALs further complicating and adding to the cost of Alternative 3.

Because the current and anticipated future land use for the Site is industrial, Alternative 2 is the recommended NTCRA alternative for this Site.

EPA Region 4 and FDEP were provided an opportunity to review and comment on the draft EE/CA, revision 0, dated December 2012. The Air Force received correspondence from FDEP (18 February 2013) indicating that the draft EE/CA was found to be “adequate for its intent and approved”. No EPA regulatory review comments on the draft EE/CA or request for a review period extension were received by the Air Force within 60-days of document submission.

1.0 INTRODUCTION

AECOM Technical Services, Inc. (AECOM) was retained by the Air Force Civil Engineer Center (AFCEC, formerly Air Force Center for Engineering and the Environment [AFCEE]) under Contract No. FA8903-08-D-8770, Task Order No. 0201 to complete an Engineering Evaluation/Cost Analysis (EE/CA) for potential non-time-critical removal action (NTCRA) at specific areas of Environmental Restoration Program (ERP) Site ID FR038, Beacon Beach Skeet Range Operable Unit 15 (the “Site”), located at Tyndall Air Force Base (AFB), Florida that are designated for development. These specific development areas (**Figure 1-1 and 1-2**) include:

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This EE/CA has been generated to document the May 2012 field investigation activities and determine if a NTCRA is necessary for the development areas within the Site, and if determined to be necessary, to develop removal action objectives (RAOs) to evaluate the effectiveness, implementability, and cost of potential removal action alternatives that could be used for the remediation of contaminant source material and contaminated soil within these areas, and to recommend a removal action alternative. The recommended alternative for the NTCRA presented in this EE/CA addresses identified Site contaminants in soil within the development areas only. Long-term remedial action at Site ID FR038 (including groundwater, if necessary) will be implemented after completion of the Site Remedial Investigation/Feasibility Study (RI/FS), Proposed Plan, and Record of Decision.

This EE/CA was developed to be consistent with EPA requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.1 BRIEF SITE DESCRIPTION

The Site was used as a shotgun skeet range for training Army Air Corps gunners for approximately 20 years, from 1943 to 1964. The Site encompasses approximately 74 acres (**Figure 1-1 and 1-2**) and is composed of the following:

- 33.6 acres of planted pine forest, which may be harvested at a future date;
- 39.3 acres of commercial buildings (and maintained landscape) from west to east, as follows:
 - Combat Arms Building (Building 1265)
 - First Air Force Headquarters Complex (Buildings 1214, 1212, and 1210)
 - Former Air Control Squadron Building (Building 1270; demolition completed January 2013)
 - Area Defense Counsel Building (Building 1287)
 - Education Center (Building 1230)
- 1.11 acres of ephemeral wetlands; and
- 0.16 acre man-made pond (AECOM, March 2011).

Further description of the site, including its location and current land use, is presented in the following subsections.

A comprehensive description of the Site and historical background can be found in the Site-specific *Conceptual Site Model (CSM) for RI/FS, ERP Site ID FR038, Beacon Beach Skeet Range Operable Unit 15, Tyndall Air Force Base, Florida* (AECOM, May 2011) provided in Appendix B of the *Final Remedial Investigation/Feasibility Study Work Plan ERP Site ID FR038 (OU 15), Beacon Beach Skeet Range, Tyndall Air Force Base, Florida* (AECOM, April 2012), and subsequently referred to in this document as the RI/FS Work Plan. A copy of the RI/FS Work Plan is provided within the Reference Materials folder on compact disc (CD) attached to this report.

1.1.1 Site Location

The Site is located in the northwestern section of Tyndall AFB, approximately 2000 feet southwest of US Highway 98 and 2,000 feet northeast of St. Andrew Bay on the Gulf of Mexico (**Figure 1-1**). The site is bounded to the south by Beacon Beach Road, to the west by DeJarnette Drive, to the north by Bambi Trail, and to the east by the Gulf Power Substation and Cleveland Street (**Figure 1-2**).

1.1.2 Land Use and Land Use Controls

Currently, the land use for the Site, as designated by the Base General Plan (BGP; Black & Veatch, July 2004), is shown in **Figure 1-2** and includes Community Service, Training, and Open Space designations. In this case, the land use designation of “Training” represents administrative and office functions of training operations. The Education Center will consist primarily of overflow classrooms for training and other adult education.

Future land use at the Site is predominantly administrative, based on the Tyndall-1 Area Development Plan (Black & Veatch, August 2006). This plan does not deviate significantly from the current BGP, designating approximately half of the site to be used for administrative and operational activities, the southeast corner for community service, and the rest of the area designated as out-parcels for future development.

Interim Land Use Controls (LUCs) are currently in place at the Site, and are described in the Interim Land Use Controls Plan (LUCP; AECOM, March 2011). The LUCs stipulated by the Interim LUCP include the following:

- Access to the area is restricted, accomplished by land use designation and signage. Currently, site usage is restricted to commercial/industrial use only.
- Groundwater from the site is prevented from being used for irrigation or drinking water purposes, and installation of wells is restricted to allow only those for environmental monitoring purposes.
- Access to permanent surface water bodies on the site are posted with signs that indicate no fishing and all surface water bodies are closed.
- Any major development on or near the site requires a waiver from the Major Command for Tyndall AFB, and any minor construction or ground disturbing activities requires a base waiver, signed by the Base Civil Engineer.
- LUC inspections are to be performed on a quarterly basis.

1.2 PREVIOUS SITE INVESTIGATIONS AND REMOVAL ACTIONS

Information pertaining to previous Site investigations and removal actions performed at the Site may be found in Section 2.0 of the Site-specific CSM, (AECOM, April 2012).

1.3 HISTORICAL OCCURENCE, NATURE, AND EXTENT OF CONTAMINATION

The historical occurrence, nature, and extent of contamination can be found in Section 3.0 of the Site-specific CSM (AECOM, April 2012). Supplemental field investigation activities conducted at the Site between May 9 and 18, 2012 to refine the nature, and extent of contamination are described further in Section 1.4. The current occurrence, nature, and extent of contaminant source material and contaminated soil within the four development areas is presented in Section 1.5.

1.4 FIELD INVESTIGATION ANALYTICAL DATA SUMMARY

Field investigation activities were conducted by AECOM between May 9 and 18, 2012 to further refine the extent of Site contaminant source material (lead shot and clay pigeon fragments) and contaminated surface and subsurface soil within the four development areas. A photographic log documenting these field investigation activities is included in **Appendix A** (provided on CD). All activities were conducted in accordance with the RI/FS Work Plan (AECOM, April 2012) with the following exception:

- Plastic bags were used in place of the stainless steel mixing bowls specified in the RI/FS Work Plan (AECOM, April 2012) for soil sample collection. The collected soil samples were scooped into plastic bags and then sealed and agitated by hand to ensure more uniform mixing than could be achieved by using stainless steel mixing bowls.

Data collection within the four development areas included X-ray fluorescence (XRF) screening for lead, soil sieving for the presence of lead shot or clay pigeon debris, and soil sampling for definitive laboratory analyses from 136 soil boring locations collected at multiple depths for select metals and polynuclear aromatic hydrocarbon (PAH) analyses. The soil boring logs containing field screening data for the 136 locations are included as **Appendix B** (provided on CD). Field screening and soil sample boring locations are shown on **Figure 1-3**.

Initial field screening was performed using a portable XRF unit (Innov-X Alpha 4000) and 500 micron soil sieve. A total of 990 soil samples were collected at various depths from the 136 soil boring locations. Surface XRF exceedances are shown on **Figure 1-4**. All shaded areas denote XRF exceedances of 280 parts per million (ppm) or more in the surface soil (0-.5ft). Additional contour lines are shown for lead exceedances of EPA RSL and FDEP SCTLs for residential exposure from *Chapter 62-777* of the Florida Administrative Code (FAC) at 400 ppm and EPA RSLs for industrial soil at 800 ppm. (The FDEP SCTL for industrial soil is 1400 ppm, therefore the more stringent EPA RSL for industrial soil was used). Sample locations where lead shot and clay pigeon debris were observed are shown in **Figure 1-5** (Areas A, B, and D) and **Figure 1-6** (Area C).

In accordance with data quality objectives identified within the Final RI/FS Work Plan (AECOM, April 2012), Sections 11.5 and 17.2 and the decision logic diagrams provided in Figures 6 and 7, soil sample locations and depths that had XRF screening results above 280 ppm were assumed to be contaminated and were not submitted for laboratory analyses. The 280 ppm XRF screening level was recommended by FDEP during a 26 April 2011 project scoping meeting as a conservative screening value for lead using XRF. Similarly, all soil sample locations and depths that contained lead shot and/or clay pigeon debris with particle sizes larger than 500 microns were assumed to be contaminated and were not submitted for laboratory analysis. The selected sieve size of 500 microns was determined based on the grain-size distribution (medium-grained sand) of native site soils and the range of grit size used by avian species for digestion. XRF and lead and clay pigeon debris results for all soil boring locations are summarized for Areas A through D in **Tables 1-1 through 1-4**, respectively.

For the remaining sample locations and depths that did not meet the aforementioned screening criteria, discrete soil samples were submitted to Environmental Conservation Laboratories, Inc. in Orlando,

Florida for definitive laboratory analyses for contaminants most commonly found at small arms firing ranges (including shotgun skeet ranges) including the target metals antimony, arsenic, copper, iron, lead, tin, and zinc and PAHs. The associated analytical laboratory results for these samples are summarized in **Tables 1-5 through 1-8**, and the complete analytical laboratory data packages are contained in **Appendix C** (provided on CD). The data qualifiers used for **Tables 1-5 through 1-8** are explained in **Table 1-9**.

All soil samples that were not submitted to the laboratory for analysis and any excess soil taken from each soil boring location were placed into a 20 cubic yard (yd³) roll-off container. One Toxicity Characteristic Leaching Procedure (TCLP) sample was taken from the roll-off container for waste characterization. TCLP characterization results identified lead at 24.1 milligrams per liter (mg/L), which indicated that pre-treatment of the waste soils would be required. The TCLP result is included in Sample Delivery Group (SDG) A203226 in **Appendix C** (provided on CD).

1.4.1 Quality Control Summary

Data validation for all analytical laboratory data received was done in accordance with the RI/FS Work Plan. All analytical data were verified following the guidelines prescribed in Worksheet #34 of the Final RI/FS Work Plan. This was followed by data validation that included a review of the raw data as prescribed in Worksheets #35 and #36. Based on the outcome of the data verification and validation processes, a data usability assessment was conducted as prescribed in Worksheet #37.

Based on these aforementioned procedures, no data were rejected and all scoped samples were collected resulting in 100% completeness. No Quality Control excursions were encountered during the verification and validation of the May 2012 analytical data set. As a result, the analytical data associated with SDGs A202658, A202666, A202692, A202695, A202716, A202738, A202758, A202782, A202888, A202897, A202902, A202904, A202909, A202910, A202911, A202982, A202983, A202985, and A203226 are considered compliant and adequate for their intended use.

1.4.2 Investigation-derived Waste Management

Investigation-derived waste (IDW) generated during the May 2012 field activities was managed in accordance with the RI/FS Work Plan. Approximately 2,500 gallons of decontamination water was generated and disposed as non-hazardous waste by Liquid Environmental Solutions of Mobile, Alabama. In addition, approximately 15 tons of soil was containerized in a 20 yd³ roll-off container during soil sample processing. As previously indicated, TCLP waste characterization analyses on the soil IDW resulted in hazardous concentrations of lead within the soil IDW. The soil IDW was disposed at the Waste Management facility located in Emelle, Alabama.

1.4.3 Information Management

The environmental data that was collected in May 2012 was submitted in electronic format compatible with the Tyndall AFB Environmental Resources Program Information Management System (ERPIMS) and was performed in accordance with the RI/FS Work Plan. Data submission was in accordance with

the procedures and specifications outlined in the ERPIMS Data Loading Handbook, Tools X, Version 5.0 (AFCEE, December 2009).

1.5 CURRENT OCCURENCE, NATURE, AND EXTENT OF CONTAMINATION

The current occurrence, nature, and extent of contamination within the four development areas addressed in this EE/CA is based on the results of the May 2012 field investigation conducted by AECOM and is specific to surface and subsurface soil only. The nature and extent of potential leachability concerns for soil and potential dissolved groundwater contamination associated with the four development areas is not addressed in this EE/CA.

Screening limits for industrial use were selected using the more stringent value of the EPA RSL and Florida SCTL.

- Arsenic = 1.6 ppm (EPA RSL)
- Antimony = 370 ppm (Florida SCTL)
- Lead = 800 ppm (EPA RSL)
- PAHs = A combination of RSL and SCTL limits were used. EPA has screening criteria for each of the carcinogenic PAHs, while SCTL has a screening limit for B(a)P equivalent. Either criterion was used to determine exceedance.

The following is a summary of the current occurrence, nature, and extent of soil contamination by development area as it relates to industrial land use:

- **Area A:** XRF screening detected eight locations with exceedances of the EPA Industrial RSLs for lead (800 ppm). Thirteen soil sample locations that were submitted for laboratory analysis had detections above the EPA Industrial RSLs for PAHs. Only one soil sample location exceeded the EPA Industrial RSLs for arsenic, antimony and lead.
- **Area B:** No exceedances of the EPA Industrial RSL for lead were detected during XRF screening. No exceedances of the EPA Industrial RSL for lead or PAHs were detected in discrete soil samples submitted for analytical laboratory analyses. Only two discrete soil samples were determined to exceed the EPA Industrial RSL for arsenic in the southern portion of Area B.
- **Area C:** No exceedances of the EPA Industrial RSL for lead were detected during XRF screening. No exceedances of the EPA Industrial RSLs for target metals or PAHs were detected in discrete soil samples submitted for analytical laboratory analyses.
- **Area D:** XRF screening detected four locations with exceedances of the EPA Industrial RSL for lead. Twenty-eight analytical samples were found to exceed the EPA Industrial RSLs for PAHs, and two samples exceeded the EPA Industrial RSL for arsenic.

Analytical laboratory results for soil samples that exceeded the EPA Industrial RSLs (EPA, April 2012) and/or the Florida Industrial SCTLs (FDEP, April 2005) at the four proposed construction project areas are summarized in **Tables 1-10 through 1-12** and are shown on **Figures 1-7 through 1-9**. Five detections of arsenic above its EPA Industrial RSL were detected (one in Area A, two in Area B, and two

in Area D). Arsenic detections at the site could be related to shot pellets (added to lead shot to increase the surface tension), naturally-occurring, or as an element found in biological shell materials that are a component of the soil. With the exception of sample 30BH0651-1.0 in Area A, the distribution of arsenic across the four areas may indicate background levels of arsenic. However, sampling to determine a site-specific background arsenic concentration has not been completed. Without further investigation, these sample locations with exceedances of the EPA Industrial RSL for arsenic are considered as part of this EE/CA.

As with the screening limits for industrial use, the residential screening limits were selected using the more stringent value of the EPA RSL and Florida SCTL.

- Arsenic = 0.39 ppm (EPA RSL)
- Antimony = 27 ppm (Florida SCTL)
- Lead = 400 ppm (both EPA RSL and Florida SCTL)
- PAHs = A combination of RSL and SCTL limits were used. EPA has screening criteria for each of the carcinogenic PAHs, while SCTL has a screening limit for B(a)P equivalent. Either criterion was used to determine exceedance.

The following is a summary of the current source, nature, and extent of soil contamination by proposed construction project area as it relates to residential land use:

- **Area A:** XRF screening detected fifteen locations with exceedances of the EPA Residential RSL and/or SCTL for lead (400 ppm). Twenty-five soil sample locations that were submitted for laboratory analysis had detections above the EPA Residential RSL and/or SCTL for PAHs. Ten sample locations exceeded the EPA Residential RSL for arsenic, and one soil sample location exceeded the EPA Residential RSL and/or SCTL for antimony and lead. Lead or clay pigeon debris was found at thirty of the thirty-three total sample locations.
- **Area B:** No exceedances of EPA Residential RSL and/or SCTL for lead were detected during XRF screening. Five soil sample locations were found to exceed the Residential RSL for PAHs, and two soil sample locations exceeded the Residential RSL and/or SCTL for arsenic. Lead and/or clay pigeon debris was found at five of the ten total sample locations.
- **Area C:** No exceedances of Residential RSL and/or SCTL for lead were detected during XRF screening. No exceedances of the Residential RSL and/or SCTL for PAHs were detected in discrete soil samples submitted for laboratory analyses. Two soil sample locations were found to exceed the Residential RSL for arsenic. Lead shot was found at two of the three sample locations.
- **Area D:** XRF screening detected 17 soil sample locations with exceedances of the EPA Residential RSL and/or SCTL for lead. Sixty-one soil sample locations were found to exceed the EPA Residential RSL and/or SCTL for PAHs, and forty-seven soil sample locations exceeded the EPA Residential RSL and/or SCTL for arsenic. Lead and/or clay pigeon debris was found at seventy-nine of the ninety total sample locations.

Analytical laboratory results for soil samples that exceeded the EPA Residential RSLs (EPA, April 2012) and/or the Florida Residential SCTLs (FDEP, April 2005) at the four proposed construction project areas are summarized in **Tables 1-13 through 1-16** and are shown on **Figures 1-10 through 1-12**.

2.0 IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

Section 2.0 identifies the scope, purpose, and objectives for the potential NTCRA which may be conducted at the Site. In addition, the Applicable or Relevant and Appropriate Requirements (ARARs) for the potential NTCRA are identified.

2.1 SCOPE AND PURPOSE OF REMOVAL ACTION

The May 9 through 18, 2012 field investigation identified and defined contaminant source material (lead and clay pigeon fragments) and/or associated surface and subsurface soil contamination at the four development areas within the Site. Within the development areas, the concentration of lead, arsenic, antimony, and/or PAHs exceeded EPA RSLs (EPA, April 2012) and/or exceeded the Florida SCTLs (FDEP, April 2005). As a result of these exceedances, a potential risk to human health and the environment is present, and a removal action may be necessary to prevent, minimize, and mitigate the potential threat to public health, welfare, and the environment posed by these contaminants at these four areas.

2.2 REMOVAL ACTION OBJECTIVES

The primary goal of this EE/CA is to determine if a NTCRA is necessary to mitigate the potential threat to human health and the environment created by the presence of contaminant source material (lead shot and clay pigeon fragments) and contaminated soil at the four proposed construction project areas within the Site. If necessary, a NTCRA will consist of a response action to meet the following RAOs:

- Minimize direct exposure pathways (incidental ingestion, dermal absorption, and inhalation of airborne particulates) to Site-related contaminants identified in Site soil by human and ecological receptors;
- Attain Removal Action Levels (RALs)

The RALs proposed for the four construction project areas at the Site include the applicable EPA RSLs (EPA, April 2012) and Florida SCTLs (FDEP, April 2005) for lead, arsenic, antimony, and/or PAHs as dictated by current and anticipated future land use.

The EPA RSLs are not typically used as cleanup levels at CERCLA sites; the risk assessment process is frequently used to determine these levels. However, a remedial investigation report (including a baseline risk assessment) has not yet been developed at this site. A streamlined evaluation of the risk, focusing specifically on the soil contamination in the areas addressed in this EE/CA was used to establish cleanup levels in order to be adequately protective of potential receptors identified in the previous sections, and to comply with both relevant state regulations and CERCLA guidance. It was determined that the EPA RSLs and the Florida SCTLs would be sufficiently protective. Thus the lower of these two potential clean-up values was selected as the cleanup value to guide this NTCRA. Cleanup values for the final remedy for the FR038 site will be based upon a full risk assessment, and may vary from the values selected for this specific response action.

2.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENT-BASED GOAL

CERCLA Section 121 specifies that actions for cleanup of hazardous substances must comply with requirements or standards under federal or more stringent state environmental laws that are applicable or relevant and appropriate to the hazardous substances or particular circumstances at a Site. On-Site removal actions conducted under CERCLA are required to attain these ARARs to the extent practicable.

Categories of ARARs are defined as (1) chemical specific, (2) location specific, and (3) action specific.

1. Chemical-specific requirements set health or risk-based concentration/discharge limits in various media for specific hazardous substances, pollutants, or contaminants. These requirements set protective cleanup levels that may be incorporated when specifying a remedial activity.
2. Location-specific requirements establish restrictions based on concentrations of hazardous substances at special locations (e.g., wetlands, floodplains, etc).
3. Action-specific requirements include operation, performance, and design limitations or requirements based on waste types, media, and response actions.

Potential federal chemical-specific, state chemical-specific, and federal action-specific ARARs for the four Site development areas have been identified and are presented in **Tables 2-1 through 2-3**, respectively. There were no location-specific ARARs identified.

2.4 TO BE CONSIDERED

To Be Considered (TBC) requirements are advisories or guidance issued by Federal or State government that are not legally binding but are similar in form to required ARARs. These may be considered along with ARARs to assist with determining risk, removal action, and additional requirements. Refer to **Table 2-4** for a list of potential TBCs.

2.5 NTCRA NECESSITY DETERMINATION

As discussed in Section 1.0, adequate information was previously unavailable to prepare an EE/CA and develop removal action alternatives. This necessitated the completion of additional field investigation activities in May 2012 to further refine the Air Force's understanding of the occurrence, nature and extent of contaminants within the four development areas at the Site. An improved understanding of the occurrence, nature and extent of Site contaminants was essential in determining whether Site condition warranted a NTCRA to control the current level of exposure and risk to relevant Site receptors and achieve the RAOs or if site conditions as they currently exist meet the RAOs.

The necessity for a NTCRA for each Site development area was evaluated by the Air Force from July through September 2012. Based on the current and anticipated future industrial land use for the Site, the existing interim LUC program, and the results from the May 9 through 18, 2012 field investigation activities, the northern and southeast portions of development Area B (approximately 0.36 acres out of a total of 0.45 acres) and all of Area C achieve the RAOs under current conditions.

As a result, a NTCRA is not warranted to address Site contaminants in surface and subsurface soil within 0.36 acres of development Area B and all of development Area C. Consistent with current and anticipated future land use, no exceedances of EPA Industrial RSLs (EPA, April 2012) and/or Florida Industrial SCTLs (FDEP, April 2005) for lead, arsenic, antimony, and/or PAHs were detected within these particular areas as determined by definitive analytical laboratory analysis of discrete soil samples. Because EPA Residential RSL and/or Florida Residential SCTL exceedances in soil exist at both of these areas, the interim LUC program currently in place at the Site would apply.

Following the Air Force's evaluation of the May 2012 field investigation activities related to the four development areas, building expansion activities were completed for all of Area C in January 2013, and they are anticipated to begin on the northern and southeastern portions (approximately 0.36 acres) of Area B within the second quarter of 2013, with completion scheduled for July 2013. The decision to initiate development within Area B and Area C was determined on a case-by-case basis with Major Command authorization to proceed in accordance with the existing Interim LUC program. Site development activities within these areas are being conducted in accordance with the 325th Civil Engineering Squadron (CES) Project Management Office (PMO) *ERP Guidelines for Work on Tyndall AFB Contaminated Sites* (CES/PMO, October 2012). A copy of these guidelines is provided within the Reference Materials folder on CD attached to this report. In addition, site development activities (including management of any contaminated soil spoils) will comply with requirements and standards under federal and state environmental laws.

3.0 IDENTIFICATION AND EVALUATION OF REMOVAL ACTION ALTERNATIVES

The purpose of this section is to identify, screen, develop, and evaluate removal action alternatives that may be applicable for achieving the RAOs established in Section 2.0 for soil in the four designated development areas addressed by this EE/CA.

3.1 IDENTIFICATION OF POTENTIALLY APPLICABLE REMEDIATION TECHNOLOGIES FOR SOIL

This section identifies potentially applicable remediation technologies for the designated development areas addressed by this EE/CA based on Site-specific conditions and the soil contaminants that have been determined to be present. The EE/CA technology identification process is focused only on those technologies that have proven to be effective at similar Sites. Potentially applicable soil technologies were identified from a multitude of sources, including *Treatment of Lead-Contaminated Soil at the Pantex Site* (EPA, July 1999), *Presumptive Remedy for Metals-in-Soil Sites* (EPA, September 1999), *Characterization and Remediation of Soils at Closed Small Arms Firing Ranges* (Interstate Technology Regulatory Council [ITRC], January 2003), *Best Management Practices for Environmental Stewardship of Florida Shooting Ranges* (FDEP, October 2004), *Best Management Practices for Lead at Outdoor Shooting Ranges* (EPA, June 2005), *In Situ Treatment Technologies for Contaminated Soil* (EPA, November 2006), and *Corrective Action at Outdoor Shooting Ranges Guidance Document* (Colorado Department of Public Health and Environment, May 2012).

Selected technologies for soil were screened based on Site-specific effectiveness, technical implementability, and relative life-cycle cost. Those technologies that passed screening were used to develop removal action alternatives for soil at the development areas addressed by this EE/CA, and these alternatives are subjected to detailed analysis and comparison later in this document. Those technologies that were not effective, had implementation concerns, and/or were excessively expensive in comparison to other technologies were rejected from further evaluation.

The following soil remediation technologies were identified for consideration to achieve soil RAOs:

- LUCs;
- Containment/Covers;
- Excavation and Off-Site Disposal;
- Screening/Sieving
- Stabilization/Solidification; and
- Soil Flushing.

A description of the aforementioned soil remediation technologies for metal (primarily lead) and PAH contamination present in soil at the development areas addressed by this EE/CA is provided in Section 3.2.

3.2 DESCRIPTION OF POTENTIALLY APPLICABLE SOIL REMEDIATION TECHNOLOGIES

Soil remediation technologies identified in Section 3.1 are described further in the following subsections.

3.2.1 Land Use Controls

LUCs may include engineering or institutional controls. These can be legally binding and are administrative in nature. They are designed to protect human health and the environment. An Interim LUC Program as described in the Interim LUCP for the Site (AECOM, March 2011) is currently in place. Details related to the Interim LUCP are provided in Section 1.1.2 of this document.

Under the current interim LUC program, construction-based or remediation-based activity cannot occur at any of the four development areas at the Site without a waiver, which must be provided by Major Command or the Base Civil Engineer, as determined on a case-by-case basis. Access to the contaminated soil would be restricted while the interim LUCs remain in place.

3.2.2 Containment/Covers

Containment/Covers are engineered physical barriers placed between the impacted Site medium (i.e., soil) and the atmosphere and can include clean soil, sod, asphalt, or concrete to significantly reduce the risk to the public and the environment by preventing direct exposure to existing contaminants and also by preventing the migration of the existing contaminants and associated contamination. No matter the type of containment/cover, these items are subject to damage and thus require periodic surveillance and maintenance to ensure their long-term integrity and protectiveness.

3.2.3 Excavation and Off-Site Disposal

This technology involves mechanical removal of identified contaminant source material and contaminated soil. This material is excavated, stockpiled, and subsequently loaded into roll off containers. Alternatively, the excavated material may be placed directly into over-the road trucks with end dumps. The soil must be classified prior to commencement of disposal in order to determine what type of facility will accept it. As a result, the soil must be tested prior to disposal to determine its leachability (via TCLP). In order to be disposed as non-hazardous waste at a Subtitle D landfill, TCLP results for lead and arsenic concentrations must be below 5 mg/L, and PAH concentration results must meet the Underlying Hazardous Constituent (UHC) standards. UHC standards for soil are ten times the non-wastewater standards listed in 40 Code of Federal Regulation 268.48, Universal Treatment Standards Table. If the soil does not meet these criteria, it must either be treated to meet the TCLP and UHC criteria for Subtitle D landfill disposal, or it must be disposed in a Subtitle C landfill as hazardous waste. Based on the contaminant concentrations detected in soil during the May 2012 investigation (refer to Section 1.4), treatment may be required for soil excavated from any of the development areas in order to meet the requirements for disposal in a Subtitle D landfill.

3.2.4 Screening/Sieving

One technology that can be employed after soil excavation to minimize the potential for hazardous waste classification of the excavated soil is to use screening/sieving to remove lead shot and clay pigeon fragments contained within the impacted soil. The screening of the excavated soil for lead shot and clay pigeon fragments along with root and plant material, rocks, gravel, and sand can reduce the overall total volume of excavated soil requiring subsequent treatment and/or disposal, thereby reducing the total project cost. Recycling of the lead shot from the impacted soils (if deemed economically feasible) may reduce overall project cost as well as meet Tyndall AFB resource sustainability goals.

3.2.5 Solidification/Stabilization

This technology involves mixing a treatment agent such as Portland cement or a phosphate-based stabilization compound with the excavated soil to reduce contaminant solubility, to decrease the exposed contaminant surface areas, and to reduce matrix porosity and permeability. This process ultimately reduces the potential for the contaminant to be exposed to fluids that could transfer it out of the soil and into surface water and/or groundwater. After appropriate testing to ensure effective treatment to meet the land disposal restriction standards, the non-hazardous, stabilized soil may be transported and disposed at a permitted Subtitle D landfill. Prior to stabilizing the contaminated soil, a bench-scale treatability study would need to be performed to determine the appropriate dose rate and reagent mixture to successfully meet the established performance standards (e.g., obtain approval for disposal of soil at Subtitle D landfill; ITRC, January 2003). Chemicals/substances added to the soil during stabilization will increase the weight of the soil by an assumed 5 percent; however, this process will not add to the volume of soil to be treated beyond standard soil fluffing (assumed to be 20 percent) caused by excavation and handling.

3.2.6 Soil Flushing

Soil flushing is an in situ technique that involves the flooding of a zone of contaminated soil with a specific chemical solution; the goal of using the chemical solution is to ultimately remove the contaminant(s) by emulsion, solubilization, or other chemical reaction. After passing through the contaminated soil, the chemical solution containing the contaminant(s) is collected and brought to the surface for subsequent on-Site treatment and reinjection, recirculation, and/or disposal. The successful application of soil flushing relies on the ability to adequately deliver the chemical solution, to contact the targeted contaminant(s), to control the flow, and to recover the flushing fluid and chemical contaminant(s). Flushing is most efficient in relatively homogenous and permeable soils (hydraulic conductivity less than 10^{-3} centimeters per second; (EPA, November 2006).

Before implementing soil flushing, laboratory and bench-scale treatability testing are necessary to ensure the selection of an agent(s) best suited for the contaminant(s) and the Site-specific soil and geochemical conditions. Modeling is also required to ensure the most efficient delivery system as well as to ensure the complete extraction of all mobilized contaminant(s) and flushing solution.

Because soil flushing can be customized to extract specific contaminants, it is hard to implement on soil that contains multiple dissimilar contaminants such as lead and PAHs (FDEP, October 2004). For example, a basic solution is most often used for lead removal, but a surfactant would most likely be used For PAHs. (EPA, November 2006). Major concerns with soil flushing at this Site include the difficulty in handling two different chemical solutions and the potential for mobilizing contamination beyond the point(s) of collection, thereby causing spreading and migration of the targeted contamination.

3.2.7 Results of Technology Screening

Table 3-1 presents the results of the technology screening for soil including general effectiveness, implementability, and cost. LUCs, containment/cover, excavation and off-Site disposal, screening or sieving, and solidification/stabilization are retained for consideration in developing soil removal action alternatives for the four designated development areas at the Site. Soil flushing was eliminated from alternative consideration because of concerns related to achieving sufficient contact with the targeted contaminants, the need for multiple chemical solutions to be used to treat both lead and PAHs, and concerns related to ensuring sufficient capture of the injected chemical solutions and targeted contaminants such that contaminant migration into the underlying groundwater does not occur.

3.3 DEVELOPMENT AND EVALUATION OF REMOVAL ACTION ALTERNATIVES

The technologies retained in Section 3.2.7 are combined, as applicable, to form alternatives to meet the RAOs established in Section 2.2. A limited number of alternatives have been developed, and they are intended to represent the full range of possibilities for the restoration of the development areas addressed by this EE/CA.

Three alternatives have been developed in this EE/CA, and each alternative is evaluated based on effectiveness, implementability, and cost. The effectiveness criterion refers to its ability to meet the established RAOs and to comply with ARARs and other criteria while minimizing or eliminating any short-term or long-term risk to human health and the environment during implementation. The implementability criterion addresses the technical and administrative feasibility of implementing the alternative and the availability of various services and materials required during its implementation. Finally, each removal action alternative is evaluated to determine its relative cost (EPA, August 1993). Cost estimates for the alternatives presented are for comparison purposes only, are order-of-magnitude level, and have an estimated range of accuracy of -30% to +50%. It is assumed that NTCRA activities (if required) at the designated development areas would be completed within a one year time period; however, because interim LUCs have been established for the Site, present worth costs for each alternative except Alternative 3 are determined over a 30-year time period at a 3% discount rate.

A description and evaluation for each of the three alternatives that are developed in this EE/CA are presented in the following subsections. Note that Alternatives 2 and 3 are split into an “A” and a “B” scenario; the difference between the A and B scenarios is related to the type of disposal facility (i.e., Subtitle C landfill versus Subtitle D landfill) that will receive the removed lead shot, clay pigeon fragments, and contaminated soil.

3.3.1 Alternative 1: No Action/Land Use Controls

The No Action alternative serves as a baseline against which all other developed alternatives will be compared. An interim LUC program is currently in place at the Site, and under Alternative 1, this program would be continued. Details of the LUCs for the Site are contained in the Interim LUCP (AECOM, March 2011). The purpose of the LUC program is to limit human exposure and to protect human health and the environment by restricting activity, use, and access to residual contamination present at the Site.

3.3.1.1 Effectiveness

Using the RAOs established in Section 2.2 and the CERCLA EE/CA guidance criteria (EPA, August 1993), the effectiveness of Alternative 1 is evaluated below.

Achievement of Removal Action Objectives. This alternative would meet the objective of minimizing direct exposure pathways by human and ecological receptors to contaminants identified in soil at the development areas; however, it may not attain either industrial or residential RALs. Waste streams would not be generated under this alternative.

Overall Protectiveness of Public Health and the Environment. Alternative 1 would reduce but not eliminate the risk to human health by limiting direct exposure to contaminant source material (lead shot and clay pigeon fragments) and contaminated soil via LUCs. Because contaminant source material and contaminated soil would remain above screening criteria at the four development areas, the potential for direct exposure would exist. Personnel working at the Site could potentially be exposed to existing contamination by walking through and/or parking in contaminated areas. No monitoring other than quarterly LUC surveillance would be performed to ensure that the risk posed by exposure to soil contaminants identified in the development areas had not increased.

Compliance with ARARS and Other Criteria, Advisories, and Guidance. The identified ARARs for this EE/CA do not apply to Alternative 1; therefore, there are no compliance issues.

Reduction of Toxicity, Mobility, Volume Through Treatment. There would be no reduction of toxicity, mobility, or volume through treatment, as no treatment would occur under Alternative 1.

Short-Term Effectiveness. Because LUCs already exist at the Site, the short-term effectiveness is moderate for limiting human exposure and limiting risk to human health and protection of the community and workers. Because contaminant source material and contaminated soil would remain at the four development areas, the potential for direct exposure would exist.

Long-Term Effectiveness and Permanence. If the LUCs are maintained, the long-term effectiveness of this alternative would be moderate for limiting human exposure and limiting the risk to human health. Because contaminant source material and contaminated soil will remain in place, personnel working at the Site could potentially be exposed to existing contamination by walking through and/or parking in contaminated areas.

3.3.1.2 Implementability

Technical Feasibility. Alternative 1 is technically feasible, as it does not require any new action or technology.

Administrative Feasibility. This alternative is also administratively feasible, as the required administration for the LUCs is already in place, and minimal coordination with other offices and agencies would be necessary. No off Site permits or waivers would be required.

Availability of Services and Materials. Personnel and materials needed to conduct LUC monitoring are minimal and readily available. Maintenance and/or replacement of signage is required by the Interim LUCP for the Site (AECOM March, 2011), which is implementable, as the signage is already in place and being maintained.

3.3.1.3 Cost

The cost for Alternative 1 consists of quarterly LUC monitoring. The quarterly LUC monitoring event includes a Site visit that is followed up with completion of a LUC Surveillance Report to document the condition of Site LUCs and also determines if any action needs to be taken to maintain the LUCs. A small cost associated with sign maintenance and repair has also been included. Costs for this alternative include LUC monitoring for the next 30 years. The 30-year present worth cost of Alternative 1 is \$53,000. **Table 3-2** summarizes costs associated with Alternative 1; the detailed cost estimate for Alternative 1 is presented in **Appendix D-1**.

3.3.2 Alternative 2A/2B: LUCs, Excavation to Industrial RSLs, and Disposal

Under Alternative 2, the interim LUC program currently in place at the Site that was previously described for Alternative 1 would be continued.

Alternative 2 would also include the excavation and disposal of all contaminated soil that was found to exceed applicable EPA Industrial RSLs for lead, arsenic, antimony and/or PAHs at the development areas addressed by this EE/CA. The estimated quantity of soil to be excavated from each of the development areas under Alternative 2 was calculated using a computer-aided design (CAD) model that incorporated all XRF and analytical laboratory soil sample results from the May 2012 field investigation activities. Based on the inputted information, the vertical excavation depths within each area were set by using the deepest sample depths at which contamination above the EPA Industrial RSLs (EPA, April 2012) and/or the Florida Industrial SCTLs (FDEP, April 2005) was detected. For sample locations where no confining clean samples were detected, the vertical excavation depth was conservatively set in the CAD model to the approximate depth of the Site water table (assumed to be 4 feet). The lateral excavation extent within each area was set to be halfway between a contaminated sample point and the next adjacent clean sample point in all directions. Confirmation soil sampling would be performed during excavation activities to verify that industrial land use standards have been met.

Once the soil volumes to be excavated from each area were estimated by the CAD model, a soil fluffing factor of 20 percent was added to the quantity of soil to be transported to compensate for volume increase as a result of soil excavation and handling activities under Alternative 2.

The estimated quantity of soil to be excavated under Alternative 2 by Area is 11,529 yd³ as follows:

- Area A: 4,260 yd³.
- Area B: 463 yd³.
- Area D: 6,806 yd³.

Note that the quantity of soil estimated for Area B pertains to the 0.11 acres of this development area that will not be made into a parking lot as of the second quarter of 2013 as previously described in Section 2.5.

Figure 3-1 shows the excavation areas and associated depth contours generated by the CAD model for Alternative 2. It is assumed that a vacuum rig would be required to remove a portion the soil located adjacent to the building in Area D under both Alternative 2A and 2B.

Under Alternative 2A, the excavated soil from each area would be classified as hazardous waste and subsequently transported to the closest hazardous waste (Subtitle C) landfill for disposal. Under Alternative 2B, the excavated soil from each area would be sifted to remove lead shot and clay pigeon fragments and then the remaining soil would be stabilized prior to disposal in a Subtitle D landfill. The sifted fragments would be disposed of as necessary, with the potential for recycling of the lead pellets.

For cost estimating, a soil bulking factor of five percent by weight to compensate for addition of stabilization compounds was assumed based on the recommendation of a stabilization vendor. Also, it was conservatively assumed that no reduction in volume/weight of the excavated soil would result from the removal of the lead shot and clay pigeon fragments.

3.3.2.1 Effectiveness

Using the RAOs established in Section 2.0 and the CERCLA EE/CA guidance criteria (EPA, August 1993), the effectiveness of Alternative 2 is evaluated below.

Achievement of Removal Action Objectives. Alternative 2, which would include excavation of soil that contains contaminant exceedances of the RAL for industrial land use, would fully meet the RAOs established in Section 2.0..

Overall Protectiveness of Public Health and the Environment. Alternative 2 would reduce the risk to human health and the environment by limiting exposure to contaminant source materials (lead shot and clay pigeon debris) and contaminated soil during NTCRA activities by removal of all soil exceeding EPA Industrial RSLs and/or Florida Industrial SCTLs, and by the continuation of LUCs. However, contaminated soil would remain in place above residential standards under this alternative. LUCs and soil removal are effective ways to reduce the transport of contaminants above and below ground. Quarterly

LUC surveillance would be continued to ensure that the risk posed by exposure to remaining contamination at the Site does not increase.

Compliance with ARARS and Other Criteria, Advisories, and Guidance. An ARAR detailing the Occupational Health and Safety Administration (OSHA) requirements for NTCRA workers in the field potentially applies to this alternative. Personnel responsible for oversight of removal activities would also be subject to those OSHA requirements. ARARs are also included that apply to characterization, storage, transport, and disposal of hazardous materials and waste. These would apply to this alternative, as the soil excavated potentially would be characterized as hazardous waste. Provisions for meeting these ARARs would be included in the work plan and health and safety plan developed for Alternative 2.

Reduction of Toxicity, Mobility, Volume Through Treatment. This alternative would be effective at significantly reducing the toxicity, mobility, and volume of contaminants identified at the development areas based on the soil excavation that would be performed; however, some contaminated soil above residential standards would be left in place.

Short-Term Effectiveness. The established interim LUCs for the Site would effectively limit human exposure and risk to human health and also afford protection of the community and workers in the short term. An inherent short-term risk would be associated with the excavation and handling of the contaminated soils, and shipment of the excavated material over public roadways if it is determined to be hazardous. The short-term risk of an accident related to the shipment of the excavated material would be proportional to the number of trip-miles required to complete all removal action-related activities.

Long-Term Effectiveness and Permanence. The long term effectiveness of this alternative would be high since contaminated soil with concentrations above the EPA Industrial RSLs and/or Florida Industrial SCTLs and contaminant source material would be removed and properly disposed. Additionally, the continuation of LUCs currently in place at the development areas would add to the long-term effectiveness. Furthermore, the selected offsite disposal facility would be an existing, permitted Subtitle C or Subtitle D landfill. The landfill would operate under the restrictions of its specific operating permit, thereby ensuring the long-term effectiveness of the disposal option for the excavated soil.

3.3.2.2 Implementability

Technical Feasibility. Alternative 2 is technically feasible, as soil excavation is an accepted and commonly used method of removal and does not involve any advanced technology. Alternative 2B includes sifting and stabilization which are both commonly used and feasible methods of restricting the leachability of contaminants in excavated soil.

Administrative Feasibility. Alternative 2 is also administratively feasible. The required administration for LUCs at the Site is already in place. Excavation and treatment of the removed soil would require a contractor and oversight for operations would be necessary. Off-site permits for disposal in a Title C landfill could be required, including a waste profile, backed by analytical results. Based on the estimated

volume of soil to remove and the fact that Base access is restricted, extensive coordination between the transportation contractor and Tyndall AFB would be necessary.

Availability of Services and Materials. LUC monitoring is already being conducted. Maintenance of signage is required for the LUCs (AECOM March, 2011) is implementable, as the signage is already in place and being maintained. Additionally, the contractors required for soil excavation and disposal are readily available. Treatment of the excavated soil via sifting and stabilization, if required, necessitates a more specialized form of service and materials from a pool of contractors that is much more limited in number; however, has been confirmed that a limited number of these contractors are available to perform this type of work in Florida.

3.3.2.3 Cost

The 30-year present worth costs of Alternatives 2A and 2B are estimated to be \$3,540,000 and \$2,580,000, respectively. This includes a total first year capital cost of \$3,490,000 for Alternative 2A and \$2,530,000 for Alternative 2B. First year capital costs for Alternative 2 include preparation of a health and safety plan and work plan, soil excavation, transportation and disposal, and the generation of a NTCRA Summary Report. **Tables 3-3 and 3-4** summarize the costs associated with Alternative 2A and 2B respectively; detailed cost estimates for Alternative 2A and 2B are presented in **Appendix D-2A and D-2B**, respectively.

3.3.3 Alternative 3A/3B: Excavation to Residential RSLs, and Disposal

Alternative 3 will include the excavation and disposal of all contaminated soil that was found to exceed applicable EPA Residential RSLs for lead, arsenic, antimony and/or PAHs at the four development areas addressed by this EE/CA. It would also include the LUC components that were previously described for Alternative 2, but only until completion of the removal of all EPA Residential RSL exceedances, at which time LUCs would no longer be required.

The estimated quantity of soil to be excavated from each of the project areas under Alternative 3 was calculated using a CAD model that incorporated all XRF and analytical laboratory soil sample results from the May 2012 field investigation activities. Based on the inputted information, the vertical excavation depths within each area were set by using the deepest sample depths at which contamination above the EPA Residential RSLs (EPA, April 2012) and/or the Florida Industrial Soil Cleanup Target Levels (SCTLs; FDEP, April 2005) were detected. For sample locations where no confining clean samples were detected, the vertical excavation depth was conservatively set in the CAD model to the approximate depth of the Site water table (assumed to be 4 feet). The lateral excavation extent within each proposed construction area was set to be halfway between a contaminated sample point and the next adjacent clean sample point in all directions. Confirmation soil sampling would be performed during excavation activities to verify that residential land use standards were met.

Once the soil volumes to be excavated from each area were estimated by the CAD model, a soil fluffing factor of 20 percent was added to the quantity of soil to be transported to compensate for volume increase as a result of soil excavation and handling activities under Alternative 3.

The estimated quantity of soil to be excavated under Alternative 3 by Area is as follows:

- Area A: 5,732 yd³
- Area B: 667 yd³
- Area C: 346 yd³
- Area D: 18,927 yd³

Figure 3-2 shows the excavation areas and associated depth contours generated by the CAD model for Alternative 3.

Note that the quantity of soil to be excavated is provided for Area C under Alternative 3 even though this area has been previously covered by the expansion of the Education Center in January 2013 as described in Section 2.5. This quantity of soil is provided because the exceedance of the EPA Residential RSLs and/or the Florida SCTLs detected within Area C would need to be removed in order to meet residential land use standards. Ultimately, this would necessitate the removal of the Education Center expansion. In addition, a greater quantity of soil to excavate at Area B is shown for Alternative 3 when compared to Alternative 2 because a portion of Area B where the parking lot will be installed during the second quarter of 2013 would need to be removed in order to excavate soil contamination detected in excess of the EPA Residential RSLs and/or the Florida SCTLs beneath the parking lot. A vacuum rig is assumed to be required to remove a portion the soil located adjacent to the building in Area D under both Alternative 3A and 3B.

Under Alternative 3A, the excavated soil from each area would be classified as hazardous waste and subsequently transported to the closest hazardous waste (Subtitle C) landfill for disposal. Under Alternative 3B, the excavated soil from each area would be sifted to remove lead shot and clay pigeon fragments and then stabilized and disposed in a Subtitle D landfill. The sifted fragments would be disposed of as deemed necessary, with the potential for recycling of the lead pellets.

For cost estimating, a soil bulking factor of five percent by weight to compensate for addition of stabilization compounds was assumed based on the recommendation of a stabilization vendor. Also, it was conservatively assumed that no reduction in volume/weight of the excavated soil would result from the removal of the lead shot and clay pigeon fragments.

3.3.3.1 Effectiveness

Using the RAOs established in Section 2.2 and the CERCLA EE/CA guidance criteria (EPA, August 1993), the effectiveness of Alternative 3 is evaluated below.

Achievement of Removal Action Objectives. Alternative 3 would fully meet all of the RAOs established in Section 2.2.

Overall Protectiveness of Public Health and the Environment. Alternative 3 would reduce the risk to human health and the environment by eliminating exposure to contaminant source materials (lead shot and clay pigeon debris) and contaminated soil through the removal of all soil exceeding EPA Residential RSLs and/or Florida Residential SCTLs.

Compliance with ARARS and Other Criteria, Advisories, and Guidance. An ARAR detailing the OSHA requirements for NTCRA workers in the field potentially applies to this alternative. Personnel responsible for oversight would also be subject to those OSHA requirements. ARARs are included that apply to characterization, storage, transport and disposal of hazardous materials and waste. These would apply to this alternative, as the soil excavated potentially would be characterized as hazardous waste. Provisions for meeting these ARARs must be included in the work plan and health and safety plan for the removal action.

Reduction of Toxicity, Mobility, Volume Through Treatment. This alternative would effectively eliminate toxicity, mobility, and volume of contaminants in the four development areas due to soil excavation activities.

Short-Term Effectiveness. Continuation of the LUCs already established for the Site and soil excavation would be effective in the short-term for limiting human exposure and risk to human health and the environment and also for protection of the community and workers. LUCs would only be necessary until the completion of source material and contaminated soil removal activities. An inherent short-term risk would be associated with the excavation and handling of the contaminated soils, and the shipment of the excavated material over public roadways if it is determined to be hazardous. The short-term risk of an accident related to the shipment of the excavated material would be proportional to the number of trip-miles.

Long-Term Effectiveness and Permanence. The long term effectiveness of this alternative would be high since the contaminated soil at the four designated areas with concentrations above the EPA Residential RSLs and/or Florida Residential SCTLs and all contaminant source material would be removed and properly disposed. Additionally, the selected offsite disposal facility would be an existing, permitted Subtitle C or Subtitle D landfill. The landfill would operate under the restrictions of its specific operating permit, thereby ensuring the long-term effectiveness of the disposal option for the excavated soil.

3.3.3.2 Implementability

Technical Feasibility. Alternative 3 is technically feasible, as the implementation of LUCs as well as soil excavation does not involve any unusual technology. The removal of the Education Center expansion at Area C and a portion of the completed parking lot at Area B would be necessary in order to access and remediate EPA Residential RSL and Florida Residential SCTL exceedances; this would add to the technical complexity of Alternative 3. Alternative 3B includes treatment of the excavated soils (sifting and stabilization) which is a commonly used and feasible method of reducing the leachability of contaminants in excavated soil, thereby allowing them to be disposed as solid waste in a Subtitle D landfill.

Administrative Feasibility. Alternative 3 is also administratively feasible. The required administration for the LUCs is already in place and would not require extensive administration or coordination with other offices or agencies. Off-site permits for disposal in a Subtitle C landfill could be required, including a waste profile, backed by analytical results. Due to the quantity of soil being removed and the fact that Base access is restricted, extensive coordination between the selected transportation contractor and Tyndall AFB would be necessary.

Availability of Services and Materials. LUC monitoring is already being conducted. Maintenance of signage is required for the LUCs (AECOM March, 2011) but is implementable, as the signage is already in place and being maintained. LUCs would only be necessary until completion of NTCRA activities. The contractors required for soil excavation and disposal are readily available. Treatment of the excavated soil via sifting and stabilization, if required, necessitates a more specialized form of service and materials from a pool of contractors that is much more limited in number; however, it has been confirmed that a limited number of these contractors are available to perform this type of work in Florida.

3.3.3.3 Cost

The present worth costs of Alternatives 3A and 3B are estimated to be \$7,710,000 and \$5,480,000, respectively. Note that costs to remove the expansion to the Education Center at Area C and portions of the completed parking lot at Area B to address detected EPA Residential RSL and Florida Residential SCTL exceedances in soil are included as part of this cost summary. While technically feasible, the removal of the aforementioned areas to address the associated residential exceedances in soil is not cost effective. **Tables 3-5 and 3-6** summarize the costs associated with Alternative 3A and 3B respectively; detailed cost estimates for Alternative 3A and 3B are presented in **Appendix D-3A and D-3B**, respectively.

4.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

A criterion by criterion comparative analysis of the three NTCRA alternatives developed in Section 3.3 is presented in the following subsections. The purpose of this comparative analysis is to identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs that would affect the removal action selection can be identified. Comparisons of the three alternatives are summarized in **Table 4-1**.

4.1 ACHIEVEMENT OF REMOVAL ACTION OBJECTIVES

Alternative 1 does not fully meet the RAOs established in Section 2.2 while Alternatives 2 and 3 do fully meet the RAOs for industrial and residential use, respectively.

Alternative 1 minimizes direct exposure pathways only through the continuation of interim LUCs that are currently in place at the Site. While this is an effective method, Alternatives 2 and 3 would limit direct exposure pathways to a greater degree than Alternative 1 via the removal of various quantities of contaminant source material and contaminated soil.

Alternatives 2 and 3 effectively remove contaminated soil from the development areas to attain Industrial and Residential RALs, respectively.

4.2 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The three alternatives developed for this EE/CA are protective of human health and the environment to varying degrees. As stated in the RAOs, the primary goal of the NTCRA is to mitigate the potential threat to human health and the environment caused by the presence of contaminant source material and contaminated soil that exists at the four designated development areas. The primary threat to human health and the environment is via direct exposure pathways including inhalation of airborne particulates, dermal absorption, and incidental ingestion.

Alternative 1 would reduce but not eliminate the risk to human health and the environment by limiting direct exposure to contaminant source material (lead shot and clay pigeon fragments) and contaminated soil through interim LUCs currently in place at the Site. Because contaminant source material and contaminated soil would remain as it currently exists at the four designated development areas, the potential for direct exposure would always be present. Personnel working at the Site could potentially be exposed to existing contamination by walking through and/or parking in contaminated areas.

Alternatives 2 and 3 provide greater protection of human health and the environment than Alternative 1 because varying quantities of contaminant source material and contaminated soil would be excavated and disposed off Site. Alternative 3 would be more protective than Alternative 2 because it would remove all contaminated soil that exists above EPA Residential RSLs and/or Florida Residential SCTLs from each of the four designated development areas.

4.3 COMPLIANCE WITH ARARs AND OTHER CRITERIA, ADVISORIES AND GUIDANCE

All alternatives potentially comply with ARARs and other criteria. Alternatives 2 and 3 comply with the EPA RSLs (EPA, April 2012) and the Florida SCTLs (FDEP, April 2005) which are included in the TBCs (Table 2-4).

4.4 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

Alternative 1 does not reduce toxicity, mobility, or volume of contaminants present at the four development areas. Alternative 2 would be more effective than Alternative 1, as it would significantly reduce the volume of contaminants identified at the four development areas based on the soil excavation activities that would be performed. Industrial land use standards would be achieved by Alternative 2; however, contaminated soil above residential standards would remain in place under this alternative. Alternative 3 would reduce toxicity and volume of contaminants to the greatest extent of the three alternatives.

4.5 SHORT-TERM EFFECTIVENESS

All alternatives provide some short-term effectiveness, the least of which is Alternative 1. Alternatives 2 and 3 provide roughly equal short-term effectiveness. Existing LUCs remaining in place during excavation and disposal activities would effectively limit human exposure and risk to human health and also afford protection to the community. LUCs would no longer be necessary following the completion of all removal activities under Alternative 3, but continue under Alternative 1 and 2. Alternatives 2 and 3 introduce inherent short-term risk due to transport of the excavated materials over public roads for disposal.

4.6 LONG-TERM EFFECTIVENESS

All alternatives provide some long-term effectiveness, the least of which is Alternative 1, which only includes LUCs. The long-term effectiveness of Alternatives 2 and 3 is greater than Alternative 1 because contaminant material and contaminated soil is removed as part of these alternatives. Alternative 3 provides the greatest long-term effectiveness, as contaminated soil above EPA Residential RSLs and/or Florida Residential SCTLs would be removed.

4.7 TECHNICAL FEASIBILITY

The three alternatives are technically feasible. Alternative 1 is the most feasible based on the fact that an interim LUC program is already in place for the Site, and it does not require any other actions. From a technical feasibility standpoint, Alternative 3 is the most difficult to implement because removal of a portion of the completed parking lot at Area B and the removal of the Education Center expansion would be necessary in order to address the EPA Residential RSL and/or Florida Residential SCTL exceedances detected within both areas.

4.8 ADMINISTRATIVE FEASIBILITY

The three alternatives are administratively feasible. The most feasible is Alternative 1, due to the fact that no further coordination, personnel, or processes would be involved. Alternatives 2 and 3 have the same relative degree of administrative feasibility. Alternatives 2 and 3 would require administrative coordination related to the transportation of excavated soils off base and to a designated disposal facility. Alternative 3 would require the most coordination because the estimated quantity of excavated soil is significantly greater than the quantity estimated for Alternative 2. In addition, a portion of the completed parking lot at Area B and the expansion at the Education Center at Area C would need to be removed in order to excavate the EPA Residential RSL and/or Florida Residential SCTL exceedances.

4.9 AVAILABILITY OF SERVICES AND MATERIALS

Services and materials are readily available for all three alternatives. Alternatives 2 and 3 would require a greater degree of services and materials as compared to Alternative 1. For Alternatives 2B and 3B, excavated soil requires treatment prior to disposal, so a specialized contractor would be necessary. The number of these specialized contractors is limited; however, several contractors have been identified that have performed this type of work in Florida.

4.10 COST

The three alternatives range in cost from the least expensive alternative (Alternative 1) to the most expensive alternative (Alternative 3). The 30-Year Present Worth Costs by Alternative are as follows:

- Alternative 1: \$53,000;
- Alternative 2A: \$3,540,000;
- Alternative 2B: \$2,580,000;
- Alternative 3A: \$7,710,000; and
- Alternative 3B: \$5,480,000.

5.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE

As stated in Section 2.0, the primary goal of this EE/CA is to determine if a NTCRA is necessary to mitigate the potential threat to human health and the environment created by the presence of contaminant source material (lead shot and clay pigeon fragments) and contaminated soil at the four proposed project areas within the Site. The primary threat to human health and the environment is through direct exposure pathways including inhalation of airborne particulates, dermal absorption, and incidental ingestion.

Based on a comprehensive assessment and comparison of the three NTCRA alternatives developed within this EE/CA, Alternative 2, LUCs, Soil Removal to EPA Industrial RALs and Florida Industrial SCTLs, and Disposal, is recommended to address the RAOs for the four designated development areas.

Alternative 1 would not achieve the applicable RAOs developed in Section 2.2. It would continue the existing reduction of, but not reduce further, the risk to human health and the environment by limiting direct exposure to contaminant source material (lead shot and clay pigeon fragments) and contaminated soil through the interim LUC program that is currently in place at the Site. Because contaminant source material and contaminated soil would remain as it currently exists at the four development areas, the potential for direct exposure would always be present. Personnel working at the Site could potentially be exposed to existing contamination by walking through and/or parking in contaminated areas.

To varying degrees, Alternative 2 and 3 both address the primary potential threat to human health and the environment that is posed by direct exposure to contaminant source material and contaminated soil that is present at the development areas. Through a combination of soil excavation to EPA Industrial RSLs and Florida Industrial SCTLs followed by LUCs, Alternative 2 is more effective than Alternative 1, but it is not as effective as Alternative 3 at minimizing the potential direct exposure threat to human health and the environment.

Unlike Alternative 1, Alternatives 2 and 3 would attain RALs. Alternative 2 would attain the Industrial RALs (i.e., EPA Industrial RSLs [EPA, April 2012] and FDEP Industrial SCTLs [FDEP, April 2005]) while Alternative 3 would attain the Residential RALs (i.e., EPA Residential RSLs [EPA, April 2012] and FDEP Residential SCTLs [FDEP, April 2005]); however, the estimated cost to meet this RAO via Alternatives 2 and 3 is significant. Alternative 3 would require substantially more removal and disposal of contaminated soil when compared to Alternative 2. In addition, the removal of portions of the completed parking lot at Area B and the removal of the expansion of the Education Center at Area C would be necessary in order to achieve Residential RALs further complicating and adding to the cost of Alternative 3.

Because the current and anticipated future land use for the Site is industrial, Alternative 2 is the recommended NTCRA alternative for this Site.

Modifications made to the draft EE/CA, revision 0, dated December 2012 to transition the document to Revision 1, including regulatory correspondence, are documented in **Appendix E**.

6.0 REFERENCES

- AECOM Technical Services, Inc., March 2011. *Interim Land Use Controls Plan.*
- AECOM Technical Services, Inc., March 2012. *Approval Memorandum to Perform Engineering Evaluation/Cost Analysis for Proposed Non-Time Critical Removal Action.*
- AECOM Technical Services, Inc., April 2012. *Final Remedial Investigation/Feasibility Study Work Plan ERP Site ID FR038 (OU 15), Beacon Beach Skeet Range, Tyndall Air Force Base, Florida.*
- Air Force Center for Engineering and the Environment (AFCEE), December 2009. *ERPIMS Data Loading Handbook, Tools X, Version 5.0.*
- Black & Veatch. July 2004. *General Plan, Tyndall Air Force Base Florida.*
- Black & Veatch, August 2006. *Tyndall-1 (T-1) Area Development Plan.*
- Civil Engineering Squadron (CES)/Project Management Office (PMO), October 2012. *ERP Guidelines for Work on Tyndall AFB Contaminated Sites.*
- Colorado Department of Public Health and Environment, May 2012. *Corrective Action at Outdoor Shooting Ranges Guidance Document.*
- Environmental Protection Agency, August 1993. *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, EPA540-R-93-057.*
- Environmental Protection Agency, July 1999. *Treatment of Lead-Contaminated Soil at the Pantex Site.*
- Environmental Protection Agency, September 1999. *Presumptive Remedy for Metals-in-Soil Sites.*
- Environmental Protection Agency, June 2005. *Best Management Practices for Lead at Outdoor Shooting Ranges.*
- Environmental Protection Agency, November 2006. *In Situ Treatment Technologies for Contaminated Soil.*
- Environmental Protection Agency, April 2012. *Regional Screening Level Tables.*
- Florida Department of Environmental Protection, October 2004. *Best Management Practices for Environmental Stewardship of Florida Shooting Ranges.*
- Florida Department of Environmental Protection, April 2005. *Contaminant Cleanup Target Levels for Soil and Groundwater, Chapter 62-777, Florida Administrative Code.*

Interstate Technology Regulatory Council, January 2003. *Characterization and Remediation of Soils at Closed Small Arms Firing Ranges.*

Tyndall Air Force Base, October 2012. *Environmental Restoration Program Guidelines for Work on Tyndall AFB Contaminated Sites.*

TABLES

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0641-0.5	0	0.5	7	0.04	0
30BH0641-1	0.5	1	0	0	0
30BH0641-1.5	1	1.5	0	0	0
30BH0641-2	1.5	2	0	0	0
30BH0641-2.5	2	2.5	0	0	0
30BH0641-3	2.5	3	0	0	0
30BH0641-3.5	3	3.5	0	0	0
30BH0641-A-0.5	0	0.5	31	0	0
30BH0642-0.5	0	0.5	245	0.19	0
30BH0642-1	0.5	1	42	0	0
30BH0642-1.5	1	1.5	5	0	0
30BH0642-2	1.5	2	0	0	0
30BH0642-2.5	2	2.5	0	0	0
30BH0642-3	2.5	3	0	0	0
30BH0642-3.5	3	3.5	0	0	0
30BH0642-A-0.5	0	0.5	247	0.26	0
30BH0643-0.5	0	0.5	628	1.03	0
30BH0643-1	0.5	1	73	0	0
30BH0643-1.5	1	1.5	64	0.36	0
30BH0643-2	1.5	2	86	0	0
30BH0643-2.5	2	2.5	316	0.16	0
30BH0643-3	2.5	3	6	0	0
30BH0643-3.5	3	3.5	64	0	0
30BH0643-4	3.5	4	22	0	0
30BH0643-A-0.5	0	0.5	1056	1.96	0
30BH0644-0.5	0	0.5	434	0.08	0
30BH0644-1	0.5	1	133	0.24	0
30BH0644-1.5	1	1.5	102.67	0	0
30BH0644-2	1.5	2	97	0	0
30BH0644-2.5	2	2.5	18	0	0
30BH0644-3	2.5	3	14.33	0	0
30BH0644-A-0.5	0	0.5	337.67	0.1	0
30BH0645-0.5	0	0.5	314.67	0.16	0
30BH0645-1	0.5	1	121.67	0.16	0
30BH0645-1.5	1	1.5	17.33	0	0
30BH0645-2	1.5	2	24	0	0
30BH0645-2.5	2	2.5	24	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0645-3	2.5	3	0	0	0
30BH0645-3.5	3	3.5	10.33	0	0
30BH0645-A-0.5	0	0.5	232.67	0.35	0.21
30BH0646-0.5	0	0.5	85	0.17	0
30BH0646-1	0.5	1	27	0	0
30BH0646-1.5	1	1.5	35	0	0
30BH0646-2	1.5	2	6	0	0
30BH0646-2.5	2	2.5	0	0	0
30BH0646-3	2.5	3	0	0	0
30BH0646-3.5	3	3.5	0	0	0
30BH0646-4	3.5	4	0	0	0
30BH0646-A-0.5	0	0.5	156	0.1	0
30BH0647-0.5	0	0.5	46.33	0.2	0.13
30BH0647-1	0.5	1	23.67	0	0
30BH0647-1.5	1	1.5	8	0	0
30BH0647-2	1.5	2	7.33	0	0
30BH0647-2.5	2	2.5	0	0	0
30BH0647-3	2.5	3	0	0	0
30BH0647-3.5	3	3.5	0	0	0
30BH0647-A-0.5	0	0.5	283.33	0	0
30BH0648-0.5	0	0.5	259.67	0.39	1.01
30BH0648-1	0.5	1	93	0	0.98
30BH0648-1.5	1	1.5	430.33	0.39	0.48
30BH0648-2	1.5	2	820.33	0.33	0
30BH0648-2.5	2	2.5	217.33	0.14	0
30BH0648-3	2.5	3	225.67	0.05	0.06
30BH0648-3.5	3	3.5	415	0	0
30BH0648-4	3.5	4	270.33	0.01	0.02
30BH0648-4.5	4	4.5	57.33	0.01	0
30BH0648-A-0.5	0	0.5	225.33	0.33	1.55
30BH0649-0.5	0	0.5	604	0.35	1.55
30BH0649-1	0.5	1	289	0.17	0
30BH0649-1.5	1	1.5	148	0.16	0.68
30BH0649-2	1.5	2	26.33	0.06	1.55
30BH0649-2.5	2	2.5	203	0.1	0.71
30BH0649-3	2.5	3	111	0	0
30BH0649-3.5	3	3.5	41.33	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0649-4	3.5	4	73	0	0
30BH0649-4.5	4	4.5	31	0	0
30BH0649-A-0.5	0	0.5	268	0.35	0.98
30BH0650-0.5	0	0.5	550.33	0	0
30BH0650-1	0.5	1	35.67	0	0
30BH0650-1.5	1	1.5	78.33	0	0
30BH0650-2	1.5	2	102	0	0
30BH0650-2.5	2	2.5	0	0	0
30BH0650-3	2.5	3	0	0	0
30BH0650-3.5	3	3.5	0	0	0
30BH0650-4	3.5	4	0	0	0
30BH0650-4.5	4	4.5	0	0	0
30BH0650-A-0.5	0	0.5	207.33	0	0
30BH0651-0.5	0	0.5	58.33	0	0.34
30BH0651-1	0.5	1	115.83	0	0
30BH0651-1.5	1	1.5	35.67	0	0
30BH0651-2	1.5	2	31.33	0	0
30BH0651-2.5	2	2.5	0	0	0
30BH0651-3	2.5	3	0	0	0
30BH0651-3.5	3	3.5	0	0	0
30BH0651-A-0.5	0	0.5	193.33	0.1	0
30BH0652-0.5	0	0.5	712.67	0.05	0
30BH0652-1	0.5	1	689.67	0.29	0
30BH0652-1.5	1	1.5	85.33	0	0
30BH0652-2	1.5	2	127.67	0	0
30BH0652-2.5	2	2.5	37.33	0	0
30BH0652-3	2.5	3	41.33	0	0
30BH0652-3.5	3	3.5	8	0	0
30BH0652.4	3.5	4	52.33	0	0
30BH652-A-0.5	0	0.5	720	0	0
30BH0653-0.5	0	0.5	125	0.26	58.63
30BH0653-1	0.5	1	0	0.12	5.72
30BH0653-1.5	1	1.5	0	0	0
30BH0653-2	1.5	2	0	0	0
30BH0653-2.5	2	2.5	0	0	3.73
30BH0653-3	2.5	3	0	0	0
30BH0653-3.5	3	3.5	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0653-4	3.5	4	0	0	0
30BH0653-A-0.5	0	0.5	29	0	34.4
30BH0654-0.5	0	0.5	1274	1.59	1.16
30BH0654-1	0.5	1	232	0	0
30BH0654-1.5	1	1.5	243	0.56	0
30BH0654-2	1.5	2	473	0.15	0
30BH0654-2.5	2	2.5	32	0	0
30BH0654-3	2.5	3	153	0	0
30BH0654-3.5	3	3.5	0	0	0
30BH0654-4	3.5	4	0	0	0
30BH0654-A-0.5	0	0.5	1693	2.11	1.82
30BH0655-0.5	0	0.5	211.67	0	0.7
30BH0655-1	0.5	1	166.67	0	0.23
30BH0655-1.5	1	1.5	200	0	0
30BH0655-2	1.5	2	56	0	0
30BH0655-2.5	2	2.5	21	0	0
30BH0655-3	2.5	3	25.33	0	0
30BH0655-3.5	3	3.5	0	0	0
30BH0655-4	3.5	4	14	0	0
30BH0655-4.5	4	4.5	0	0	0
30BH0655-A-0.5	0	0.5	181	0.03	2.39
30BH0656-0.5	0	0.5	303.33	0.63	1.52
30BH0656-1	0.5	1	210.67	0.17	1.36
30BH0656-1.5	1	1.5	214	0.31	3.59
30BH0656-2	1.5	2	235.33	0.37	0.78
30BH0656-2.5	2	2.5	243	0.2	0.5
30BH0656-3	2.5	3	295	0	0
30BH0656-3.5	3	3.5	176.67	0	0
30BH0656-4	3.5	4	124	0	0
30BH0656-4.5	4	4.5	33	0	0
30BH0656-A-0.5	0	0.5	325.67	0.23	2.77
30BH0657-0.5	0	0.5	128	0.09	0
30BH0657-1	0.5	1	26.33	0	0
30BH0657-1.5	1	1.5	0	0	0
30BH0657-2	1.5	2	0	0	0
30BH0657-2.5	2	2.5	0	0	0
30BH0657-3	2.5	3	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0657-3.5	3	3.5	0	0	0
30BH0657-A-0.5	0	0.5	291.33	0.18	0
30BH0658-0.5	0	0.5	518	0	0
30BH0658-1	0.5	1	169.67	0	0
30BH0658-1.5	1	1.5	36	0	0
30BH0658-2	1.5	2	0	0	0
30BH0658-2.5	2	2.5	0	0	0
30BH0658-3	2.5	3	0	0	0
30BH0658-3.5	3	3.5	4.33	0	0
30BH0658-A-0.5	0	0.5	275.33	0.32	0
30BH0659-0.5	0	0.5	954	0.36	0
30BH0659-1	0.5	1	229	0.24	0
30BH0659-1.5	1	1.5	535.67	0.32	3.2
30BH0659-2	1.5	2	42.67	0	0
30BH0659-2.5	2	2.5	91.67	0	0
30BH0659-3	2.5	3	51.33	0	0
30BH0659-3.5	3	3.5	11	0	0
30BH0659-4	3.5	4	44.67	0	0
30BH0659-A-0.5	0	0.5	779.67	0.27	1.44
30BH0660-0.5	0	0.5	706	1.33	0
30BH0660-1	0.5	1	177	0.27	1.26
30BH0660-1.5	1	1.5	89	0.38	0
30BH0660-2	1.5	2	130	0	0
30BH0660-2.5	2	2.5	98	0	0
30BH0660-3	2.5	3	336	0	0
30BH0660-A-0.5	0	0.5	381	0.47	0
30BH0661-0.5	0	0.5	187.67	0.1	1.11
30BH0661-1	0.5	1	136	0.02	0.23
30BH0661-1.5	1	1.5	180	0.01	0.89
30BH0661-2	1.5	2	315.67	0	0.99
30BH0661-2.5	2	2.5	93.33	0.02	0.09
30BH0661-3	2.5	3	58	0	0
30BH0661-3.5	3	3.5	93	0	0
30BH0661-4	3.5	4	55.33	0.01	0.17
30BH0661-4.5	4	4.5	8	0	0.18
30BH0661-A-0.5	0	0.5	302.67	0.39	1.69
30BH0662-0.5	0	0.5	1139	0.37	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0662-1	0.5	1	524.67	0.21	0.44
30BH0662-1.5	1	1.5	343	0.25	1.76
30BH0662-2	1.5	2	865.33	0	1.48
30BH0662-2.5	2	2.5	228	0.17	1.21
30BH0662-3	2.5	3	1052	0.15	4.78
30BH0662-3.5	3	3.5	204.67	0	0
30BH0662-4	3.5	4	119	0	0
30BH0662-4.5	4	4.5	115.67	0	0
30BH0662-A-0.5	0	0.5	1135.67	0.48	0
30BH0663-0.5	0	0.5	295.33	0.1	0
30BH0663-1	0.5	1	75	0	0
30BH0663-1.5	1	1.5	62.33	0	0
30BH0663-2	1.5	2	27.67	0	0
30BH0663-2.5	2	2.5	30	0	0
30BH0663-3	2.5	3	0	0	0
30BH0663-A-0.5	0	0.5	378.33	0.08	0.59
30BH0664-0.5	0	0.5	223	0.05	0
30BH0664-1	0.5	1	89.67	0	0
30BH0664-1.5	1	1.5	44.67	0	0
30BH0664-2	1.5	2	39.67	0	0
30BH0664-2.5	2	2.5	41.67	0	0
30BH0664-3	2.5	3	0	0	0
30BH0664-3.5	3	3.5	0	0	0
30BH0664-4	3.5	4	0	0	0
30BH0664-4.5	4	4.5	20.67	0	0
30BH0664-A-0.5	0	0.5	399	0.1	0
30BH0665-0.5	0	0.5	308	0.43	0
30BH0665-1	0.5	1	802	0.82	1.42
30BH0665-1.5	1	1.5	362.33	0.43	0
30BH0665-2	1.5	2	27.67	0.17	0
30BH0665-2.5	2	2.5	26.67	0	0
30BH0665-3	2.5	3	4.33	0	0
30BH0665-3.5	3	3.5	86.33	0	0
30BH0665-4	3.5	4	299.33	0	0
30BH0665-A-0.5	0	0.5	345	0.11	0
30BH0666-0.5	0	0.5	510.33	0.15	1.45
30BH0666-1	0.5	1	121.33	0.12	2.48

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0666-1.5	1	1.5	310	0.39	1.62
30BH0666-2	1.5	2	214.33	0.08	1.74
30BH0666-2.5	2	2.5	165.33	0.18	0.31
30BH0666-3	2.5	3	33	0	0.18
30BH0666-3.5	3	3.5	39.33	0	0.28
30BH0666-4	3.5	4	36	0	1.78
30BH0666-4.5	4	4.5	61.67	0	0.12
30BH0666-A-0.5	0	0.5	546	0.33	1.99
30BH0667-0.5	0	0.5	302	0.16	0.51
30BH0667-1	0.5	1	61	0.26	0.54
30BH0667-1.5	1	1.5	172	0	0
30BH0667-2	1.5	2	1086	0.17	1.67
30BH0667-2.5	2	2.5	35	0	0
30BH0667-3	2.5	3	32	0	0
30BH0667-3.5	3	3.5	136	0	0
30BH0667-4	3.5	4	17	0	0
30BH0667-4.5	4	4.5	112	0	0
30BH0667-A-0.5	0	0.5	75	0.11	0
30BH0668-0.5	0	0.5	41.67	0.05	1.29
30BH0668-1	0.5	1	38.67	0	0
30BH0668-1.5	1	1.5	0	0	0
30BH0668-2	1.5	2	0	0	0
30BH0668-2.5	2	2.5	12.67	0	0
30BH0668-3	2.5	3	71.67	0	0
30BH0668-A-0.5	0	0.5	66.67	0	0
30BH0669-0.5	0	0.5	371	1.75	17.47
30BH0669-1	0.5	1	69.33	0.36	9.18
30BH0669-1.5	1	1.5	45.67	0.06	0.65
30BH0669-2	1.5	2	34	0.05	2.4
30BH0669-2.5	2	2.5	23.33	0	0.43
30BH0669-3	2.5	3	24	0.18	5.78
30BH0669-3.5	3	3.5	31	0	2.2
30BH0669-A-0.5	0	0.5	131.67	0.21	0.96
30BH0670-0.5	0	0.5	403.67	0.21	2.9
30BH0670-1	0.5	1	76.33	0	0
30BH0670-1.5	1	1.5	1845	2.98	0.25
30BH0670-2	1.5	2	223	0.08	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-1
XRF Screening and Debris Results: Area A
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0670-2.5	2	2.5	144.33	0.13	0
30BH0670-3	2.5	3	31	0	0
30BH0670-3.5	3	3.5	93	0	0
30BH0670-4	3.5	4	69.67	0	0
30BH0670-4.5	4	4.5	0	0	0
30BH0670-A-0.5	0	0.5	279.67	0.55	3.02
30BH0671-0.5	0	0.5	221	0.18	3.34
30BH0671-1	0.5	1	234	0.24	0.29
30BH0671-1.5	1	1.5	273	0.12	0
30BH0671-2	1.5	2	124	0	0
30BH0671-2.5	2	2.5	15	0	0
30BH0671-3	2.5	3	7	0	0
30BH0671-3.5	3	3.5	30	0	0
30BH0671-4	3.5	4	0	0	0
30BH0671-4.5	4	4.5	0	0	0
30BH0671-A-0.5	0	0.5	218	0	0
30BH0672-0.5	0	0.5	224	0.43	0.47
30BH0672-1	0.5	1	268	0.53	0
30BH0672-1.5	1	1.5	152	0	9.65
30BH0672-2	1.5	2	169	0	17.06
30BH0672-2.5	2	2.5	249	0	7.18
30BH0672-3	2.5	3	0	0	0
30BH0672-3.5	3	3.5	0	0	0
30BH0672-4	3.5	4	0	0	0
30BH0672-4.5	4	4.5	0	0	0.64
30BH0672-A-0.5	0	0.5	273	0.3	0.15
30BH0673-0.5	0	0.5	276.67	0.2	0
30BH0673-1	0.5	1	225.67	0.18	0
30BH0673-1.5	1	1.5	303.67	0.36	0
30BH0673-2	1.5	2	177	0.08	0.4
30BH0673-2.5	2	2.5	187.67	0.14	4.64
30BH0673-3	2.5	3	177.67	0.06	9.29
30BH0673-3.5	3	3.5	155	0	0
30BH0673-4	3.5	4	141	0.19	0
30BH0673-435	4	4.5	81.33	0	0
30BH0673-A-0.5	0	0.5	206	0.16	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-2
XRF Screening and Debris Results: Area B
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0677-0.5	0	0.5	32	0	0
30BH0677-1	0.5	1	6	0	0
30BH0677-1.5	1	1.5	0	0	0
30BH0677-2	1.5	2	0	0	0
30BH0677-2.5	2	2.5	0	0	0
30BH0677-3	2.5	3	0	0	0
30BH0677-3.5	3	3.5	0	0	0
30BH0677-A-0.5	0	0.5	27	0	0
30BH0678-0.5	0	0.5	41	0.17	0
30BH0678-1	0.5	1	75	0	0
30BH0678-1.5	1	1.5	11	0	0
30BH0678-2	1.5	2	9	0	0
30BH0678-2.5	2	2.5	7	0	0
30BH0678-3	2.5	3	2	0	0
30BH0678-3.5	3	3.5	7	0	0
30BH0678-4	3.5	4	0	0	0
30BH0678-A-0.5	0	0.5	10	0	0
30BH0679-0.5	0	0.5	150	0.1	0
30BH0679-1	0.5	1	4	0	0
30BH0679-1.5	1	1.5	0	0	0
30BH0679-2	1.5	2	11	0	0
30BH0679-2.5	2	2.5	2	0	0
30BH0679-3	2.5	3	0	0	0
30BH0679-3.5	3	3.5	0	0	0
30BH0679-4	3.5	4	0	0	0
30BH0679-A-0.5	0	0.5	107	0	0
30BH0680-0.5	0	0.5	10	0	0
30BH0680-1	0.5	1	0	0	0
30BH0680-1.5	1	1.5	0	0	0
30BH0680-2	1.5	2	0	0	0
30BH0680-2.5	2	2.5	0	0	0
30BH0680-3	2.5	3	0	0	0
30BH0680-3.5	3	3.5	0	0	0
30BH0680-4	3.5	4	0	0	0
30BH0680-A-0.5	0	0.5	14	0	0
30BH0681-0.5	0	0.5	21	0	0
30BH0681-1	0.5	1	2	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-2
XRF Screening and Debris Results: Area B
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0681-1.5	1	1.5	0	0	0
30BH0681-2	1.5	2	0	0	0
30BH0681-2.5	2	2.5	0	0	0
30BH0681-3	2.5	3	0	0	0
30BH0681-3.5	3	3.5	0	0	0
30BH0681-4	3.5	4	0	0	0
30BH0681-A-0.5	0	0.5	27	0	0
30BH0682-0.5	0	0.5	38	0	0.17
30BH0682-1	0.5	1	0	0	0
30BH0682-1.5	1	1.5	0	0	0
30BH0682-2	1.5	2	6	0	0
30BH0682-2.5	2	2.5	0	0	0
30BH0682-A-0.5	0	0.5	32	0	0.04
30BH0683-0.5	0	0.5	86	0.12	0
30BH0683-1	0.5	1	101	0	0
30BH0683-1.5	1	1.5	0	0	0
30BH0683-2	1.5	2	0	0	0
30BH0683-2.5	2	2.5	0	0	0
30BH0683-3	2.5	3	0	0	0
30BH0683-A-0.5	0	0.5	70	0.25	0
30BH0684-0.5	0	0.5	78	0	0
30BH0684-1	0.5	1	0	0	0
30BH0684-1.5	1	1.5	3	0	0
30BH0684-2	1.5	2	6	0	0
30BH0684-2.5	2	2.5	0	0	0
30BH0684-3	2.5	3	0	0	0
30BH0684-3.5	3	3.5	0	0	0
30BH0684-4	3.5	4	0	0	0
30BH0684-A-0.5	0	0.5	58	0	0
30BH0685-0.5	0	0.5	36	0	0
30BH0685-1	0.5	1	25	0	0
30BH0685-1.5	1	1.5	0	0	0
30BH0685-2	1.5	2	0	0	0
30BH0685-2.5	2	2.5	0	0	0
30BH0685-3	2.5	3	0	0	0
30BH0685-3.5	3	3.5	0	0	0
30BH0685-4	3.5	4	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-2
XRF Screening and Debris Results: Area B
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0685-A-0.5	0	0.5	9	0	0
30BH0686-0.5	0	0.5	38	0.15	0
30BH0686-1	0.5	1	6	0	0
30BH0686-1.5	1	1.5	8	0	0
30BH0686-2	1.5	2	0	0	0
30BH0686-2.5	2	2.5	0	0	0
30BH0686-3	2.5	3	0	0	0
30BH0686-3.5	3	3.5	0	0	0
30BH0686-4	3.5	4	0	0	0
30BH0686-A-0.5	0	0.5	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-3
XRF Screening and Debris Results: Area C
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Beginning Depth (ft)	Ending Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0674-0.5	0	0.5	52	0	0
30BH0674-1	0.5	1	5	0	0
30BH0674-1.5	1	1.5	36	0	0
30BH0674-2	1.5	2	0	0	0
30BH0674-2.5	2	2.5	0	0	0
30BH0674-3	2.5	3	0	0	0
30BH0674-3.5	3	3.5	11	0	0
30BH0674-A-0.5	0	0.5	28	0	0
30BH0675-0.5	0	0.5	91	0.06	0
30BH0675-1	0.5	1	23	0	0
30BH0675-1.5	1	1.5	0	0	0
30BH0675-2	1.5	2	0	0	0
30BH0675-A-0.5	0	0.5	72	0.05	0
30BH0676-0.5	0	0.5	111	0.09	0
30BH0676-1	0.5	1	6	0	0
30BH0676-1.5	1	1.5	5	0	0
30BH0676-2	1.5	2	71	0	0
30BH0676-2.5	2	2.5	51	0	0
30BH0676-3	2.5	3	6	0	0
30BH0676-3.5	3	3.5	0	0	0
30BH0676-4	3.5	4	0	0	0
30BH0676-A-0.5	0	0.5	227	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

**Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0551-0.5	0	0.5	153	0.24	2.79
30BH0551-1.0	0.5	1	243	0.45	0
30BH0551-1.5	1	1.5	57	0.12	0.86
30BH0551-2.0	1.5	2	0	0	0
30BH0551-2.5	2	2.5	4	0	0
30BH0551-3.0	2.5	3	0	0	0
30BH0551-3.5	3	3.5	9	0	0
30BH0551-4.0	3.5	4	16	0	0
30BH0551-A-0.5	0	0.5	50	0	1.85
30BH0552-0.5	0	0.5	150	0.08	2.49
30BH0552-1	0.5	1	37	0	0
30BH0552-1.5	1	1.5	0	0	0
30BH0552-2	1.5	2	0	0	0
30BH0552-2.5	2	2.5	5	0	0
30BH0552-3	2.5	3	0	0	0
30BH0552-A-0.5	0	0.5	111	0	5.69
30BH0553-0.5	0	0.5	101	0.42	0.85
30BH0553-1	0.5	1	335	0.7	0
30BH0553-1.5	1	1.5	214	0.17	7.32
30BH0553-2	1.5	2	69	0	0
30BH0553-2.5	2	2.5	57	0	0
30BH0553-3	2.2	3	8	0	0
30BH0553-A-0.5	0	0.5	147	0.15	0
30BH0554-0.5	0	0.5	47	0	1.97
30BH0554-1	0.5	1	17	0	0
30BH0554-1.5	1	1.5	0	0	0
30BH0554-2	1.5	2	0	0	0
30BH0554-2.5	2	2.5	0	0	0
30BH0554-A-0.5	0	0.5	31	0	0
30BH0555-0.5	0	0.5	125	0.1	1.67
30BH0555-1	0.5	1	120	0.07	3.3
30BH0555-1.5	1	1.5	30	0	0
30BH0555-2	1.5	2	0	0	0
30BH0555-2.5	2	2.5	0	0	0
30BH0555-3	2.5	3	0	0	0
30BH0555-A-0.5	0	0.5	135	0.07	0.91
30BH0556-0.5	0	0.5	126	0.27	2.62

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0556-1	0.5	1	145	0.16	2.28
30BH0556-1.5	1	1.5	61	0	0
30BH0556-2	1.5	2	48	0	0
30BH0556-2.5	2	2.5	5	0.05	0.11
30BH0556-3	2.5	3	5	0	0.21
30BH0556-A-0.5	0	0.5	134	0.05	0.68
30BH0557-0.5	0	0.5	175	0.19	8.32
30BH0557-1	0.5	1	169	0.25	9.51
30BH0557-1.5	1	1.5	69	0.07	11.13
30BH0557-2	1.5	2	12	0	2.78
30BH0557-2.5	2	2.5	165	0	10.06
30BH0557-3	2.5	3	0	0	0.22
30BH0557-3.5	3	3.5	0	0	1.76
30BH0557-4	3.5	4	18	0	0
30BH0557-A-0.5	0	0.5	142	0.12	1.14
30BH0558-0.5	0	0.5	115	0.09	5.22
30BH0558-1	0.5	1	76	0	2.64
30BH0558-1.5	1	1.5	44	0	0
30BH0558-2	1.5	2	7	0	0
30BH0558-2.5	2	2.5	0	0	0
30BH0558-3	2.5	3	0	0	0
30BH0558-A-0.5	0	0.5	167	0.05	3.77
30BH0559-0.5	0	0.5	114	0.25	3.33
30BH0559-1	0.5	1	211	0.2	0.81
30BH0559-1.5	1	1.5	180	0.13	0
30BH0559-2	1.5	2	127	0	2.14
30BH0559-2.5	2	2.5	18	0	0
30BH0559-3	2.5	3	4	0	0
30BH0559-3.5	3	3.5	0	0	0
30BH0559-4	3.5	4	0	0	0
30BH0559-A-0.5	0	0.5	107	0	4.16
30BH0560-0.5	0	0.5	79	0	2.57
30BH0560-1	0.5	1	176	0	0
30BH0560-1.5	1	1.5	176	0.43	0.89
30BH0560-2	1.5	2	148	0.09	0
30BH0560-2.5	2	2.5	37	0	0
30BH0560-3	2.5	3	83	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0560-A-0.5	0	0.5	84	0.04	2.2
30BH0561-0.5	0	0.5	220	0.2	0
30BH0561-1	0.5	1	468	0.59	0
30BH0561-1.5	1	1.5	117	0	0
30BH0561-2	1.5	2	216	0	0
30BH0561-2.5	2	2.5	38	0.06	0
30BH0561-3	2.5	3	30	0	0
30BH0561-3.5	3	3.5	0	0	0
30BH0561-A-0.5	0	0.5	121	0.09	0
30BH0562-0.5	0	0.5	4	0.19	0
30BH0562-1	0.5	1	190	0.25	0
30BH0562-1.5	1	1.5	167	0.09	4.42
30BH0562-2	1.5	2	107	0	0
30BH0562-2.5	2	2.5	47	0	0
30BH0562-3	2.5	3	14	0	0
30BH0562-3.5	3	3.5	4	0	0
30BH0562-4	3.5	4	4	0	0
30BH0562-A-0.5	0	0.5	176	0.4	0
30BH0563-0.5	0	0.5	198	0.16	1.47
30BH0563-1	0.5	1	210	0.16	6.14
30BH0563-1.5	1	1.5	141	0	20.19
30BH0563-2	1.5	2	541	0	13.34
30BH0563-2.5	2	2.5	819	0.08	20.24
30BH0563-3	2.5	3	530	0	13.83
30BH0563-3.5	3	3.5	452	0	12.01
30BH0563-4	3.5	4	340	0	19.45
30BH0563-A-0.5	0	0.5	180	0.16	0.27
30BH0564-0.5	0	0.5	264	0.13	2.22
30BH0564-1	0.5	1	64	0	0
30BH0564-1.5	1	1.5	361	0.15	3.79
30BH0564-2	1.5	2	133	0	3.09
30BH0564-2.5	2	2.5	61	0	0
30BH0564-3	2.5	3	54	0	0
30BH0564-3.5	3	3.5	16	0	0
30BH0564-4	3.5	4	6	0	0
30BH0564-A-0.5	0	0.5	260	0.35	7.91
30BH0565-0.5	0	0.5	410	0.21	1.69

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0565-1	0.5	1	209	0.22	0
30BH0565-1.5	1	1.5	624	0.65	2.62
30BH0565-2	1.5	2	100	0	0
30BH0565-2.5	2	2.5	73	0	0
30BH0565-3	2.5	3	23	0	0
30BH0565-3.5	3	3.5	22	0	0
30BH0565-4	3.5	4	40	0	0
30BH0565-A-0.5	0	0.5	151	0.12	2.82
30BH0566-0.5	0	0.5	219	0.18	1.02
30BH0566-1	0.5	1	255	0.45	0
30BH0566-1.5	1	1.5	250	0.5	0
30BH0566-2	1.5	2	359	1.12	0.64
30BH0566-2.5	2	2.5	254	0.23	0
30BH0566-3	2.5	3	72	0	0
30BH0566-3.5	3	3.5	30	0	0
30BH0566-A-0.5	0	0.5	195	0.42	0
30BH0567-0.5	0	0.5	310	0	0
30BH0567-1	0.5	1	325	0.05	10.62
30BH0567-1.5	1	1.5	298	0.12	12.83
30BH0567-2	1.5	2	65	0	0
30BH0567-2.5	2	2.5	59	0	0
30BH0567-3	2.5	3	85	0	0
30BH0567-3.5	3	3.5	310	0	0
30BH0567-4	3.5	4	0	0	0
30BH0567-A-0.5	0	0.5	228	0.21	3.69
30BH0568-0.5	0	0.5	213	0.34	0.57
30BH0568-1	0.5	1	289	0	6.95
30BH0568-1.5	1	1.5	200	0.09	1.25
30BH0568-2	1.5	2	255	0	0
30BH0568-2.5	2	2.5	200	0	0
30BH0568-3	2.5	3	18	0	0
30BH0568-3.5	3	3.5	35	0	0
30BH0568-4	3.5	4	23	0	0
30BH0568-A-0.5	0	0.5	282	0.4	1.25
30BH0569-0.5	0	0.5	402	0.24	4.16
30BH0569-1	0.5	1	307	0	5.44
30BH0569-1.5	1	1.5	143	0.24	0.47

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

**Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0569-2	1.5	2	52	0.07	0.77
30BH0569-2.5	2	2.5	81	0	0
30BH0569-3	2.5	3	89	0	0
30BH0569-3.5	3	3.5	15	0	0
30BH0569-4	3.5	4	15	0	0
30BH0569-A-0.5	0	0.5	398	0.18	5.49
30BH0570-0.5	0	0.5	136	0.08	0.49
30BH0570-1	0.5	1	14	0	0
30BH0570-1.5	1	1.5	24	0	0
30BH0570-2	1.5	2	7	0	0
30BH0570-2.5	2	2.5	67	0	0
30BH0570-3	2.5	3	16	0	0
30BH0570-A-0.5	0	0.5	165	0	0
30BH0571-0.5	0	0.5	94	0.14	0
30BH0571-1	0.5	1	100	0	0
30BH0571-1.5	1	1.5	175	0.31	0
30BH0571-2	1.5	2	122	0.15	0.98
30BH0571-2.5	2	2.5	396	0	0
30BH0571-3	2.5	3	54	0	0
30BH0571-3.5	3	3.5	47	0	0
30BH0371-4	3.5	4	22	0	0
30BH0571-A-0.5	0	0.5	90	0.17	0
30BH0572-0.5	0	0.5	170	0.37	0
30BH0572-1	0.5	1	183	0.34	0
30BH0572-1.5	1	1.5	141	0.11	0
30BH0572-2	1.5	2	93	0	0
30BH0572-2.5	2	2.5	185	0	0
30BH0572-3	2.5	3	100	0	0
30BH0572-3.5	3	3.5	37	0	0
30BH0572-A-0.5	0	0.5	263	0.82	0
30BH0573-0.5	0	0.5	205	0.26	0
30BH0573-1	0.5	1	120	0	0
30BH0573-1.5	1	1.5	72	0	0
30BH0573-2	1.5	2	22	0	0
30BH0573-2.5	2	2.5	26	0	0
30BH0573-3	2.5	3	28	0	0
30BH0573-3.5	3	3.5	18	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0573-A-0.5	0	0.5	345	0.3	0
30BH0574-0.5	0	0.5	286	0.97	2.83
30BH0574-1	0.5	1	198	0.19	0
30BH0574-1.5	1	1.5	298	0.05	1.2
30BH0574-2	1.5	2	189	0	0
30BH0574-2.5	2	2.5	68	0	0
30BH0574-3	2.5	3	47	0	0
30BH0574-3.5	3	3.5	13	0	0
30BH0574-4	3.5	4	0	0	0
30BH0574-A-0.5	0	0.5	272	0.25	0
30BH0575-0.5	0	0.5	195	0.24	0
30BH0575-1	0.5	1	293	0.25	0
30BH0575-1.5	1	1.5	117	0	0
30BH0575-2	1.5	2	375	0.1	2.45
30BH0575-2.5	2	2.5	203	0.04	1.6
30BH0575-3	2.5	3	61	0	0
30BH0575-3.5	3	3.5	13	0	0
30BH0575-4	3.5	4	0	0	0
30BH0575-A-0.5	0	0.5	194	0.05	0
30BH0576-0.5	0	0.5	560	0.53	7.91
30BH0576-1	0.5	1	432	0.12	11.48
30BH0576-1.5	1	1.5	207	0.06	3.89
30BH0576-2	1.5	2	611	0.16	2.42
30BH0576-2.5	2	2.5	278	0	0
30BH0576-3	2.5	3	58	0	0
30BH0576-3.5	3	3.5	24	0	0
30BH0576-4	3.5	4	17	0	0
30BH0576-A-0.5	0	0.5	260	0.19	10.81
30BH0577-0.5	0	0.5	311	0	0
30BH0577-1	0.5	1	80	0.22	1.46
30BH0577-1.5	1	1.5	26	0	0
30BH0577-2	1.5	2	0	0	0
30BH0577-2.5	2	2.5	0	0	0
30BH0577-3	2.5	3	48	0	0
30BH0577-3.5	3	3.5	56	0	0
30BH0577-4	3.5	4	4	0	0
30BH0577-A-0.5	0	0.5	284	0.43	2.2

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0578-0.5	0	0.5	188	0.32	0
30BH0578-1	0.5	1	135	0	0
30BH0578-1.5	1	1.5	35	0	0
30BH0578-2	1.5	2	16	0	0
30BH0578-2.5	2	2.5	5	0	0
30BH0578-3	2.5	3	0	0	0
30BH0578-A-0.5	0	0.5	215	0.15	0
30BH0579-0.5	0	0.5	152	0.15	0
30BH0579-1	0.5	1	156	0.13	0
30BH0579-1.5	1	1.5	85	0.42	0
30BH0579-2	1.5	2	48	0	0
30BH0579-2.5	2	2.5	6	0	0
30BH0579-3	2.5	3	0	0	0
30BH0579-3.5	3	3.5	9	0	0
30BH0579-4	3.5	4	4	0	0
30BH0579-A-0.5	0	0.5	112	0.22	0
30BH0580-0.5	0	0.5	97	0	0
30BH0580-1	0.5	1	301	0	0
30BH0580-1.5	1	1.5	64	0	0
30BH0580-2	1.5	2	45	0	0
30BH0580-2.5	2	2.5	15	0	0
30BH0580-3	2.5	3	14	3.63	0.17
30BH0580-3.5	3	3.5	6	0	0
30BH0580-4	3.5	4	0	0	0
30BH0580-A-0.5	0	0.5	120	0	0
30BH0581-0.5	0	0.5	214	0.42	0
30BH0581-1	0.5	1	177	0	0
30BH0581-1.5	1	1.5	481	0.13	0
30BH0581-2	1.5	2	136	0.25	0
30BH0581-2.5	2	2.5	124	0	0
30BH0581-3	2.5	3	31	0	0
30BH0581-3.5	3	3.5	5	0	0
30BH0581-4	3.5	4	8	0	0
30BH0581-A-0.5	0	0.5	270	0.01	0
30BH0582-0.5	0	0.5	186	0	0
30BH0582-1	0.5	1	339	0.19	1.99
30BH0582-1.5	1	1.5	208	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0582-2	1.5	2	216	0	0
30BH0582-2.5	2	2.5	118	0	0
30BH0582-3	2.5	3	70	0	0
30BH0582-3.5	3	3.5	19	0	0
30BH0582-4	3.5	4	21	0	0
30BH0582-A-0.5	0	0.5	197	0.22	0
30BH0583-0.5	0	0.5	102	0.1	0
30BH0583-1	0.5	1	41	0	0
30BH0583-1.5	1	1.5	87	0.15	0
30BH0583-2	1.5	2	182	0	0
30BH0583-2.5	2	2.5	240	0	0
30BH0583-3	2.5	3	48	0	0
30BH0583-A-0.5	0	0.5	118	0.1	0
30BH0584-0.5	0	0.5	284	0.26	2.18
30BH0584-1	0.5	1	261	0.27	0
30BH0584-1.5	1	1.5	161	0	0
30BH0584-2	1.5	2	91	0.55	0
30BH0584-A-0.5	0	0.5	284	0.48	0
30BH0585-0.5	0	0.5	117	0.17	0.32
30BH0585-1	0.5	1	99	0.1	0
30BH0585-1.5	1	1.5	174	0.59	0
30BH0585-2	1.5	2	174	0.25	0
30BH0585-2.5	2	2.5	400	0.12	0
30BH0585-3	2.5	3	18	0	0
30BH0585-A-0.5	0	0.5	136	0.27	0
30BH0586-0.5	0	0.5	236	0.29	0
30BH0586-1	0.5	1	64	0	0
30BH0586-1.5	1	1.5	54	0	0
30BH0586-2	1.5	2	151	0.24	0
30BH0586-2.5	2	2.5	98	0.34	0
30BH0586-A-0.5	0	0.5	221	0.58	0
30BH0587-0.5	0	0.5	57	0	0
30BH0587-1	0.5	1	36	0	0
30BH0587-1.5	1	1.5	11	0	0
30BH0587-2	1.5	2	0	0	0
30BH0587-2.5	2	2.5	0	0	0
30BH0587-3	2.5	3	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0587-A-0.5	0	0.5	46	0	0
30BH0588-0.5	0	0.5	82	0	0
30BH0588-1	0.5	1	46	0	0
30BH0588-1.5	1	1.5	36	0	0
30BH0588-2	1.5	2	67	0	0
30BH0588-2.5	2	2.5	119	0	0
30BH0588-3	2.5	3	13	0	0
30BH0588-3.5	3	3.5	14	0	0
30BH0588-4	3.5	4	0	0	0
30BH0588-A-0.5	0	0.5	85	0	0
30BH0589-0.5	0	0.5	76	0.13	0
30BH0589-1	0.5	1	7	0	0
30BH0589-1.5	1	1.5	54	0	0
30BH0589-2	1.5	2	69	0	0
30BH0589-2.5	2	2.5	21	0	0
30BH0589-3	2.5	3	0	0	0
30BH0589-3.5	3	3.5	0	0	0
30BH0589-4	3.5	4	0	0	0
30BH0589-A-0.5	0	0.5	147	0.19	0
30BH0590-0.5	0	0.5	0	0	0
30BH0590-1	0.5	1	29	0.05	0
30BH0590-1.5	1	1.5	188	0.28	0
30BH0590-2	1.5	2	297	0.34	0
30BH0590-2.5	2	2.5	640	0.31	0
30BH0590-3	2.5	3	62	0	0
30BH0590-3.5	3	3.5	51	0	0
30BH0590-A-0.5	0	0.5	0	0	0
30BH0591-0.5	0	0.5	0	0.05	0
30BH0591-1	0.5	1	52	0	0
30BH0591-1.5	1	1.5	80	0	0
30BH0591-2	1.5	2	98	0.31	4.74
30BH0591-2.5	2	2.5	271	0.04	0.86
30BH0591-3	2.5	3	165	0.1	0.45
30BH0591-3.5	3	3.5	45	0	0
30BH0591-A-0.5	0	0.5	7	0	0
30BH0592-0.5	0	0.5	94	0.05	0
30BH0592-1	0.5	1	82	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0592-1.5	1	1.5	312	0.63	0
30BH0592-2	1.5	2	891	0.51	0
30BH0592-2.5	2	2.5	683	0.53	0
30BH0592-3	2.5	3	18	0	0
30BH0592-3.5	3	3.5	12	0	0
30BH0592-A-0.5	0	0.5	106	0.17	0
30BH0593-0.5	0	0.5	72	0	0
30BH0593-1	0.5	1	89	0.12	0
30BH0593-1.5	1	1.5	63	0	0
30BH0593-2	1.5	2	132	0.18	0
30BH0593-2.5	2	2.5	92	0	0
30BH0593-3	2.5	3	128	0.1	0
30BH0593-3.5	3	3.5	127	0	0
30BH0593-A-0.5	0	0.5	78	0.4	0
30BH0594-0.5	0	0.5	83	0.23	0
30BH0594-1	0.5	1	79	0	0
30BH0594-1.5	1	1.5	103	0	0
30BH0594-2	1.5	2	560	0.9	0
30BH0594-2.5	2	2.5	98	0	0
30BH0594-3	2.5	3	14	0	0
30BH0594-3.5	3	3.5	16	0	0
30BH0594-A-0.5	0	0.5	71	0.07	0
30BH0595-0.5	0	0.5	43	0	0
30BH0595-1	0.5	1	308	0	0
30BH0595-1.5	1	1.5	69	0	0
30BH0595-2	1.5	2	22	0	0
30BH0595-2.5	2	2.5	15	0	0
30BH0595-3	2.5	3	6	0	0
30BH0595-3.5	3	3.5	0	0	0
30BH0595-A-0.5	0	0.5	43	0	0
30BH0596-0.5	0	0.5	30	0	0
30BH0596-1	0.5	1	14	0	0
30BH0596-1.5	1	1.5	0	0	0
30BH0596-2	1.5	2	2	0	0
30BH0596-2.5	2	2.5	0	0	0
30BH0596-3	2.5	3	0	0	0
30BH0596-A-0.5	0	0.5	86	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0597-0.5	0	0.5	62	0.11	0
30BH0597-1	0.5	1	35	0	0
30BH0597-1.5	1	1.5	72	0	0
30BH0597-2	1.5	2	28	0	0
30BH0597-2.5	2	2.5	0	0	0
30BH0597-A-0.5	0	0.5	139	0	0
30BH0598-0.5	0	0.5	117	0.17	0
30BH0598-1	0.5	1	14	0	0
30BH0598-1.5	1	1.5	9	0	0
30BH0598-2	1.5	2	290	0	0
30BH0598-2.5	2	2.5	195	0.13	0
30BH0598-3	2.5	3	5	0	0
30BH0598-3.5	3	3.5	20	0	0
30BH0598-4	3.5	4	17	0	0
30BH0598-A-0.5	0	0.5	92	0.16	0
30BH0599-0.5	0	0.5	0	0	0
30BH0599-1	0.5	1	0	0	0
30BH0599-1.5	1	1.5	16	0	0
30BH0599-2	1.5	2	27	0	0
30BH0599-2.5	2	2.5	144	0.09	0
30BH0599-A-0.5	0	0.5	6	0	0
30BH0600-0.5	0	0.5	12	0	0
30BH0600-1	0.5	1	20	0.1	0
30BH0600-1.5	1	1.5	90	0.05	0
30BH0600-2	1.5	2	49	0.09	0
30BH0600-2.5	2	2.5	59	0	0
30BH0600-3	2.5	3	26	0	0
30BH0600-3.5	3	3.5	32	0	0
30BH0600-4	3.5	4	0	0	0
30BH0600-A-0.5	0	0.5	6	0	0
30BH0601-0.5	0	0.5	176	0.23	0
30BH0601-1	0.5	1	89	0	0
30BH0601-1.5	1	1.5	160	0.11	0
30BH0601-2	1.5	2	516	0.45	0
30BH0601-2.5	2	2.5	62	0	0
30BH0601-3	2.5	3	13	0	0
30BH0601-3.5	3	3.5	22	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0601-A-0.5	0	0.5	185	0	0
30BH0602-0.5	0	0.5	197	0.22	0
30BH0602-1	0.5	1	152	0.22	0
30BH0602-1.5	1	1.5	157	0.16	0
30BH0602-2	1.5	2	217	0.46	0
30BH0602-2.5	2	2.5	281	0.42	0
30BH0602-3	2.5	3	253	0	0
30BH0602-A-0.5	0	0.5	135	0.09	0
30BH0603-0.5	0	0.5	201	0.56	0
30BH0603-1	0.5	1	166	0	0
30BH0603-1.5	1	1.5	50	0	0
30BH0603-2	1.5	2	67	0	0
30BH0603-2.5	2	2.5	8	0	0
30BH0603-3	2.5	3	0	0	0
30BH0603-3.5	3	3.5	4	0	0
30BH0603-A-0.5	0	0.5	168	0.17	0
30BH0604-0.5	0	0.5	15	0	0
30BH0604-1	0.5	1	0	0	0
30BH0604-1.5	1	1.5	0	0	0
30BH0604-2	1.5	2	0	0	0
30BH0604-2.5	2	2.5	0	0	0
30BH0604-A-0.5	0	0.5	6	0	0
30BH0605-0.5	0	0.5	218	0.45	0
30BH0605-1	0.5	1	171	0	0
30BH0605-1.5	1	1.5	65	0	0
30BH0605-2	1.5	2	0	0	0
30BH0605-A-0.5	0	0.5	203	0.29	0
30BH0606-0.5	0	0.5	176	0.36	0
30BH0606-1	0.5	1	194	0.13	0
30BH0606-1.5	1	1.5	289	0.46	1.07
30BH0606-2	1.5	2	246	0	3.16
30BH0606-2.5	2	2.5	490	0.76	0.28
30BH0606-3	2.5	3	357	0	0
30BH0606-3.5	3	3.5	47	0	0
30BH0606-A-0.5	0	0.5	187	0.39	0
30BH0607-0.5	0	0.5	173	0.22	0
30BH0607-1	0.5	1	188	0.18	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

**Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0607-1.5	1	1.5	148	0.25	0.45
30BH0607-2	1.5	2	165	0.23	0
30BH0607-2.5	2	2.5	174	0	0
30BH0607-3	2.5	3	65	0	0
30BH0607-A-0.5	0	0.5	176	0.21	0
30BH0608-0.5	0	0.5	386	0.57	0
30BH0608-1	0.5	1	288	0.27	0
30BH0608-1.5	1	1.5	90	0	0
30BH0608-2	1.5	2	7	0	0
30BH0608-2.5	2	2.5	0	0	0
30BH0608-3	2.5	3	0	0	0
30BH0608-3.5	3	3.5	2	0	0
30BH0608-A-0.5	0	0.5	297	0.34	0
30BH0609-0.5	0	0.5	120	0.02	0
30BH0609-1	0.5	1	284	0.05	0
30BH0609-1.5	1	1.5	51	0	0
30BH0609-2	1.5	2	77	0	0
30BH0609-2.5	2	2.5	20	0	0
30BH0609-3	2.5	3	0	0	0
30BH0609-3.5	3	3.5	0	0	0
30BH0609-4	3.5	4	0	0	0
30BH0609-A-0.5	0	0.5	166	0.05	0
30BH0610-0.5	0	0.5	32	0	0
30BH0610-1	0.5	1	64	0	0
30BH0610-1	0.5	1	64	0	0
30BH0610-1.5	1	1.5	35	0	0
30BH0610-1.5	1	1.5	35	0	0
30BH0610-2	1.5	2	5	0	0
30BH0610-2	1.5	2	5	0	0
30BH0610-2.5	2	2.5	0	0	0
30BH0610-2.5	2	2.5	0	0	0
30BH0610-A-0.5	0	0.5	38	0	0
30BH0611-0.5	0	0.5	245	0.3	0
30BH0611-1	0.5	1	157	0.53	0
30BH0611-1.5	1	1.5	197	0.3	0
30BH0611-2	1.5	2	364	0.37	0
30BH0611-2.5	2	2.5	79	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0611-3	2.5	3	6	0	0
30BH0611-3.5	3	3.5	0	0	0
30BH0611-4	3.5	4	19	0	0
30BH0611-A-0.5	0	0.5	292	0.39	0
30BH0612-0.5	0	0.5	161	0.15	0
30BH0612-1	0.5	1	221	0.37	0
30BH0612-1.5	1	1.5	352	0.27	0
30BH0612-2	1.5	2	142	0.22	0
30BH0612-2.5	2	2.5	80	0	0
30BH0612-3	2.5	3	99	0	0
30BH0612-3.5	3	3.5	19	0	0
30BH0612-A-0.5	0	0.5	173	0.17	0
30BH0613-0.5	0	0.5	187	0.54	0
30BH0613-1	0.5	1	184	0	0
30BH0613-1.5	1	1.5	133	0.32	2.01
30BH0613-2	1.5	2	136	0.21	0
30BH0613-2.5	2	2.5	372	0	0
30BH0613-3	2.5	3	66	0	0
30BH0613-3.5	3	3.5	13	0	0
30BH0613-A-0.5	0	0.5	153	0.32	0
30BH0614-0.5	0	0.5	210	0.1	0
30BH0614-1	0.5	1	171	0	0
30BH0614-1.5	1	1.5	234	0.31	0
30BH0614-2	1.5	2	53	0	0
30BH0614-2.5	2	2.5	37	0	0
30BH0614-3	2.5	3	20	0	0
30BH0614-3.5	3	3.5	15	0	0
30BH0614-A-0.5	0	0.5	210	0.69	0
30BH0615-0.5	0	0.5	233	0.41	0
30BH0615-1	0.5	1	243	0.57	0
30BH0615-1.5	1	1.5	110	0	0
30BH0615-2	1.5	2	138	0	0
30BH0615-2.5	2	2.5	68	0	0
30BH0615-3	2.5	3	41	0	0
30BH0615-3.5	3	3.5	4	0	0
30BH0615-A-0.5	0	0.5	255	0.28	0
30BH0616-0.5	0	0.5	68	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0616-1	0.5	1	101	0	0
30BH0616-1.5	1	1.5	59	0	0
30BH0616-2	1.5	2	28	0	0
30BH0616-2.5	2	2.5	34	0	0
30BH0616-3	2.5	3	0	0	0
30BH0616-3.5	3	3.5	0	0	0
30BH0616-4	3.5	4	0	0	0
30BH0616-A-0.5	0	0.5	56	0	0
30BH0617-0.5	0	0.5	37	0.12	0
30BH0617-1	0.5	1	145	0.11	0
30BH0617-1.5	1	1.5	0	0	0
30BH0617-2	1.5	2	0	0	0
30BH0617-2.5	2	2.5	0	0	0
30BH0617-A-0.5	0	0.5	54	0.06	0
30BH0618-0.5	0	0.5	232	0.34	0
30BH0618-1	0.5	1	153	0.35	0
30BH0618-1.5	1	1.5	296	0.28	0
30BH0618-2	1.5	2	347	0.43	0
30BH0618-2.5	2	2.5	122	0	0
30BH0618-3	2.5	3	340	0	0
30BH0618-3.5	3	3.5	97	0	0
30BH0618-A-0.5	0	0.5	271	0.1	0
30BH0619-0.5	0	0.5	229	0.57	0
30BH0619-1	0.5	1	187	0.43	0
30BH0619-1.5	1	1.5	250	0.43	0
30BH0619-2	1.5	2	209	0.57	0
30BH0619-2.5	2	2.5	196	0.32	0
30BH0619-3	2.5	3	235	0.25	0
30BH0619-3.5	3	3.5	206	0.44	0
30BH0619-A-0.5	0	0.5	266	0.39	0
30BH0620-0.5	0	0.5	237	0.52	0
30BH0620-1	0.5	1	297	0.36	0
30BH0620-1.5	1	1.5	522	0.14	0
30BH0620-2	1.5	2	128	0.32	0
30BH0620-2.5	2	2.5	55	0	0
30BH0620-3	2.5	3	42	0	0
30BH0620-3.5	3	3.5	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0620-4	3.5	4	91	0	0
30BH0620-A-0.5	0	0.5	200	0.42	0
30BH0621-0.5	0	0.5	196	0	1.18
30BH0621-1	0.5	1	274	0.35	1.26
30BH0621-1.5	1	1.5	184	0	14.09
30BH0621-2	1.5	2	64	0.11	0
30BH0621-2.5	2	2.5	22	0	0
30BH0621-3	2.5	3	0	0	0
30BH0621-3.5	3	3.5	0	0	0
30BH0621-A-0.5	0	0.5	196	0.23	0
30BH0622-0.5	0	0.5	265	0.26	0
30BH0622-1	0.5	1	312	0.57	0
30BH0622-1.5	1	1.5	368	0.46	0
30BH0622-2	1.5	2	59	0	0
30BH0622-2.5	2	2.5	53	0	0
30BH0622-3	2.5	3	19	0	0
30BH0622-3.5	3	3.5	0	0	0
30BH0622-A-0.5	0	0.5	224	0.33	0
30BH0623-0.5	0	0.5	249	0.18	0
30BH0623-1	0.5	1	160	0	0
30BH0623-1.5	1	1.5	23	0.04	0
30BH0623-2	1.5	2	16	0.04	0
30BH0623-2.5	2	2.5	13	0	0
30BH0623-3	2.5	3	6	0	0
30BH0623-3.5	3	3.5	0	0	0
30BH0623-4	3.5	4	0	0	0
30BH0623-A-0.5	0	0.5	291	0.3	0
30BH0624-0.5	0	0.5	136	0.23	0
30BH0624-1	0.5	1	47	0.18	0
30BH0624-1.5	1	1.5	32	0	0
30BH0624-2	1.5	2	20	0	0
30BH0624-2.5	2	2.5	0	0	0
30BH0624-A-0.5	0	0.5	87	0.19	0
30BH0625-0.5	0	0.5	0	0.95	0
30BH0625-1	0.5	1	81	0	0
30BH0625-1.5	1	1.5	90	0	0
30BH0625-2	1.5	2	473	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0625-2.5	2	2.5	379	0.3	0
30BH0625-3	2.5	3	32	0	0
30BH0625-3.5	3	3.5	20	0	0
30BH0625-4	3.5	4	49	0	0
30BH0625-4.5	4	4.5	0	0	0
30BH0625-A-0.5	0	0.5	0	0	0
30BH0626-0.5	0	0.5	139	0.18	0
30BH0626-1	0.5	1	225	0.33	0
30BH0626-1.5	1	1.5	207	0.16	0
30BH0626-2	1.5	2	187	0	0
30BH0626-2.5	2	2.5	131	0	0
30BH0626-3	2.5	3	54	0	0
30BH0626-3.5	3	3.5	7	0	0
30BH0626-4	3.5	4	0	0	0
30BH0626-A-0.5	0	0.5	174	0.32	0
30BH0627-0.5	0	0.5	245	0.44	0
30BH0627-1	0.5	1	238	0.9	0
30BH0627-1.5	1	1.5	95	0	0
30BH0627-2	1.5	2	44	0.04	0
30BH0627-2.5	2	2.5	6	0	0
30BH0627-3	2.5	3	0	0	0
30BH0627-3.5	3	3.5	4	0	0
30BH0627-4	3.5	4	5	0	0
30BH0627-A-0.5	0	0.5	230	0.62	0
30BH0628-0.5	0	0.5	430	0.43	0
30BH0628-1	0.5	1	802	0.46	0
30BH0628-1.5	1	1.5	80	0	0
30BH0628-2	1.5	2	26	0	0
30BH0628-2.5	2	2.5	14	0	0
30BH0628-3	2.5	3	4	0	0
30BH0628-3.5	3	3.5	6	0	0
30BH0628-4	3.5	4	0	0	0
30BH0628-A-0.5	0	0.5	246	0.28	0
30BH0629-0.5	0	0.5	220	0.49	0
30BH0629-1	0.5	1	58	0	0
30BH0629-1.5	1	1.5	60	0.16	0
30BH0629-2	1.5	2	10	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

**Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0629-2.5	2	2.5	0	0	0
30BH0629-3	2.5	3	0	0	0
30BH0629-3.5	3	3.5	0	0	0
30BH0629-4	3.5	4	5	0	0
30BH0629-A-0.5	0	0.5	147	0.11	0
30BH0630-0.5	0	0.5	331	0.58	0
30BH0630-1	0.5	1	117	0.25	0
30BH0630-1.5	1	1.5	119	0.11	0
30BH0630-2	1.5	2	31	0	0
30BH0630-2.5	2	2.5	47	0	0
30BH0630-3	2.5	3	8	0	0
30BH0630-3.5	3	3.5	0	0	0
30BH0630-4	3.5	4	0	0	0
30BH0630-A-0.5	0	0.5	198	0.39	0
30BH0631-0.5	0	0.5	109	0.26	0
30BH0631-1	0.5	1	85	0	0
30BH0631-1.5	1	1.5	145	0	0
30BH0631-2	1.5	2	279	0.72	0
30BH0631-2.5	2	2.5	270	0.56	0
30BH0631-3	2.5	3	31	0	0
30BH0631-3.5	3	3.5	49	0	0
30BH0631-A-0.5	0	0.5	245	0.06	0
30BH0632-0.5	0	0.5	664	0.82	0
30BH0632-1	0.5	1	1244	0.09	0
30BH0632-1.5	1	1.5	96	0.11	0
30BH0632-2	1.5	2	63	0	0
30BH0632-2.5	2	2.5	28	0	0
30BH0632-3	2.5	3	68	0	0
30BH0632-3.5	3	3.5	13	0	0
30BH0632-4	3.5	4	11	0	0
30BH0632-A-0.5	0	0.5	365	0.39	0
30BH0633-0.5	0	0.5	91	0	0
30BH0633-1	0.5	1	49	0	0
30BH0633-1.5	1	1.5	83	0	0
30BH0633-2	1.5	2	7	0	0
30BH0633-2.5	2	2.5	0	0	0
30BH0633-3	2.5	3	0	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

**Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0633-A-0.5	0	0.5	47	0	0
30BH0634-0.5	0	0.5	292	1.01	1.64
30BH0634-1	0.5	1	226	0.96	0
30BH0634-1.5	1	1.5	389	0.76	0
30BH0634-2	1.5	2	248	1.03	0
30BH0634-2.5	2	2.5	102	0.39	0
30BH0634-3	2.5	3	98	0	0
30BH0634-3.5	3	3.5	46	0	0
30BH0634-4	3.5	4	17	0	0
30BH0634-A-0.5	0	0.5	417	0.86	0
30BH0635-0.5	0	0.5	147	0.14	0
30BH0635-1	0.5	1	67	0	0
30BH0635-1.5	1	1.5	27	0	0
30BH0635-2	1.5	2	58	0	0
30BH0635-2.5	2	2.5	0	0	0
30BH0635-3	2.5	3	0	0	0
30BH0635-3.5	3	3.5	0	0	0
30BH0635-4	3.5	4	0	0	0
30BH0635-A-0.5	0	0.5	261	0.15	0
30BH0636-0.5	0	0.5	8	0	0
30BH0636-1	0.5	1	29	0	0
30BH0636-1.5	1	1.5	13	0	0
30BH0636-2	1.5	2	5	0	0
30BH0636-2.5	2	2.5	0	0	0
30BH0636-3	2.5	3	0	0	0
30BH0636-3.5	3	3.5	0	0	0
30BH0636-4	3.5	4	0	0	0
30BH0636-A-0.5	0	0.5	56	0	0
30BH0637-0.5	0	0.5	16	0	0
30BH0637-1	0.5	1	0	0	0
30BH0637-1.5	1	1.5	0	0	0
30BH0637-2	1.5	2	0	0	0
30BH0637-2.5	2	2.5	0	0	0
30BH0637-3	2.5	3	0	0	0
30BH0637-A-0.5	0	0.5	47	0	0
30BH0638-0.5	0	0.5	15	0	0
30BH0638-1	0.5	1	11	0	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

**Table 1-4
XRF Screening and Debris Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

FIELD Location ID	Start Depth (ft)	End Depth (ft)	XRF (ppm)	Lead Shot (g)	Clay Pigeon (g)
30BH0638-1.5	1	1.5	74	0	0
30BH0638-2	1.5	2	0	0	0
30BH0638-2.5	2	2.5	0	0	0
30BH0638-3	2.5	3	0	0	0
30BH0638-3.5	3	3.5	0	0	0
30BH0638-A-0.5	0	0.5	47	0	0
30BH0639-0.5	0	0.5	96	0.05	0
30BH0639-1	0.5	1	0	0	0
30BH0639-1.5	1	1.5	0	0	0
30BH0636-2	1.5	2	0	0	0
30BH0639-2.5	2	2.5	0	0	0
30BH0639-3	2.5	3	0	0	0
30BH0639-A-0.5	0	0.5	128	0	0
30BH0640-0.5	0	0.5	321	0.21	0
30BH0640-1	0.5	1	43	0.17	0
30BH0640-1.5	1	1.5	0	0	0
30BH0640-2	1.5	2	8	0	0
30BH0640-2.5	2	2.5	0	0	0
30BH0640-3	2.5	3	0	0	0
30BH0640-3.5	3	3.5	0	0	0
30BH0640-4	3.5	4	0	0	0
30BH0640-A-0.5	0	0.5	171	0.26	0

Bold	Detection
Yellow	>280ppm & <400ppm
Orange	>400ppm & <800ppm
Red	>800ppm

Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0641-1.0 11-May-12			30BH0642-1.0 14-May-12			30BH0643-3.0 14-May-12			30BH0644-1.5 10-May-12						
						A202666		B(a)P	A202692		B(a)P	A202692		B(a)P	A202658		B(a)P				
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A				
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Anthracene	120-12-7	17000	170000	21000	300000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Fluorene	86-73-7	2300	22000	2600	33000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Naphthalene	91-20-3	3.6	18	55	300	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Pyrene	129-00-0	1700	17000	2400	45000	<	0.035	U/	<	0.034	U/	<	0.035	U/	<	0.034	U/				
Carcinogenic PAHs^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.035	U/	0.00175	0.010	J/	0.001	<	0.035	U/	0.00175	0.013	J/	0.0013		
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.035	U/	0.0175	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.034	U/	0.017
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.035	U/	0.00175	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.034	U/	0.0017
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.035	U/	0.000175	<	0.034	U/	0.00017	<	0.035	U/	0.000175	<	0.034	U/	0.00017
Chrysene	218-01-9	15	210	(#)	(#)	<	0.035	U/	0.0000175	<	0.034	U/	0.000017	<	0.035	U/	0.0000175	<	0.034	U/	0.000017
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.035	U/	0.0175	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.034	U/	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.035	U/	0.00175	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.034	U/	0.0017
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																					
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.0404425				0.038587				0.0404425			0.038887	
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370	<	2.93	U/		<	2.68	U/		<	3.34	U/		0.715	J/		
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.93	U/		<	2.68	U/		<	3.34	U/		0.386	J/		
Copper	7440-50-8	3100	41000	150	89000		0.255	J/		<	0.67	U/			0.162	J/		<	0.583	U/	
Iron	7439-89-6	55000	720000	53000	NR		393	/			35.8	/			346	/			10.4	JB/B	
Lead	7439-92-1	400	800	400	1400		3.09	/			49.3	/			6.8	/			57.3	/	
Tin	7440-31-5	47000	610000	47000	880000		0.761	JB/B			0.663	J/B			0.839	J/B			0.558	JB/B	
Zinc	7440-66-6	23000	310000	26000	630000		1.44	J/			0.417	J/			0.969	J/		<	1.17	U/	

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0645-1.5 10-May-12		30BH0646-1.0 11-May-12		30BH0647-1.0 11-May-12		30BH0648-4.0 10-May-12									
						A202658	B(a)P TEQ ^A	A202666	B(a)P TEQ ^A	A202666	B(a)P TEQ ^A	A202658	B(a)P TEQ ^A								
						Concentration		Concentration		Concentration		Concentration									
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.034	U/	<	0.034	U/							
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.034	U/	<	0.037	U/							
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.034	U/	<	0.037	U/							
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.034	U/	<	0.037	U/							
Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/	<	0.034	U/	<	0.037	U/							
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.034	U/	<	0.034	U/		0.053	/							
Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.034	U/	<	0.034	U/		0.11	/							
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.034	U/	<	0.037	U/							
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.034	U/	<	0.037	U/							
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.034	U/	<	0.034	U/		0.043	/							
Pyrene	129-00-0	1700	17000	2400	45000	<	0.034	U/	<	0.034	U/		0.092	/							
Carcinogenic PAHs^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.010	J/	0.001		0.013	J/	0.0013		0.020	J/	0.002		0.066	/	0.0066
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.034	U/	0.017	<	0.034	U/	0.017		0.017	J/	0.017		0.078	/	0.078
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.034	U/	0.0017	<	0.034	U/	0.0017		0.025	J/	0.0025		0.1	/	0.01
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.034	U/	0.00017	<	0.034	U/	0.00017	<	0.034	U/	0.00017		0.037	/	0.00037
Chrysene	218-01-9	15	210	(#)	(#)	<	0.034	U/	0.000017	<	0.034	U/	0.000017	<	0.034	J/	0.000017		0.069	/	0.000069
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.034	U/	0.017	<	0.034	U/	0.017	<	0.037	U/	0.0185
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.034	U/	0.0017	<	0.034	U/	0.0017	<	0.034	U/	0.0017		0.044	/	0.0044
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																					
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.038587				0.038887				0.040387				0.117939
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370	<	2.04	U/			0.436	J/		<	3.06	U/			0.485	J/	
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.04	U/			<	3.07	U/		<	3.06	U/			0.632	J/
Copper	7440-50-8	3100	41000	150	89000	<	0.51	U/			<	0.767	U/		<	0.766	U/			0.374	J/
Iron	7439-89-6	55000	720000	53000	NR		14.7	B/B				26.8	/			31.2	/			161	B/
Lead	7439-92-1	400	800	400	1400		10.6	/				56.6	/			49.1	/			253	/
Tin	7440-31-5	47000	610000	47000	880000		0.503	JB/B				0.832	JB/B			0.723	JB/B			0.911	JB/B
Zinc	7440-66-6	23000	310000	26000	630000	<	1.02	U/			<	1.53	U/			0.318	J/			1.17	J/

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0648-4.0-a 10-May-12			30BH0649-3.0 10-May-12			30BH0650-1.0 10-May-12			30BH0651-1.0 15-May-12				
						A202658		B(a)P	A202658		B(a)P	A202658		B(a)P	A202738		B(a)P		
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A		
PAHs by Method 8270D SIM (mg/kg)																			
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.037	U/		<	0.034	U/		<	0.034	U/	<	0.036	U/
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.037	U/		<	0.034	U/		<	0.034	U/	<	0.036	U/
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.037	U/		<	0.034	U/		<	0.034	U/	<	0.036	U/
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.037	U/		<	0.034	U/		<	0.034	U/	<	0.036	U/
Anthracene	120-12-7	17000	170000	21000	300000	<	0.037	U/		0.069	/		<	0.034	U/		0.041	/	
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.096	/		0.23	/		<	0.034	U/		0.22	/	
Fluoranthene	206-44-0	2300	22000	3200	59000		0.14	/		0.62	/		<	0.034	U/		0.51	/	
Fluorene	86-73-7	2300	22000	2600	33000	<	0.037	U/		<	0.034	U/		<	0.034	U/	<	0.036	U/
Naphthalene	91-20-3	3.6	18	55	300	<	0.037	U/		<	0.034	U/		<	0.034	U/	<	0.036	U/
Phenanthrene	85-01-8	NR	NR	2200	36000		0.044	/		0.31	/		<	0.034	U/		0.19	/	
Pyrene	129-00-0	1700	17000	2400	45000		0.13	/		0.51	/		<	0.034	U/		0.46	/	
Carcinogenic PAHs^A (mg/kg)																			
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.11	/	0.011	0.30	/	0.03	<	0.034	U/	0.0017	0.33	/	0.033
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.14	/	0.14	0.34	/	0.34	<	0.034	U/	0.017	0.45	/	0.45
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.18	/	0.018	0.49	/	0.049	<	0.034	U/	0.0017	0.71	/	0.071
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.07	/	0.0007	0.15	/	0.0015	<	0.034	U/	0.00017	0.22	/	0.0022
Chrysene	218-01-9	15	210	(#)	(#)		0.11	/	0.00011	0.34	/	0.00034	<	0.034	U/	0.000017	0.39	/	0.00039
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.020	J/	0.02	0.048	/	0.048	<	0.034	U/	0.017	0.047	/	0.047
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.083	/	0.0083	0.20	/	0.02	<	0.034	U/	0.0017	0.20	/	0.02
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																			
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.19811			0.48884				0.039287			0.62359
Select Metals by Method 6010C (mg/kg)																			
Antimony	7440-36-0	31	410	27	370		0.354	J/		<	2.73	U/		<	3.06	U/		3050	D/
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.557	J/		<	2.73	U/		<	3.06	U/		722	/
Copper	7440-50-8	3100	41000	150	89000		0.315	J/		0.174	J/		<	0.766	U/		17.7	/	
Iron	7439-89-6	55000	720000	53000	NR		182	B/		79.7	B/			13.2	JB/B		130	/	
Lead	7439-92-1	400	800	400	1400		172	/		115	/			30.1	/		22700	D/	
Tin	7440-31-5	47000	610000	47000	880000		0.795	JB/B		0.687	JB/B			0.772	JB/B		1.05	JB/B	
Zinc	7440-66-6	23000	310000	26000	630000		1.24	J/		0.608	J/		<	1.53	U/		<	1.66	U/

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0652-1.5 11-May-12			30BH0653-3.0 11-May-12			30BH0654-2.5 11-May-12			30BH0655-1.5 10-May-12					
						A202666	B(a)P		A202666	B(a)P		A202666	B(a)P		A202658	B(a)P				
						Concentration	TEQ ^A		Concentration	TEQ ^A		Concentration	TEQ ^A		Concentration	TEQ ^A				
PAHs by Method 8270D SIM (mg/kg)																				
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/			0.03	J/	<	0.035	U/	<	0.036	U/		
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/			0.044	/	<	0.035	U/	<	0.036	U/		
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/			0.15	/	<	0.035	U/	<	0.036	U/		
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/			<	0.035	U/	<	0.035	U/	<	0.036	U/	
Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/			0.71	/	<	0.035	U/		0.031	J/		
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.052	/			1.8	/	<	0.035	U/		0.22	/		
Fluoranthene	206-44-0	2300	22000	3200	59000		0.10	/			5.7	/	<	0.035	U/		0.47	/		
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/			0.083	/	<	0.035	U/	<	0.036	U/		
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/			0.13	/	<	0.035	U/	<	0.036	U/		
Phenanthrene	85-01-8	NR	NR	2200	36000		0.037	/			3.1	/	<	0.035	U/		0.14	/		
Pyrene	129-00-0	1700	17000	2400	45000		0.091	/			4.8	/	<	0.035	U/		0.44	/		
Carcinogenic PAHs^A (mg/kg)																				
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.068	/	0.0068		3.3	/	0.33	<	0.035	U/	0.00175	0.34	/	0.034
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.088	/	0.088		3.9	/	3.9	<	0.035	U/	0.0175	0.48	/	0.48
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.13	/	0.013		5.5	/	0.55	<	0.035	U/	0.00175	0.72	/	0.072
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.041	/	0.00041		2.0	/	0.02	<	0.035	U/	0.000175	0.21	/	0.0021
Chrysene	218-01-9	15	210	(#)	(#)		0.073	/	0.000073		3.5	/	0.0035	<	0.035	U/	0.0000175	0.39	/	0.00039
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017		0.48	/	0.48	<	0.035	U/	0.0175	0.049	/	0.049
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.046	/	0.0046		1.8	/	0.18	<	0.035	U/	0.00175	0.21	/	0.021
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																				
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.129883				5.4635				0.0404425			0.65849
Select Metals by Method 6010C (mg/kg)																				
Antimony	7440-36-0	31	410	27	370		0.518	J/			<	2.92	U/		<	2.85	U/		0.629	J/
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	3.05	U/			<	2.92	U/		<	2.85	U/		0.496	J/
Copper	7440-50-8	3100	41000	150	89000		0.277	J/			0.184	J/		0.167	J/		0.527	J/		
Iron	7439-89-6	55000	720000	53000	NR		51.7	/			297	/		444	/		225	B/		
Lead	7439-92-1	400	800	400	1400		157	/			6.24	/		6.66	/		164	/		
Tin	7440-31-5	47000	610000	47000	880000		0.862	JB/B			0.811	JB/B		0.754	JB/B		0.956	JB/B		
Zinc	7440-66-6	23000	310000	26000	630000		0.784	J/			1.9	/		1.0	J/		1.78	/		

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0656-3.5 10-May-12			30BH0657-1.0 10-May-12			30BH0658-1.0 10-May-12			30BH0659-2.0 11-May-12					
						A202658		B(a)P	A202658		B(a)P	A202658		B(a)P	A202666		B(a)P			
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A			
PAHs by Method 8270D SIM (mg/kg)																				
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.034	U/	<	0.034	U/	<	0.035	U/			
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.034	U/	<	0.034	U/	<	0.035	U/			
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.034	U/	<	0.034	U/	<	0.035	U/			
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.034	U/	<	0.034	U/	<	0.035	U/			
Anthracene	120-12-7	17000	170000	21000	300000		0.038	/	<	0.034	U/	<	0.034	U/		0.078	/			
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.25	/	<	0.034	U/		0.016	J/		0.24	/			
Fluoranthene	206-44-0	2300	22000	3200	59000		0.47	/	<	0.034	U/		0.028	J/		0.76	/			
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.034	U/	<	0.034	U/	<	0.035	U/			
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.034	U/	<	0.034	U/	<	0.035	U/			
Phenanthrene	85-01-8	NR	NR	2200	36000		0.17	/	<	0.034	U/	<	0.034	U/		0.37	/			
Pyrene	129-00-0	1700	17000	2400	45000		0.42	/	<	0.034	U/		0.024	J/		0.65	/			
Carcinogenic PAHs^A (mg/kg)																				
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.28	/	0.028	<	0.034	U/	0.0017	0.025	J/	0.0025	0.40	/	0.04	
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.39	/	0.39	<	0.034	U/	0.017	0.020	J/	0.02	0.45	/	0.45	
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.55	/	0.055	<	0.034	U/	0.0017	0.032	J/	0.0032	0.67	/	0.067	
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.18	/	0.0018	<	0.034	U/	0.00017	<	0.034	U/	0.00017	0.20	/	0.002
Chrysene	218-01-9	15	210	(#)	(#)		0.32	/	0.00032	<	0.034	U/	0.000017	0.019	J/	0.000019	0.44	/	0.00044	
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.053	/	0.053	<	0.034	U/	0.017	<	0.034	U/	0.017	0.052	/	0.052
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.22	/	0.022	<	0.034	U/	0.0017	0.013	J/	0.0013	0.22	/	0.022	
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																				
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.55012				0.039287			0.044189			0.63344	
Select Metals by Method 6010C (mg/kg)																				
Antimony	7440-36-0	31	410	27	370		0.68	J/	<	2.78	U/	<	2.57	U/		0.401	J/			
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.455	J/	<	2.78	U/	<	2.57	U/		<	3.43	U/		
Copper	7440-50-8	3100	41000	150	89000		0.414	J/	<	0.696	U/	<	0.641	U/		0.216	J/			
Iron	7439-89-6	55000	720000	53000	NR		80.4	B/		11.2	JB/B		15.7	/		28.6	/			
Lead	7439-92-1	400	800	400	1400		360	/		18.5	/		117	/		157	/			
Tin	7440-31-5	47000	610000	47000	880000		0.776	JB/B		0.713	JB/B		0.663	JB/B		0.916	JB/B			
Zinc	7440-66-6	23000	310000	26000	630000		1.16	J/	<	1.39	U/	<	1.28	U/		0.595	J/			

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777		30BH0660-2.5			30BH0660-2.5-a			30BH0660-3.0			30BH0661-3.0						
				Residential Criteria SCTL	Industrial Criteria SCTL	11-May-12		11-May-12		15-May-12		10-May-12									
						A202666 Concentration	B(a)P TEQ ^A	A202666 Concentration	B(a)P TEQ ^A	A202738 Concentration	B(a)P TEQ ^A	A202658 Concentration	B(a)P TEQ ^A								
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/		<	0.034	U/		<	0.036	U/		<	0.034	U/	
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/		<	0.034	U/		<	0.036	U/		<	0.034	U/	
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/		<	0.034	U/		<	0.036	U/		<	0.034	U/	
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/		<	0.034	U/		<	0.036	U/		<	0.034	U/	
Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/		<	0.034	U/		<	0.036	U/			0.055	/	
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.036	/			0.054	/		<	0.036	U/			0.25	/	
Fluoranthene	206-44-0	2300	22000	3200	59000		0.077	/			0.11	/		<	0.036	U/			0.51	/	
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/		<	0.034	U/		<	0.036	U/		<	0.034	U/	
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/		<	0.034	U/		<	0.036	U/		<	0.034	U/	
Phenanthrene	85-01-8	NR	NR	2200	36000		0.024	J/			0.035	/		<	0.036	U/			0.23	/	
Pyrene	129-00-0	1700	17000	2400	45000		0.071	/			0.10	/		<	0.036	U/			0.44	/	
Carcinogenic PAHs^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.058	/	0.0058		0.08	/	0.008		0.015	J/	0.0015		0.3	/	0.03
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.065	/	0.065		0.11	/	0.11		0.011	J/	0.011		0.36	/	0.36
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.094	/	0.0094		0.17	/	0.017		0.018	J/	0.0018		0.51	/	0.051
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.036	/	0.00036		0.051	/	0.00051	<	0.036	U/	0.00018		0.17	/	0.0017
Chrysene	218-01-9	15	210	(#)	(#)		0.056	/	0.000056		0.088	/	0.000088	<	0.036	U/	0.000018		0.33	/	0.00033
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.034	U/	0.017	<	0.036	U/	0.018		0.049	/	0.049
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.032	J/	0.0032		0.052	/	0.0052	<	0.036	U/	0.0018		0.21	/	0.021
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																					
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.100816				0.157798				0.034298				0.51303
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370	<	3.59	U/			0.664	J/			0.353	J/B			0.379	J/	
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.475	J/			0.489	J/		<	3.02	U/			<	2.81	U/
Copper	7440-50-8	3100	41000	150	89000		0.412	J/			0.493	J/			0.293	J/			0.151	J/	
Iron	7439-89-6	55000	720000	53000	NR		78.1	/			82.7	/			145	/			52.8	B/	
Lead	7439-92-1	400	800	400	1400		189	/			189	/			75.9	/			50.7	/	
Tin	7440-31-5	47000	610000	47000	880000		0.839	JB/B			1.04	JB/J			0.763	J/B			0.7	JB/B	
Zinc	7440-66-6	23000	310000	26000	630000		9.12	/			2.5	/			1.04	J/			0.506	J/	

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0662-3.5 10-May-12		30BH0662-3.5-a 10-May-12		30BH0663-1.0 10-May-12		30BH0664-1.0 10-May-12								
						A202658	B(a)P	A202658	B(a)P	A202658	B(a)P	A202658	B(a)P							
						Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A							
PAHs by Method 8270D SIM (mg/kg)																				
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035	U/	<	0.034	U/	<	0.034	U/						
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035	U/	<	0.034	U/	<	0.034	U/						
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035	U/	<	0.034	U/	<	0.034	U/						
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035	U/	<	0.034	U/	<	0.034	U/						
Anthracene	120-12-7	17000	170000	21000	300000		0.032	J/		0.041	/	<	0.034	U/						
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.19	/J		0.34	/	<	0.034	U/						
Fluoranthene	206-44-0	2300	22000	3200	59000		0.40	/J		0.62	/	<	0.024	J/						
Fluorene	86-73-7	2300	22000	2600	33000	<	0.035	U/	<	0.034	U/	<	0.034	U/						
Naphthalene	91-20-3	3.6	18	55	300	<	0.035	U/	<	0.034	U/	<	0.034	U/						
Phenanthrene	85-01-8	NR	NR	2200	36000		0.13	/		0.17	/	<	0.034	U/						
Pyrene	129-00-0	1700	17000	2400	45000		0.36	/J		0.59	/		0.022	J/						
Carcinogenic PAHs^A (mg/kg)																				
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.26	/J	0.026	0.45	/	0.045	0.024	J/	0.0024	0.025	J/	0.0025		
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.36	/J	0.36	0.67	/	0.67	0.020	J/	0.02	0.022	J/	0.022		
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.49	/J	0.049	0.93	/	0.093	0.03	J/	0.003	0.034	/	0.0034		
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.17	/	0.0017	0.31	/	0.0031	<	0.034	U/	0.00017	0.013	J/	0.00013	
Chrysene	218-01-9	15	210	(#)	(#)		0.3	/J	0.0003	0.52	/	0.00052	0.017	J/	0.000017	0.019	J/	0.000019		
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.041	/	0.041	0.081	/	0.081	<	0.034	U/	0.017	<	0.034	U/	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.17	/	0.017	0.31	/	0.031	<	0.034	U/	0.0017	0.016	J/	0.0016	
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																				
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.495			0.92362			0.044287			0.046649		
Select Metals by Method 6010C (mg/kg)																				
Antimony	7440-36-0	31	410	27	370		0.801	J/		0.577	J/		<	3.55	U/		0.248	J/		
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.597	J/		0.62	J/		<	3.55	U/		<	2.33	U/	
Copper	7440-50-8	3100	41000	150	89000		0.562	J/		0.287	J/		<	0.887	U/		<	0.582	U/	
Iron	7439-89-6	55000	720000	53000	NR		131	B/		44.8	B/B			12	JB/B			22.7	/	
Lead	7439-92-1	400	800	400	1400		277	/J		125	/			35.2	/			102	/	
Tin	7440-31-5	47000	610000	47000	880000		0.951	JB/B		0.969	JB/B			0.807	JB/B			0.666	JB/B	
Zinc	7440-66-6	23000	310000	26000	630000		28.1	/		23.9	/		<	1.77	U/			0.224	J/	

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0665-2.5 14-May-12			30BH0666-4.5 10-May-12			30BH0667-2.5 11-May-12					
						A202692	B(a)P		A202658	B(a)P		A202666	B(a)P				
						Concentration	TEQ ^A		Concentration	TEQ ^A		Concentration	TEQ ^A				
PAHs by Method 8270D SIM (mg/kg)																	
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/		<	0.036	U/		<	0.05	U/	
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/		<	0.036	U/		<	0.05	U/	
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/		<	0.036	U/			0.060	/	
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/		<	0.036	U/		<	0.05	U/	
Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/			0.09	/			0.26	/	
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.034	U/			0.27	/			2.8	/	
Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.034	U/			0.87	/			3.2	/	
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/		<	0.036	U/		<	0.05	J/	
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/		<	0.036	U/		<	0.05	U/	
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.034	U/			0.39	/			1.2	/	
Pyrene	129-00-0	1700	17000	2400	45000	<	0.034	U/			0.72	/			3.1	/	
Carcinogenic PAHs^A (mg/kg)																	
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.014	J/	0.0014		0.41	/	0.041		2.6	/	0.26
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.0079	J/	0.0079		0.43	/	0.43		4.6	/	4.6
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.034	J/	0.0017		0.60	/	0.06		6.1	/	0.61
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.034	U/	0.00017		0.21	/	0.0021		2	/	0.02
Chrysene	218-01-9	15	210	(#)	(#)	<	0.034	U/	0.000017		0.45	/	0.00045		3.3	/	0.0033
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017		0.061	/	0.061		0.61	/	0.61
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.034	U/	0.0017		0.25	/	0.025		2.5	/	0.25
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																	
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.029887				0.61955				6.3533
Select Metals by Method 6010C (mg/kg)																	
Antimony	7440-36-0	31	410	27	370	<	2.75	U/		<	3.32	U/		<	5.09	U/	
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.75	U/		<	3.32	U/		<	5.09	U/	
Copper	7440-50-8	3100	41000	150	89000	<	0.687	U/		<	0.829	U/			3.15	/	
Iron	7439-89-6	55000	720000	53000	NR		13.5	J/			79	B/			105	/	
Lead	7439-92-1	400	800	400	1400		13.6	/			13.8	/			147	/	
Tin	7440-31-5	47000	610000	47000	880000		0.717	J/B			0.768	JB/B			1.56	JB/J	
Zinc	7440-66-6	23000	310000	26000	630000	<	1.37	U/			0.49	J/			2.94	/	

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777	62-777	30BH0668-1.0			30BH0669-3.5			30BH0670-3.0					
				Residential Criteria	Industrial Criteria	10-May-12		10-May-12		10-May-12							
				SCTL	SCTL	A202658 Concentration	B(a)P TEQ ^A	A202658 Concentration	B(a)P TEQ ^A	A202658 Concentration	B(a)P TEQ ^A						
PAHs by Method 8270D SIM (mg/kg)																	
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035	U/			0.073	/	<	0.034	U/		
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035	U/			0.091	/	<	0.034	U/		
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035	U/			0.51	/	<	0.034	U/		
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035	U/			<	0.035	U/	<	0.034	U/	
Anthracene	120-12-7	17000	170000	21000	300000	<	0.035	U/			0.60	/	<	0.034	U/		
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.014	J/			4.5	/	<	0.034	U/		
Fluoranthene	206-44-0	2300	22000	3200	59000		0.024	J/			12	D/	<	0.015	J/		
Fluorene	86-73-7	2300	22000	2600	33000	<	0.035	U/			0.10	/	<	0.034	U/		
Naphthalene	91-20-3	3.6	18	55	300	<	0.035	U/			0.25	/	<	0.034	U/		
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.035	U/			2.4	/	<	0.034	U/		
Pyrene	129-00-0	1700	17000	2400	45000		0.023	J/			12	D/	<	0.015	J/		
Carcinogenic PAHs^A (mg/kg)																	
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.024	J/	0.0024		10	D/	1	0.018	J/	0.0018	
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.021	J/	0.021		13	D/	13	0.013	J/	0.013	
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.031	J/	0.0031		21	D/	2.1	0.019	J/	0.0019	
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.035	U/	0.000175		5.4	/	0.054	<	0.034	U/	0.00017
Chrysene	218-01-9	15	210	(#)	(#)		0.017	J/	0.000017		11	D/	0.011	<	0.034	U/	0.000017
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.035	U/	0.0175		1.5	/	1.5	<	0.034	U/	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.035	J/	0.00175		5.0	/	0.5	<	0.034	U/	0.0017
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																	
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.045942				18.165			0.035587	
Select Metals by Method 6010C (mg/kg)																	
Antimony	7440-36-0	31	410	27	370	<	2.96	U/			0.79	J/	<	2.77	U/		
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.96	U/			0.303	J/	<	2.77	U/		
Copper	7440-50-8	3100	41000	150	89000	<	0.74	U/			0.19	J/	<	0.691	U/		
Iron	7439-89-6	55000	720000	53000	NR		39.6	B/B			159	B/		18.6	B/B		
Lead	7439-92-1	400	800	400	1400		47.5	/			56.2	/		62.8	/		
Tin	7440-31-5	47000	610000	47000	880000		0.737	JB/B			0.502	JB/B		0.649	JB/B		
Zinc	7440-66-6	23000	310000	26000	630000		0.729	J/			1.09	/	<	1.38	U/		

**Table 1-5
Analytical Laboratory Results: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0671-2.0 10-May-12			30BH0672-3.0 10-May-12			30BH0673-3.5 10-May-12				
						A202658		B(a)P	A202658		B(a)P	A202658		B(a)P		
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A		
PAHs by Method 8270D SIM (mg/kg)																
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035	U/	<	0.036	U/	<	0.036	U/		
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035	U/	<	0.036	U/	<	0.036	U/		
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035	U/	<	0.036	U/	<	0.036	U/		
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035	U/	<	0.036	U/	<	0.036	U/		
Anthracene	120-12-7	17000	170000	21000	300000		0.04	/		0.029	J/		0.029	J/		
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.18	/		0.11	/		0.078	/		
Fluoranthene	206-44-0	2300	22000	3200	59000		0.45	/		0.26	/		0.26	/		
Fluorene	86-73-7	2300	22000	2600	33000	<	0.035	U/	<	0.036	U/	<	0.036	U/		
Naphthalene	91-20-3	3.6	18	55	300	<	0.035	U/	<	0.036	U/	<	0.036	U/		
Phenanthrene	85-01-8	NR	NR	2200	36000		0.18	/		0.13	/		0.13	/		
Pyrene	129-00-0	1700	17000	2400	45000		0.4	/		0.23	/		0.21	/		
Carcinogenic PAHs^A (mg/kg)																
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.28	/	0.028		0.15	/	0.015	0.13	/	0.013
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.39	/	0.39		0.18	/	0.18	0.14	/	0.14
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.6	/	0.06		0.25	/	0.025	0.19	/	0.019
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.19	/	0.0019		0.092	/	0.00092	0.067	/	0.00067
Chrysene	218-01-9	15	210	(#)	(#)		0.33	/	0.00033		0.17	/	0.00017	0.14	/	0.00014
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.041	/	0.041		0.022	J/	0.022	0.017	J/	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.18	/	0.018		0.097	/	0.0097	0.071	/	0.0071
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																
B(a)P Equivalent	—	NA	NA	0.1	0.7				0.53923				0.25279			0.19691
Select Metals by Method 6010C (mg/kg)																
Antimony	7440-36-0	31	410	27	370		0.473	J/			0.42	J/		0.669	J/	
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.494	J/			0.374	J/	<	3.04	U/	
Copper	7440-50-8	3100	41000	150	89000		1.84	/			0.156	J/	<	0.76	U/	
Iron	7439-89-6	55000	720000	53000	NR		148	B/			298	B/		140	B/	
Lead	7439-92-1	400	800	400	1400		133	/			7.48	/		50.5	/	
Tin	7440-31-5	47000	610000	47000	880000		0.971	JB/B			0.715	JB/B		0.845	JB/B	
Zinc	7440-66-6	23000	310000	26000	630000		3.14	/			4.27	/		3.23	/	

Notes:

A "<" symbol indicates that the particular constituent was not detected.

Bold - indicates a detection

- Site concentrations for carcinogenic PAHs must be converted to benzo(a)pyrene equivalents before comparison with the appropriate direct exposure SCTLs for benzo(a)pyrene using the approach described in the February 2005 'Final Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C.'

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]-anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

mg/kg - milligrams per kilogram

PAH - Polynuclear Aromatic Hydrocarbons

ND - indicates a non-detection

RSL - Regional Screening Level

NR - Not Regulated under Chapter 62-777, F.A.C.

SCTL - Soil Cleanup Target Level

Table 1-6
Analytical Laboratory Results: Area B
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0677-0.5 14-May-12		30BH0678-1.0 14-May-12		30BH0679-1.0 14-May-12		30BH0680-0.5 14-May-12									
						A202692	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A								
						Concentration		Concentration		Concentration		Concentration									
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.034	U/		0.018	J/	<	0.033	U/		0.017	J/				
Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.034	U/		0.035	/	<	0.033	U/		0.027	J/				
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.034	U/	<	0.033	U/	<	0.033	U/	<	0.034	U/				
Pyrene	129-00-0	1700	17000	2400	45000	<	0.034	U/		0.032	J/	<	0.033	U/		0.023	J/				
Carcinogenic PAHs^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.034	U/	0.0017	0.029	J/	0.0029	<	0.033	U/	0.00165	0.024	J/	0.0024		
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.034	U/	0.017	0.031	J/	0.031	<	0.033	U/	0.0165	0.019	J/	0.019		
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.034	U/	0.0017	0.053	/	0.0053	<	0.033	U/	0.00165	0.032	J/	0.0032		
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.034	U/	0.00017	0.015	J/	0.00015	<	0.033	U/	0.000165	<	0.034	U/	0.00017	
Chrysene	218-01-9	15	210	(#)	(#)	<	0.034	U/	0.000017	0.027	J/	0.000027	<	0.033	U/	0.0000165	0.018	J/	0.000018		
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.033	U/	0.0165	<	0.033	U/	0.0165	<	0.034	U/	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.034	U/	0.0017	0.016	J/	0.0016	<	0.033	U/	0.00165	0.015	J/	0.0015		
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																					
B(a)P Equivalent		NA	NA	0.1	0.7				0.039287			0.057477				0.0381315			0.043288		
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370	<	2.94	U/		<	2.55	U/		<	2.03	U/		0.752	J/		
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.94	U/		<	2.55	U/		<	2.03	U/		3.33	/		
Copper	7440-50-9	3100	41000	150	89000	<	0.736	U/		0.602	J/		0.12	J/		0.909	/				
Iron	7439-89-6	55000	720000	53000	NR		31.9	/		204	/		22.9	/		3050	/				
Lead	7439-92-1	400	800	400	1400		33	/		70.2	/		10.5	/		9.74	/				
Tin	7440-51-1	47000	610000	47000	880000		0.712	J/B		0.771	J/B		0.601	J/B		0.546	J/B				
Zinc	7440-00-6	23000	310000	26000	630000		0.321	J/		2.9	/		0.226	J/		3.66	/				

Table 1-6
Analytical Laboratory Results: Area B
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0681-0.5 14-May-12		30BH0682-1.0 12-May-12		30BH0683-1.0 14-May-12		30BH0683-1.0-a 14-May-12									
						A202692	B(a)P TEQ ^A	A202695	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A								
						Concentration		Concentration		Concentration		Concentration									
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.035	U/	<	0.034	U/							
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.027	J/	<	0.035	U/	<	0.034	U/							
Fluoranthene	206-44-0	2300	22000	3200	59000		0.037	/	<	0.035	U/	<	0.034	U/							
Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.034	U/	<	0.035	U/	<	0.034	U/							
Pyrene	129-00-0	1700	17000	2400	45000		0.034	/	<	0.035	U/	<	0.034	U/							
Carcinogenic PAHs^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.034	/	0.0034	<	0.035	U/	0.00175	<	0.034	J/	0.0017	<	0.034	U/	0.0017
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.035	/	0.035	<	0.035	U/	0.0175	<	0.034	U/	0.017	<	0.034	U/	0.017
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.046	/	0.0046	<	0.035	U/	0.00175	<	0.034	U/	0.0017	<	0.034	U/	0.0017
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.020	J/	0.0002	<	0.035	U/	0.000175	<	0.034	U/	0.00017	<	0.034	U/	0.00017
Chrysene	218-01-9	15	210	(#)	(#)		0.030	J/	0.00003	<	0.035	U/	0.0000175	<	0.034	U/	0.000017	<	0.034	U/	0.000017
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.034	U/	0.017	<	0.034	U/	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.023	J/	0.0023	<	0.035	U/	0.00175	<	0.034	U/	0.0017	<	0.034	U/	0.0017
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																					
B(a)P Equivalent		NA	NA	0.1	0.7				0.06253				0.0404425				0.039287				0.039287
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370		1.02	J/		<	3.02	U/		<	3.18	U/		<	2.49	U/	
Arsenic	7440-38-2	0.39	1.6	2.1	12		6.17	/		<	3.02	U/		<	3.18	U/		<	2.49	U/	
Copper	7440-50-9	3100	41000	150	89000		1.57	/		<	0.754	U/		<	0.795	U/		<	0.621	U/	
Iron	7439-89-6	55000	720000	53000	NR		5020	/			19.8	/			27.9	J/			16.5	/	
Lead	7439-92-1	400	800	400	1400		18.4	/			9.45	/			56.9	/			41.2	/	
Tin	7440-51-1	47000	610000	47000	880000		0.39	J/B			0.972	J/B			1.15	J/B			0.944	J/B	
Zinc	7440-00-6	23000	310000	26000	630000		6.8	/			0.344	J/		<	1.59	U/			0.331	J/	

**Table 1-6
Analytical Laboratory Results: Area B
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0684-0.5 14-May-12			30BH0685-0.5 14-May-12			30BH0686-1.0 14-May-12					
						A202692		B(a)P	A202692		B(a)P	A202692		B(a)P			
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A			
PAHs by Method 8270D SIM (mg/kg)																	
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.033	U/	<	0.033	U/	<	0.036	U/			
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.033	U/	<	0.033	U/	<	0.036	U/			
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.033	U/	<	0.033	U/	<	0.036	U/			
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.033	U/	<	0.033	U/	<	0.036	UQ/			
Anthracene	120-12-7	17000	170000	21000	300000	<	0.033	U/	<	0.033	U/	<	0.036	U/			
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.020	J/		0.016	J/	<	0.036	U/			
Fluoranthene	206-44-0	2300	22000	3200	59000		0.020	J/		0.029	J/	<	0.036	U/			
Fluorene	86-73-7	2300	22000	2600	33000	<	0.033	U/	<	0.033	U/	<	0.036	U/			
Naphthalene	91-20-3	3.6	18	55	300	<	0.033	U/	<	0.033	U/	<	0.036	U/			
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.033	U/	<	0.033	U/	<	0.036	U/			
Pyrene	129-00-0	1700	17000	2400	45000		0.018	J/		0.027	J/	<	0.036	U/			
Carcinogenic PAHs^A (mg/kg)																	
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.022	J/	0.0022	0.025	J/	0.0025	<	0.036	U/	0.0018	
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.020	J/	0.02	0.026	J/	0.026	<	0.036	UQ/	0.018	
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.033	/	0.0033	0.041	/	0.0041	<	0.036	UQ/	0.0018	
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.033	U/	0.000165	<	0.033	J/	0.000165	<	0.036	U/	0.00018
Chrysene	218-01-9	15	210	(#)	(#)		0.016	J/	0.000016	0.022	J/	0.000022	<	0.036	UQ/	0.000018	
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.033	U/	0.0165	<	0.033	U/	0.0165	<	0.036	U/	0.018
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.016	J/	0.0016	0.014	J/	0.0014	<	0.036	U/	0.0018	
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																	
B(a)P Equivalent		NA	NA	0.1	0.7				0.043781			0.050687				0.041598	
Select Metals by Method 6010C (mg/kg)																	
Antimony	7440-36-0	31	410	27	370		0.449	J/		<	2.93	U/	<	2.77	U/		
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.85	U/		<	2.93	U/	<	2.77	U/		
Copper	7440-50-9	3100	41000	150	89000		0.306	J/			0.346	J/		0.171	J/		
Iron	7439-89-6	55000	720000	53000	NR		90.8	/			120	/		169	/		
Lead	7439-92-1	400	800	400	1400		56	/			30.8	/		1.89	J/		
Tin	7440-51-1	47000	610000	47000	880000		1.04	J/B			1.12	J/B		0.713	J/B		
Zinc	7440-06-6	23000	310000	26000	630000		0.969	J/			9.54	/		0.482	J/		

Notes:

A "<" symbol indicates that the particular constituent was not detected.

Bold - indicates a detection

- Site concentrations for carcinogenic PAHs must be converted to benzo(a)pyrene equivalents before comparison with the appropriate direct exposure SCTLs for benzo(a)pyrene using the approach described in the February 2005 Final Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C.'

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]-anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

mg/kg - milligrams per kilogram

PAH - Polynuclear Aromatic Hydrocarbons

ND - indicates a non-detection

RSL - Regional Screening Level

NR - Not Regulated under Chapter 62-777, F.A.C.

SCTL - Soil Cleanup Target Level

**Table 1-7
Analytical Laboratory Results: Area C
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0674-0.5 14-May-12			30BH0675-1.0 14-May-12			30BH0676-1.0 12-May-12					
						A202692		B(a)P	A202692		B(a)P	A202695		B(a)P			
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A			
PAHs by Method 8270D SIM (mg/kg)																	
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Anthracene	120-12-7	17000	170000	21000	300000	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Fluoranthene	206-44-0	2300	22000	3200	59000		0.020	J/	<	0.034	U/	<	0.086	UD/			
Fluorene	86-73-7	2300	22000	2600	33000	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Naphthalene	91-20-3	3.6	18	55	300	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.033	U/	<	0.034	U/	<	0.086	UD/			
Pyrene	129-00-0	1700	17000	2400	45000		0.017	J/	<	0.034	U/	<	0.086	UD/			
Carcinogenic PAHs^A (mg/kg)																	
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.020	J/	0.002	<	0.034	U/	0.0017	<	0.086	UD/	0.0043
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.013	J/	0.013	<	0.034	U/	0.017	<	0.086	UD/	0.043
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.019	J/	0.0019	<	0.034	U/	0.0017	<	0.086	UD/	0.0043
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.033	U/	0.000165	<	0.034	U/	0.00017	<	0.086	UD/	0.00043
Chrysene	218-01-9	15	210	(#)	(#)	<	0.033	U/	0.0000165	<	0.034	U/	0.000017	<	0.086	UD/	0.000043
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.033	U/	0.0165	<	0.034	U/	0.017	<	0.086	UD/	0.043
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.033	U/	0.00165	<	0.034	U/	0.0017	<	0.086	UD/	0.0043
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																	
B(a)P Equivalent		NA	NA	0.1	0.7				0.0352315				0.039287				0.099373
Select Metals by Method 6010C (mg/kg)																	
Antimony	7440-36-0	31	410	27	370		0.283	J/		<	2.97	U/			0.407	J/	
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.478	J/		<	2.97	U/			0.488	J/	
Copper	7440-50-8	3100	41000	150	89000		0.551	J/		<	0.743	U/			0.601	J/	
Iron	7439-89-6	55000	720000	53000	NR		263	/			10.4	J/B			978	/	
Lead	7439-92-1	400	800	400	1400		63.4	/			18	/			6.38	/	
Tin	7440-31-5	47000	610000	47000	880000		0.92	J/B			0.707	J/B			0.891	J/B	
Zinc	7440-66-6	23000	310000	26000	630000		4.1	/		<	1.49	U/			1.42	J/	

Notes:

A "<" symbol indicates that the particular constituent was not detected.

Bold - indicates a detection

- Site concentrations for carcinogenic PAHs must be converted to benzo(a)pyrene equivalents before comparison with the appropriate direct exposure SCTLs for benzo(a)pyrene using the approach described in the February 2005 'Final Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C.'

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]-anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

mg/kg - milligrams per kilogram

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

PAH - Polynuclear Aromatic Hydrocarbons

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0551-2.0 16-May-12			30BH0552-1.0 16-May-12			30BH0553-2.0 16-May-12			30BH0554-1.0 16-May-12						
						A202782		B(a)P	A202758		B(a)P	A202758		B(a)P	A202758		B(a)P				
						Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A				
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.044	U/		<	0.037	U/		<	0.035	U/	<	0.038	U/		
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.044	U/		<	0.037	U/		<	0.035	U/	<	0.038	U/		
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.044	U/		<	0.037	U/		0.039	/		<	0.038	U/		
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.044	U/		<	0.037	U/		<	0.035	U/	<	0.038	U/		
Anthracene	120-12-7	17000	170000	21000	300000		0.10	/			0.034	J/			0.30	/		0.018	J/		
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.32	/			0.19	/			0.54	/		0.29	/		
Fluoranthene	206-44-0	2300	22000	3200	59000		0.90	/			0.39	/			2.2	/		0.27	/		
Fluorene	86-73-7	2300	22000	2600	33000	<	0.044	U/		<	0.037	U/			0.051	/	<	0.038	U/		
Naphthalene	91-20-3	3.6	18	55	300	<	0.044	U/		<	0.037	U/		<	0.035	U/	<	0.038	U/		
Phenanthrene	85-01-8	NR	NR	2200	36000		0.45	/			0.15	/			1.2	/		0.095	/		
Pyrene	129-00-0	1700	17000	2400	45000		0.75	/			0.35	/			1.8	/		0.26	/		
Carcinogenic PAHs ^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.42	/	0.042		0.27	/	0.027		1.0	/	0.1		0.20	/	0.02
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.44	/	0.44		0.38	/	0.38		1.2	/	1.2		0.31	/	0.31
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.63	/	0.063		0.51	/	0.051		1.6	/	0.16		0.44	/	0.044
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.20	/	0.002		0.20	/	0.002		0.51	/	0.0051		0.16	/	0.0016
Chrysene	218-01-9	15	210	(#)	(#)		0.46	/	0.00046		0.31	/	0.00031		1.1	/	0.0011		0.24	/	0.00024
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.061	/	0.061		0.048	/	0.048		0.13	/	0.13		0.056	/	0.056
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.27	/	0.027		0.19	/	0.019		0.53	/	0.053		0.24	/	0.024
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																					
B(a)P Equivalent		NA	NA	0.1	0.7				0.63546				0.52731				1.6492				0.45584
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370		1.12	J/B		<	3.51	U/			2.06	J/B		<	3.8	U/M	
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	4.16	U/			0.484	J/			1.45	J/			0.723	J/	
Copper	7440-50-8	3100	41000	150	89000		0.44	J/			0.307	J/B			0.136	J/B			0.289	J/B	
Iron	7439-89-6	55000	720000	53000	NR		401	/			387	/			94.1	/			427	/	
Lead	7439-92-1	400	800	400	1400		8.74	/			33.6	/			91.9	/			8.16	/	
Tin	7440-31-5	47000	610000	47000	880000		1.14	J/B			0.934	J/B			0.892	J/B			1.11	J/B	
Zinc	7440-66-6	23000	310000	26000	630000		6.38	/			1.93	/			3.26	/			3.84	/	

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777	62-777	30BH0555-1.5		30BH0556-3.0		30BH0557-4.0		30BH0558-1.5								
				Residential Criteria	Industrial Criteria	16-May-12		16-May-12		16-May-12		16-May-12								
				SCTL	SCTL	A202758	B(a)P TEQ ^A	A202758	B(a)P TEQ ^A	A202738	B(a)P TEQ ^A	A202758	B(a)P TEQ ^A							
PAHs by Method 8270D SIM (mg/kg)																				
Carcinogenic PAHs ^A (mg/kg)																				
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																				
Select Metals by Method 6010C (mg/kg)																				
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.037	U/	<	0.036	U/	<	0.035	U/	<	0.038	U/			
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.037	U/	<	0.036	U/	<	0.035	U/		0.031	J/			
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.037	U/	<	0.036	U/	<	0.035	U/		0.14	/			
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.037	U/	<	0.036	U/	<	0.035	U/	<	0.038	U/			
Anthracene	120-12-7	17000	170000	21000	300000		0.028	J/		0.033	J/		0.083	/		0.81	/			
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.35	/		0.28	/		0.93	/		1.7	/			
Fluoranthene	206-44-0	2300	22000	3200	59000		0.48	/		0.37	/		0.98	/		6.8	/			
Fluorene	86-73-7	2300	22000	2600	33000	<	0.037	U/	<	0.036	U/	<	0.035	U/		0.10	/			
Naphthalene	91-20-3	3.6	18	55	300	<	0.037	U/	<	0.036	U/	<	0.035	U/		0.081	/			
Phenanthrene	85-01-8	NR	NR	2200	36000		0.14	/		0.15	/		0.38	/		3.5	/			
Pyrene	129-00-0	1700	17000	2400	45000		0.45	/		0.33	/		0.92	/		5.7	/			
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.35	/	0.035		0.24	/	0.024		0.071		3.6	/	0.36	
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.59	/	0.59		0.33	/	0.33		1.1		4.1	/	4.1	
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.89	/	0.089		0.47	/	0.047		0.14		6.2	/	0.62	
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.24	/	0.0024		0.14	/	0.0014		0.0042		2.1	/	0.021	
Chrysene	218-01-9	15	210	(#)	(#)		0.43	/	0.00043		0.28	/	0.00028		0.00085		4.0	/	0.004	
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.081	/	0.081		0.056	/	0.056		0.18		0.49	/	0.49	
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.33	/	0.033		0.23	/	0.023		0.079		1.7	/	0.17	
B(a)P Equivalent		NA	NA	0.1	0.7				0.83083				0.48168		1.57505				5.765	
Antimony	7440-36-0	31	410	27	370		1.09	J/B		<	3.51	U/		<	3.4	U/		<	3.51	U/
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.607	J/			0.772	J/		<	3.4	U/		<	3.51	U/
Copper	7440-50-8	3100	41000	150	89000		0.317	J/B		<	0.878	U/B			0.149	J/			0.326	J/B
Iron	7439-89-6	55000	720000	53000	NR		372	/			567	/			443	/			261	/
Lead	7439-92-1	400	800	400	1400		39.7	/			18.1	/			17.6	/			46.5	/
Tin	7440-31-5	47000	610000	47000	880000		1.17	J/B			0.952	J/B			0.912	J/B			1.06	J/B
Zinc	7440-66-6	23000	310000	26000	630000		1.66	J/			1.57	J/			1.34	J/			2.48	/

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0559-2.5 16-May-12			30BH0560-2.5 18-May-12			30BH0561-3.0 16-May-12			30BH0562-2.0 16-May-12			Sample ID Date Collected SDG Number																	
						A202738	B(a)P TEQ ^A		A202782	B(a)P TEQ ^A		A202782	B(a)P TEQ ^A		A202758	B(a)P TEQ ^A																			
						Concentration			Concentration			Concentration			Concentration																				
PAHs by Method 8270D SIM (mg/kg)																		PAHs by Method 8270D SI																	
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.038	U/		<	0.036	U/		<	0.035	U/		0.053	/		1-Methylnaphthalene														
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.038	U/		<	0.036	U/		<	0.035	U/		0.079	/		2-Methylnaphthalene														
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.038	U/		<	0.036	U/		<	0.035	U/		0.41	/		Acenaphthene														
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.038	U/		<	0.036	U/		<	0.035	U/		<	0.035	U/		Acenaphthylene													
Anthracene	120-12-7	17000	170000	21000	300000	<	0.038	U/		0.022	J/		<	0.035	U/			3.3	/		Anthracene														
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.14	/		0.50	/		<	0.035	U/			5.2	/		Benzo(g,h,i)perylene														
Fluoranthene	206-44-0	2300	22000	3200	59000		0.16	/		0.49	/		<	0.035	U/			27	D/		Fluoranthene														
Fluorene	86-73-7	2300	22000	2600	33000	<	0.038	U/		<	0.036	U/		<	0.035	U/		0.38	/		Fluorene														
Naphthalene	91-20-3	3.6	18	55	300	<	0.038	U/		<	0.036	U/		<	0.035	U/		0.20	/		Naphthalene														
Phenanthrene	85-01-8	NR	NR	2200	36000		0.049	/		0.14	/		<	0.035	U/			14	D/		Phenanthrene														
Pyrene	129-00-0	1700	17000	2400	45000		0.15	/		0.50	/		<	0.035	U/			22	D/		Pyrene														
Carcinogenic PAHs ^A (mg/kg)																		Carcinogenic PAHs ^A (mg/																	
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.12	/	0.012		0.41	/	0.041		0.016	J/	0.0016		14	D/	1.4	Benzo(a)anthracene													
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.16	/	0.16		0.69	/	0.69		0.011	J/	0.011		16	D/	16	Benzo(a)pyrene													
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.22	/	0.022		0.99	/	0.099		0.018	J/	0.0018		22	D/	2.2	Benzo(b)fluoranthene													
Benzo(k)fluoranthene	207-08-9	1.5	2.1	(#)	(#)		0.079	/	0.00079		0.30	/	0.003	<	0.035	U/	0.000175		7.6	D/	0.076	Benzo(k)fluoranthene													
Chrysene	218-01-9	15	210	(#)	(#)		0.13	/	0.00013		0.56	/	0.00056	<	0.035	U/	0.0000175		16	D/	0.016	Chrysene													
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.026	J/	0.026		0.11	/	0.11	<	0.035	U/	0.0175		1.7	/	1.7	Dibenzo(a,h)anthracene													
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.11	/	0.011		0.43	/	0.043	<	0.035	U/	0.00175		5.7	/	0.57	Indeno(1,2,3-cd)pyrene													
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																		Total Benzo(a)pyrene Equi																	
B(a)P Equivalent		NA	NA	0.1	0.7				0.23192				0.98656				0.0338425				21.962	B(a)P Equivalent													
Select Metals by Method 6010C (mg/kg)																		Select Metals by Method 60																	
Antimony	7440-36-0	31	410	27	370		0.313	J/B			0.318	J/B			0.553	J/B			0.309	J/B		Antimony													
Arsenic	7440-38-2	0.39	1.6	2.1	12	<	2.78	U/			<	3.12	U/		<	4.04	U/		<	3.09	U/		Arsenic												
Copper	7440-50-8	3100	41000	150	89000		0.21	J/			0.158	J/			0.307	J/			0.281	J/B		Copper													
Iron	7439-89-6	55000	720000	53000	NR		455	/			54.6	/			359	/			129	/		Iron													
Lead	7439-92-1	400	800	400	1400		15.3	/			52.2	/			31.4	/			101	/		Lead													
Tin	7440-31-5	47000	610000	47000	880000		0.698	J/B			0.823	J/B			1	J/B			0.984	J/B		Tin													
Zinc	7440-66-6	23000	310000	26000	630000		1.31	J/			0.429	J/			1.23	J/			1.89	/		Zinc													

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0563-4.0 16-May-12		30BH0564-2.5 16-May-12		30BH0565-2.0 16-May-12		30BH0566-3.0 16-May-12		Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)					
					A202758	B(a)P	A202738	B(a)P	A202758	B(a)P	A202758	B(a)P								
					Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A								
M (mg/kg)													PAHs by Method 8270D SIM (mg/kg)							
90-12-0	16	53	200	1800	0.52	D/	<	0.036	U/	<	0.035	U/	<	0.038	U/	1-Methylnaphthalene	90-12-0	16		
91-57-6	230	2200	210	2100	0.76	D/	<	0.036	U/	<	0.035	U/	<	0.038	U/	2-Methylnaphthalene	91-57-6	230		
83-32-9	3400	33000	2400	20000	3.5	D/	<	0.036	U/	<	0.035	U/	<	0.038	U/	Acenaphthene	83-32-9	3400		
208-96-8	NR	NR	1800	20000	0.048	JD/	<	0.036	U/	<	0.035	U/	<	0.038	U/	Acenaphthylene	208-96-8	NR		
120-12-7	17000	170000	21000	300000	15	D/		0.019	J/		0.091	/	<	0.038	U/	Anthracene	120-12-7	17000		
191-24-2	NR	NR	2500	52000	50	D/		0.12	/		0.34	/	<	0.038	U/	Benzo(g,h,i)perylene	191-24-2	NR		
206-44-0	2300	22000	3200	59000	130	D/		0.26	/		1.0	/	<	0.021	J/	Fluoranthene	206-44-0	2300		
86-73-7	2300	22000	2600	33000	2.7	D/	<	0.036	U/	<	0.035	U/	<	0.038	U/	Fluorene	86-73-7	2300		
91-20-3	3.6	18	55	300	2.2	D/	<	0.036	U/	<	0.035	U/	<	0.038	U/	Naphthalene	91-20-3	3.6		
85-01-8	NR	NR	2200	36000	65	D/		0.093	/		0.44	/	<	0.038	U/	Phenanthrene	85-01-8	NR		
129-00-0	1700	17000	2400	45000	120	D/		0.23	/		0.86	/	<	0.018	J/	Pyrene	129-00-0	1700		
kg)													Carcinogenic PAHs ^A (mg/kg)							
56-55-3	0.15	2.1	(#)	(#)	75	D/	7.5	0.18	/	0.018	0.58	/	0.058	0.021	J/	0.0021	Benzo(a)anthracene	56-55-3	0.15	
50-32-8	0.015	0.21	0.1	0.7	89	D/	89	0.24	/	0.24	0.69	/	0.69	0.015	J/	0.015	Benzo(a)pyrene	50-32-8	0.015	
205-99-2	0.15	2.1	(#)	(#)	120	D/	12	0.34	/	0.034	1.1	/	0.11	0.022	J/	0.0022	Benzo(b)fluoranthene	205-99-2	0.15	
207-08-9	1.5	21	(#)	(#)	41	D/	0.41	0.13	/	0.0013	0.29	/	0.0029	<	0.038	U/	0.00019	Benzo(k)fluoranthene	207-08-9	1.5
218-01-9	15	210	(#)	(#)	79	D/	0.079	0.21	/	0.00021	0.66	/	0.00066	<	0.038	U/	0.000019	Chrysene	218-01-9	15
53-70-3	0.015	0.21	(#)	(#)	12	D/	12	0.028	J/	0.028	0.089	/	0.089	<	0.038	U/	0.019	Dibenzo(a,h)anthracene	53-70-3	0.015
193-39-5	0.15	2.10	(#)	(#)	47	D/	4.7	0.11	/	0.011	0.33	/	0.033	<	0.038	U/	0.0019	Indeno(1,2,3-cd)pyrene	193-39-5	0.15
ivalent Concentration ^A (mg/kg)													Total Benzo(a)pyrene Equivalent Concentration ^A (n							
	NA	NA	0.1	0.7			125.689			0.33251			0.98356			0.040409	B(a)P Equivalent		NA	
010C (mg/kg)													Select Metals by Method 6010C (mg/kg)							
7440-36-0	31	410	27	370	2.24	J/B		0.506	J/B	<	2.64	U/		0.789	J/B		Antimony	7440-36-0	31	
7440-38-2	0.39	1.6	2.1	12	1.48	J/	<	3.57	U/	<	2.64	U/		0.714	J/		Arsenic	7440-38-2	0.39	
7440-50-8	3100	41000	150	89000	1.21	/		3.23	/		0.18	J/B		0.241	J/B		Copper	7440-50-8	3100	
7439-89-6	55000	720000	53000	NR	301	/		199	/		102	/		411	/		Iron	7439-89-6	55000	
7439-92-1	400	800	400	1400	332	/		65.3	/		127	/		74.9	/		Lead	7439-92-1	400	
7440-31-5	47000	610000	47000	880000	1.3	J/B		0.991	J/B		0.655	J/B		1.07	J/B		Tin	7440-31-5	47000	
7440-66-6	23000	310000	26000	630000	13.7	/		1.21	J/		0.788	J/		0.979	J/		Zinc	7440-66-6	23000	

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0567-4.0 16-May-12		30BH0568-2.5 16-May-12		30BH0568-2.5-a 16-May-12		30BH0569-2.5 18-May-12		Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL												
			A202738	B(a)P TEQ ^A	A202738	B(a)P TEQ ^A	A202738	B(a)P TEQ ^A	A202782	B(a)P TEQ ^A																	
			Concentration		Concentration		Concentration		Concentration																		
PAHs by Method 8270D SIM (mg/kg)																											
53	200	1800	<	0.036	U/	<	0.037	U/	<	0.036	U/		0.027	J/		1-Methylnaphthalene	90-12-0	16	53	200							
2200	210	2100	<	0.036	U/	<	0.037	U/	<	0.036	U/		0.048	/		2-Methylnaphthalene	91-57-6	230	2200	210							
33000	2400	20000	<	0.036	U/		0.037	/		0.050	/		0.16	/		Acenaphthene	83-32-9	3400	33000	2400							
NR	1800	20000	<	0.036	U/	<	0.037	U/	<	0.036	U/	<	0.037	U/		Acenaphthylene	208-96-8	NR	NR	1800							
170000	21000	300000		0.13	/		0.21	/J		0.34	/		0.39	/		Anthracene	120-12-7	17000	170000	21000							
NR	2500	52000		0.97	/		0.68	/J/		1.2	/		2.1	/		Benzo(g,h,i)perylene	191-24-2	NR	NR	2500							
22000	3200	59000		1.5	/		1.9	/J		3.2	/		4.1	/		Fluoranthene	206-44-0	2300	22000	3200							
22000	2600	33000	<	0.036	U/		0.03	J/		0.033	J/		0.14	/		Fluorene	86-73-7	2300	22000	2600							
18	55	300	<	0.036	U/	<	0.037	U/	<	0.036	U/		0.16	/		Naphthalene	91-20-3	3.6	18	55							
NR	2200	36000		0.56	/		0.89	/J		1.5	/		1.3	/		Phenanthrene	85-01-8	NR	NR	2200							
17000	2400	45000		1.4	/		1.6	/J		2.7	/		4	/		Pyrene	129-00-0	1700	17000	2400							
Carcinogenic PAHs ^A (mg/kg)																											
2.1	(#)	(#)		1.1	/	0.11		1.1	/J	0.11		1.9	/	0.19		3.8	/	0.38				Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	
0.21	0.1	0.7		1.4	/	1.4		1.3	/J	1.3		2.3	/	2.3		4.7	/	4.7				Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	
2.1	(#)	(#)		2.0	/	0.2		1.7	/J	0.17		3.4	/	0.34		5.9	/	0.59				Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	
21	(#)	(#)		0.57	/	0.0057		0.62	/J	0.0062		1.0	/	0.01		2.2	/	0.022				Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	
210	(#)	(#)		1.2	/	0.0012		1.1	/J	0.0011		2.1	/	0.0021		3.8	/	0.0038				Chrysene	218-01-9	15	210	(#)	
0.21	(#)	(#)		0.22	/	0.22		0.14	/	0.14		0.26	/	0.26		0.64	/	0.64				Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	
2.10	(#)	(#)		0.87	/	0.087		0.61	/J	0.061		1.1	/	0.11		2.1	/	0.21				Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	
ng/kg																											
NA	0.1	0.7				2.0239				1.7883				3.2121				6.5458				Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)					
B(a)P Equivalent																											
																											0.1
Select Metals by Method 6010C (mg/kg)																											
410	27	370	<	2.99	U/			0.501	J/B			0.627	J/B			0.529	J/B					Antimony	7440-36-0	31	410	27	
1.6	2.1	12	<	2.99	U/			<	3.13	U/		<	3.85	U/		<	3.63	U/					Arsenic	7440-38-2	0.39	1.6	2.1
41000	150	89000		0.489	J/				0.452	J/			0.333	J/			0.716	J/					Copper	7440-50-8	3100	41000	150
720000	53000	NR		337	/				96.7	/			93.4	/			598	/					Iron	7439-89-6	55000	720000	53000
800	400	1400		6.77	/				321	/			248	/			82.4	/					Lead	7439-92-1	400	800	400
610000	47000	880000		0.775	J/B				0.752	J/B			1.06	J/B			1.02	J/B					Tin	7440-31-5	47000	610000	47000
310000	26000	630000		8.02	/				1.36	J/			1.05	J/			2.19	/					Zinc	7440-66-6	23000	310000	26000

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

62-777 Industrial Criteria SCTL	30BH0570-1.0 16-May-12			30BH0571-3.0 16-May-12			30BH0572-2.0 16-May-12			30BH0573-1.0 15-May-12			Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH 16- A202738 Concentrat			
	A202738		B(a)P	A202738		B(a)P	A202758		B(a)P	A202716		B(a)P										
	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A										
PAHs by Method 8270D SIM (mg/kg)																						
1800	<	0.036	U/	<	0.035	U/	<	0.038	U/		0.045	/		1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.036	
2100	<	0.036	U/	<	0.035	U/	<	0.038	U/		0.077	/		2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.036	
20000	<	0.036	U/	<	0.035	U/	<	0.038	U/		0.24	/		Acenaphthene	83-32-9	3400	33000	2400	20000		0.033	
20000	<	0.036	U/	<	0.035	U/	<	0.038	U/	<	0.035	U/		Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.036	
300000		0.019	J/	<	0.035	U/	<	0.038	U/		0.62	/		Anthracene	120-12-7	17000	170000	21000	300000		0.25	
52000		0.25	/		0.023	J/	<	0.038	U/		1.7	/		Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.74	
59000		0.24	/		0.036	J/	<	0.038	U/		4.0	/		Fluoranthene	206-44-0	2300	22000	3200	59000		2.3	
33000	<	0.036	U/	<	0.035	U/	<	0.038	U/		0.16	/		Fluorene	86-73-7	2300	22000	2600	33000		0.032	
300	<	0.036	U/	<	0.035	U/	<	0.038	U/		0.29	/		Naphthalene	91-20-3	3.6	18	55	300	<	0.036	
36000		0.085	/	<	0.035	U/	<	0.038	U/		2.3	/		Phenanthrene	85-01-8	NR	NR	2200	36000		1.1	
45000		0.23	/		0.032	J/	<	0.038	U/		3.6	/		Pyrene	129-00-0	1700	17000	2400	45000		1.9	
Carcinogenic PAHs ^A (mg/kg)																						
(#)		0.19	/	0.019		0.030	J/	0.003	<	0.038	U/	0.0019		Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		1.2	
0.7		0.29	/	0.29		0.026	J/	0.026	<	0.038	U/	0.019		Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		1.5	
(#)		0.4	/	0.04		0.039	/	0.0039	<	0.038	U/	0.0019		Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		2.1	
(#)		0.14	/	0.0014		0.015	J/	0.00015	<	0.038	U/	0.00019		Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.76	
(#)		0.23	/	0.00023		0.026	J/	0.000026	<	0.038	U/	0.000019		Chrysene	218-01-9	15	210	(#)	(#)		1.4	
(#)		0.048	/	0.048	<	0.035	U/	0.0175	<	0.038	U/	0.019		Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.17	
(#)		0.21	/	0.021		0.017	J/	0.0017	<	0.038	U/	0.0019		Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.67	
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																						
0.7				0.41963				0.052276				0.043909					NA	NA	0.1	0.7		
Select Metals by Method 6010C (mg/kg)																						
370		0.398	J/B			0.388	J/B		<	3.35	U/			Antimony	7440-36-0	31	410	27	370		0.398	
12		0.723	J/			<	3.49	U/		0.664	J/	<	3.52	U/	Arsenic	7440-38-2	0.39	1.6	2.1	12		0.427
89000		1.5	/			<	0.874	U/		0.351	J/B			Copper	7440-50-8	3100	41000	150	89000		0.189	
NR		2050	/				69.5	/		338	/			Iron	7439-89-6	55000	720000	53000	NR		69.8	
1400		17.6	/				67.7	/		97.3	/			Lead	7439-92-1	400	800	400	1400		181	
880000		0.94	J/B				0.915	J/B			0.995	J/B		Tin	7440-31-5	47000	610000	47000	880000		0.805	
630000		2.17	/		<	1.75	U/			1.12	J/			Zinc	7440-66-6	23000	310000	26000	630000		0.581	

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Location	30BH0575-3.0 16-May-12		30BH0576-3.0 16-May-12		30BH0577-1.5 16-May-12		Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0578-1.0 16-May-12												
	B(a)P TEQ ^A	A202738 Concentration	B(a)P TEQ ^A	A202738 Concentration	B(a)P TEQ ^A	A202738 Concentration							B(a)P TEQ ^A	A202758 Concentration		B(a)P TEQ ^A									
PAHs by Method 8270D SIM (mg/kg)																									
U/	<	0.037	U/	<	0.037	U/	<	0.038	U/	1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.036	U/	<						
U/	<	0.037	U/	<	0.037	U/	<	0.038	U/	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.036	U/	<						
J/	<	0.037	U/	<	0.037	U/	<	0.038	U/	Acenaphthene	83-32-9	3400	33000	2400	20000		0.043	/	<						
U/	<	0.037	U/	<	0.037	U/	<	0.038	U/	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.036	U/	<						
/	<	0.037	U/		0.026	J/		0.04	/	Anthracene	120-12-7	17000	170000	21000	300000		0.033	J/	<						
/		0.016	J/		0.20	/		0.26	/	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		1.1	/	<						
/		0.030	J/		0.34	/		0.48	J-DOD/	Fluoranthene	206-44-0	2300	22000	3200	59000		1.3	/	<						
J/	<	0.037	U/	<	0.037	U/	<	0.038	U/	Fluorene	86-73-7	2300	22000	2600	33000	<	0.036	U/	<						
U/	<	0.037	U/	<	0.037	U/	<	0.038	U/	Naphthalene	91-20-3	3.6	18	55	300	<	0.036	U/	<						
/	<	0.037	U/		0.12	/		0.19	/	Phenanthrene	85-01-8	NR	NR	2200	36000		0.21	/	<						
/		0.027	J/		0.31	/		0.41	/	Pyrene	129-00-0	1700	17000	2400	45000		1.3	/	<						
Carcinogenic PAHs ^A (mg/kg)																									
/	0.12		0.027	J/	0.0027		0.26	/	0.026		0.28	/	0.028	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.94	/	0.094		
/	1.5		0.027	J/	0.027		0.39	/	0.39		0.32	/	0.32	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		1.4	/	1.4		
/	0.21		0.038	/	0.0038		0.59	/	0.059		0.48	/	0.048	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		2	/	0.2		
/	0.0076	<	0.037	J/	0.000185		0.17	/	0.0017		0.14	/	0.0014	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.56	/	0.0056	<	
/	0.0014		0.022	J/	0.000022		0.31	/	0.00031		0.32	/	0.00032	Chrysene	218-01-9	15	210	(#)	(#)		1.2	/	0.0012		
/	0.17	<	0.037	U/	0.0185		0.044	/	0.044		0.046	/	0.046	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.21	/	0.21	<	
/	0.067		0.015	J/	0.0015		0.18	/	0.018		0.21	/	0.021	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.94	/	0.094		
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																									
	2.076				0.053707				0.53901				0.46472	B(a)P Equivalent		NA	NA	0.1	0.7					2.0048	
Select Metals by Method 6010C (mg/kg)																									
J/B			0.343	J/B			0.751	J/B			0.3	QM-0/M		Antimony	7440-36-0	31	410	27	370		0.539	J/B			
J/	<	3.59	U/	<	3.58	U/					0.861	J/		Arsenic	7440-38-2	0.39	1.6	2.1	12		0.771	J/			
J/			0.29	J/			0.225	J/			1.87	/		Copper	7440-50-8	3100	41000	150	89000		0.414	J/B			
/			407	/			115	/			1990	QM-02/		Iron	7439-89-6	55000	720000	53000	NR		157	/			
/			78.3	/			65.6	/			24.8	/		Lead	7439-92-1	400	800	400	1400		163	/			
J/B			0.974	J/B			0.947	J/B			0.918	J/B		Tin	7440-31-5	47000	610000	47000	880000		0.707	J/B			
J/			1.19	J/			0.626	J/			2.01	/		Zinc	7440-66-6	23000	310000	26000	630000		0.918	J/			

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

30BH0578-1.0-a 16-May-12		30BH0579-2.0 15-May-12		30BH0580-3.5 15-May-12		Sample ID Date Collected	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria	62-777 Industrial Criteria	30BH0581-2.5 16-May-12		30BH0582-1 16-May-12							
A202758 Concentration	B(a)P TEQ ^A	A202716 Concentration	B(a)P TEQ ^A	A202716 Concentration	B(a)P TEQ ^A	SDG Number				SCTL	SCTL	A202738 Concentration	B(a)P TEQ ^A	A202738 Concentration							
PAHs by Method 8270D SIM (mg/kg)																					
0.035	U/	<	0.036	U/	<	0.035	U/	90-12-0	16	53	200	1800	<	0.038	U/	<	0.037	U/			
0.035	U/	<	0.036	U/	<	0.035	U/	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.038	U/	<	0.037	U/		
0.035	U/	<	0.036	U/	<	0.035	U/	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.038	U/		0.081	/		
0.035	U/	<	0.036	U/	<	0.035	U/	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.038	U/	<	0.037	U/		
0.035	U/	<	0.036	U/	<	0.035	U/	Anthracene	120-12-7	17000	170000	21000	300000	<	0.038	U/		0.39	/		
0.028	J/	<	0.036	U/		0.17	/	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.020	J/		1.6	/		
0.029	J/		0.017	J/		0.27	/	Fluoranthene	206-44-0	2300	22000	3200	59000		0.041	/		4.3	/		
0.035	U/	<	0.036	U/	<	0.035	U/	Fluorene	86-73-7	2300	22000	2600	33000	<	0.038	U/		0.048	/		
0.035	U/	<	0.036	U/	<	0.035	U/	Naphthalene	91-20-3	3.6	18	55	300	<	0.038	U/		0.05	/		
0.035	U/	<	0.036	U/		0.062	/	Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.038	U/		1.7	/		
0.025	J/		0.016	J/		0.25	/	Pyrene	129-00-0	1700	17000	2400	45000		0.038	/		3.8	/		
Carcinogenic PAHs ^A (mg/kg)																					
0.025	J/	0.0025		0.020	J/	0.002		Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.036	J/	0.0036		2.7	/	
0.022	J/	0.022		0.016	J/	0.016		Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.034	J/	0.034		3.6	/	
0.038	/	0.0038		0.028	J/	0.0028		Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.051	/	0.0051		5.1	/	
0.035	U/	0.000175	<	0.036	U/	0.00018		Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.018	J/	0.00018		1.8	/	
0.019	J/	0.000019	<	0.036	U/	0.000018		Chrysene	218-01-9	15	210	(#)	(#)		0.030	J/	0.00003		3.1	/	
0.035	U/	0.0175	<	0.036	U/	0.018		Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.038	U/	0.019		0.39	/	
0.020	J/	0.002	<	0.036	U/	0.0018		Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.016	J/	0.0016		1.6	/	
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																					
		0.047994				0.040798		B(a)P Equivalent		NA	NA	0.1	0.7				0.06351				
Select Metals by Method 6010C (mg/kg)																					
0.674	J/B			0.47	J/B		<	3.24	U/	Antimony	7440-36-0	31	410	27	370	<	3.77	U/		1.63	J/
0.653	J/		<	3.16	U/		<	3.24	U/	Arsenic	7440-38-2	0.39	1.6	2.1	12		0.537	J/		0.795	J/
0.416	J/B			0.367	J/B			0.221	J/B	Copper	7440-50-8	3100	41000	150	89000		0.237	J/		0.919	J/
164	/			304	/			177	/	Iron	7439-89-6	55000	720000	53000	NR		123	/		469	/
155	/			43	/			15.3	/	Lead	7439-92-1	400	800	400	1400		131	/		240	/
0.995	J/B			1.06	J/B			0.749	J/B	Tin	7440-31-5	47000	610000	47000	880000		1.02	J/B		1.09	J/B
1.05	J/			1.26	J/			0.795	J/	Zinc	7440-66-6	23000	310000	26000	630000		0.682	J/		3.24	/

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID SDG Number	30BH0583-2.0 16-May-12			30BH0583-2.0-a 16-May-12			Date Collected	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0584-2.0 16-May-12		30BH0585-3.0 17-May-12		30BH 17- A202758 Concentrat		
	B(a)P TEQ ^A	A202758 Concentration	B(a)P TEQ ^A	A202758 Concentration	B(a)P TEQ ^A	A202758 Concentration							B(a)P TEQ ^A	A202758 Concentration	B(a)P TEQ ^A	A202758 Concentration			
	<	0.037	U/	<	0.036	U/							<	0.039	U/	<		0.037	U/
PAHs by Method 8270D SIM (mg/kg)																			
	<	0.037	U/		<	0.036	U/	1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.039	U/		<	0.036
	<	0.037	U/		<	0.036	U/	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.039	U/		<	0.036
	<	0.037	U/		<	0.036	U/	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.039	U/		<	0.036
	<	0.037	U/		<	0.036	U/	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.039	U/		<	0.036
	<	0.037	U/		<	0.036	U/	Anthracene	120-12-7	17000	170000	21000	300000		0.045	/		<	0.036
	0.032	J/		0.11	/			Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.59	/		<	0.036
	0.044	/		0.18	/			Fluoranthene	206-44-0	2300	22000	3200	59000		0.57	/		<	0.036
	<	0.037	U/		<	0.036	U/	Fluorene	86-73-7	2300	22000	2600	33000	<	0.039	U/		<	0.036
	<	0.037	U/		<	0.036	U/	Naphthalene	91-20-3	3.6	18	55	300	<	0.039	U/		<	0.036
	<	0.037	U/		0.065	/		Phenanthrene	85-01-8	NR	NR	2200	36000		0.20	/		<	0.036
	0.040	/		0.15	/			Pyrene	129-00-0	1700	17000	2400	45000		0.55	/		<	0.036
Carcinogenic PAHs^A (mg/kg)																			
0.27	0.036	J/	0.0036	0.11	/	0.011		Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.49	/	0.049	<	0.037
3.6	0.037	/	0.037	0.13	/	0.13		Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.74	/	0.74	<	0.037
0.51	0.055	/	0.0055	0.20	/	0.02		Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		1.0	/	0.1	<	0.037
0.018	0.017	J/	0.00017	0.061	/	0.00061		Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.32	/	0.0032	<	0.037
0.0031	0.031	J/	0.000031	0.13	/	0.00013		Chrysene	218-01-9	15	210	(#)	(#)		0.57	/	0.00057	<	0.037
0.39	<	0.037	U/	0.0185	0.021	J/	0.021	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.13	/	0.13	<	0.037
0.16	0.025	J/	0.0025	0.094	/	0.0094		Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.50	/	0.05	<	0.037
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																			
4.9511			0.067301			0.19214		B(a)P Equivalent		NA	NA	0.1	0.7				1.07277		0.0427535
Select Metals by Method 6010C (mg/kg)																			
	0.433	J/B		1.03	J/B			Antimony	7440-36-0	31	410	27	370	<	3.78	U/		<	2.18
	0.784	J/		0.742	J/			Arsenic	7440-38-2	0.39	1.6	2.1	12	<	3.78	U/		0.557	J/
	0.766	/B/		0.718	J/B			Copper	7440-50-8	3100	41000	150	89000		0.931	J/B		0.125	J/B
	885	/		963	/			Iron	7439-89-6	55000	720000	53000	NR		973	/		191	/
	170	/		179	/			Lead	7439-92-1	400	800	400	1400		70.7	/		10	/
	0.975	J/B		1.14	J/B			Tin	7440-31-5	47000	610000	47000	880000		1.2	J/B		0.574	J/B
	1.75	/		1.76	J/			Zinc	7440-66-6	23000	310000	26000	630000		3.56	/		0.845	J/

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0588-0.5 15-May-12		30BH0589-1.0 15-May-12		30BH0590-3.0 15-May-12												
						A202716	B(a)P	A202716	B(a)P	A202716	B(a)P											
						Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A											
PAHs by Method 8270D SIM (mg/kg)																						
U/	<	0.035	U/	1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
U/	<	0.035	U/	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
U/	<	0.035	U/	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
U/	<	0.035	U/	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
U/		0.029	J/	Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
J/		0.16	/	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.047	/		0.05	/	<	0.034	U/	<			
J/		0.31	/	Fluoranthene	206-44-0	2300	22000	3200	59000		0.078	/		0.11	/	<	0.034	U/	<			
U/	<	0.035	U/	Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
U/	<	0.035	U/	Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.042	U/	<	0.034	U/	<			
U/		0.14	/	Phenanthrene	85-01-8	NR	NR	2200	36000		0.026	J/		0.049	/	<	0.034	U/	<			
J/		0.27	/	Pyrene	129-00-0	1700	17000	2400	45000		0.072	/		0.099	/	<	0.034	U/	<			
Carcinogenic PAHs ^A (mg/kg)																						
J/	0.0026	0.17	/	0.017	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	0.054	/	0.0054	0.081	/	0.0081	0.013	J/	0.0013			
J/	0.021	0.20	/	0.2	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	0.073	/	0.073	0.099	/	0.099	<	0.034	U/	0.017		
J/	0.0034	0.28	/	0.028	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	0.11	/	0.011	0.16	/	0.016	<	0.034	U/	0.0017		
U/	0.00018	0.10	/	0.001	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	0.042	/	0.00042	0.047	/	0.00047	<	0.034	U/	0.00017		
J/	0.00002	0.19	/	0.00019	Chrysene	218-01-9	15	210	(#)	(#)	0.060	/	0.00006	0.085	/	0.000085	<	0.034	U/	0.000017		
U/	0.018	0.031	J/	0.031	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.042	U/	0.021	<	0.034	U/	0.017
J/	0.0015	0.13	/	0.013	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	0.038	/	0.0038	0.047	/	0.0047	<	0.034	U/	0.0017		
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																						
	0.0467			0.29019	B(a)P Equivalent		NA	NA	0.1	0.7			0.11068			0.149355			0.038887			
Select Metals by Method 6010C (mg/kg)																						
J/B		0.347	J/B		Antimony	7440-36-0	31	410	27	370	0.451	J/B		0.436	J/B		0.234	J/B		<		
U/		0.534	J/		Arsenic	7440-38-2	0.39	1.6	2.1	12	0.37	J/		0.664	J/		<	2.07	U/	<		
J/B		0.403	J/B		Copper	7440-50-8	3100	41000	150	89000	0.679	/B/		1.24	/B/		<	0.518	U/	<		
/		445	/		Iron	7439-89-6	55000	720000	53000	NR	627	/		925	/		<	65	/	<		
/		48.8	/		Lead	7439-92-1	400	800	400	1400	78.6	/		30.9	/		<	62.5	/	<		
J/B		0.995	J/B		Tin	7440-31-5	47000	610000	47000	880000	0.974	J/B		1.44	J/B		<	0.521	J/B	<		
J/		1.32	/		Zinc	7440-66-6	23000	310000	26000	630000	1.86	/		2.36	/		<	0.339	J/	<		

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

30BH0591-3.5 16-May-12		Sample ID	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0592-3.0 17-May-12		30BH0593-2.5 17-May-12		30BH0594-2.5 17-May-12		30BH0595-1 17-May-12									
A202738 Concentration	B(a)P TEQ ^A	Date Collected SDG Number						A202758 Concentration	B(a)P TEQ ^A	A202782 Concentration	B(a)P TEQ ^A	A202758 Concentration	B(a)P TEQ ^A	A202758 Concentration	B(a)P TEQ ^A								
PAHs by Method 8270D SIM (mg/kg)																							
0.034	U/		1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.036	U/	<	0.041	U/	<	0.035	U/						
0.034	U/		2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.036	U/	<	0.041	U/	<	0.035	U/						
0.034	U/		Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.036	U/	<	0.041	U/	<	0.035	U/						
0.034	U/		Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.036	U/	<	0.041	U/	<	0.035	U/						
0.034	U/		Anthracene	120-12-7	17000	170000	21000	300000	<	0.036	U/	<	0.041	U/	<	0.035	U/						
0.078	/		Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.036	U/	0.021	J/	<	0.035	U/	<	0.035	U/				
0.19	/		Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.036	U/	0.046	/	<	0.035	U/	<	0.035	U/				
0.034	U/		Fluorene	86-73-7	2300	22000	2600	33000	<	0.036	U/	<	0.041	U/	<	0.035	U/	<	0.035	U/			
0.034	U/		Naphthalene	91-20-3	3.6	18	55	300	<	0.036	U/	<	0.041	U/	<	0.035	U/	<	0.035	U/			
0.062	/		Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.036	U/	<	0.041	U/	<	0.035	U/	<	0.035	U/			
0.18	/		Pyrene	129-00-0	1700	17000	2400	45000	<	0.036	U/	0.039	J/	<	0.035	U/	<	0.035	U/				
Carcinogenic PAHs ^A (mg/kg)																							
0.14	/	0.014	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.036	U/	0.0018	0.034	J/	0.0034	0.013	J/	0.0013	0.017	J/			
0.17	/	0.17	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.036	U/	0.018	0.030	J/	0.03	0.0084	J/	0.0084	0.010	J/			
0.23	/	0.023	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.036	U/	0.0018	0.051	/	0.0051	<	0.035	U/	0.00175	0.015	J/		
0.089	/	0.00089	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.036	U/	0.00018	<	0.041	J/	0.000205	<	0.035	U/	0.000175	<	0.035	U/
0.15	/	0.00015	Chrysene	218-01-9	15	210	(#)	(#)	<	0.036	U/	0.000018	0.028	J/	0.000028	<	0.035	U/	0.0000175	<	0.035	U/	
0.017	J/	0.017	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.036	U/	0.018	<	0.041	U/	0.0205	<	0.035	U/	0.0175	<	0.035	U/
0.076	/	0.0076	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.036	U/	0.0018	0.018	J/	0.0018	<	0.035	U/	0.00175	<	0.035	U/	
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																							
		0.23264	B(a)P Equivalent		NA	NA	0.1	0.7				0.041598			0.061033			0.0308925					
Select Metals by Method 6010C (mg/kg)																							
2.82	U/		Antimony	7440-36-0	31	410	27	370	<	3.85	U/		0.479	J/B	<	2.74	U/		0.371	J/B			
2.82	U/		Arsenic	7440-38-2	0.39	1.6	2.1	12	<	3.85	U/		0.567	J/	<	2.74	U/		<	3.37	U/		
0.705	U/		Copper	7440-50-8	3100	41000	150	89000	<	0.963	U/		2.75	/		0.548	J/B		<	0.842	U/		
122	/		Iron	7439-89-6	55000	720000	53000	NR		490	/		437	/		79.8	/			155	/		
60.5	/		Lead	7439-92-1	400	800	400	1400		38.1	/		107	/		102	/			94.5	/		
0.757	J/B		Tin	7440-31-5	47000	610000	47000	880000		1.01	J/B		1.06	J/B		0.833	J/B			0.82	J/B		
0.31	J/		Zinc	7440-66-6	23000	310000	26000	630000		1.09	J/		10.6	/		0.738	J/			0.342	J/		

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

.5	Sample ID	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0596-0.5 15-May-12		30BH0597-1.0 15-May-12		30BH0598-3.0 15-May-12		30BH0599-2.5 15-May-12									
	Date Collected						A202716	B(a)P TEQ ^A	A202716	B(a)P TEQ ^A	A202716	B(a)P TEQ ^A	A202716	B(a)P TEQ ^A								
	SDG Number	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration									
PAHs by Method 8270D SIM (mg/kg)																						
	1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	Anthracene	120-12-7	17000	170000	21000	300000	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.33	/	<	0.17	UD/	<	0.036	U/		0.09	/				
	Fluoranthene	206-44-0	2300	22000	3200	59000		0.18	/	<	0.17	UD/	<	0.036	U/		0.11	/				
	Fluorene	86-73-7	2300	22000	2600	33000	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	Naphthalene	91-20-3	3.6	18	55	300	<	0.035	U/	<	0.17	UD/	<	0.036	U/	<	0.035	U/				
	Phenanthrene	85-01-8	NR	NR	2200	36000		0.045	/	<	0.17	UD/	<	0.036	U/		0.037	/				
	Pyrene	129-00-0	1700	17000	2400	45000		0.19	/	<	0.17	UD/	<	0.036	U/		0.1	/				
Carcinogenic PAHs ^A (mg/kg)																						
0.0017	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.20	/	0.02		0.072	JD/	0.0072	<	0.036	U/	0.0018		0.083	/	0.0083
0.01	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.44	/	0.44		0.043	JD/	0.043	<	0.036	U/	0.018		0.10	/	0.1
0.0015	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.62	/	0.062	<	0.17	UD/	0.0085	<	0.036	U/	0.0018		0.16	/	0.016
0.000175	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.17	/	0.0017	<	0.17	UD/	0.00085	<	0.036	U/	0.00018		0.046	/	0.00046
0.0000175	Chrysene	218-01-9	15	210	(#)	(#)		0.28	/	0.00028	<	0.17	UD/	0.000085	<	0.036	U/	0.000018		0.090	/	0.00009
0.0175	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)		0.065	/	0.065	<	0.17	UD/	0.085	<	0.036	U/	0.018		0.017	J/	0.017
0.00175	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.27	/	0.027	<	0.17	UD/	0.0085	<	0.036	U/	0.0018		0.07	/	0.007
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																						
0.0326425	B(a)P Equivalent		NA	NA	0.1	0.7				0.61598				0.153135				0.041598				0.14885
Select Metals by Method 6010C (mg/kg)																						
	Antimony	7440-36-0	31	410	27	370		0.623	J/B			0.702	J/B	<	2.96	U/			0.697	J/		
	Arsenic	7440-38-2	0.39	1.6	2.1	12		1.72	J/			0.895	J/		0.428	J/			0.918	J/		
	Copper	7440-50-8	3100	41000	150	89000		0.725	J/B			0.491	J/B		0.193	J/B			0.598	J/B		
	Iron	7439-89-6	55000	720000	53000	NR		1850	/			1270	/		241	/			664	/J/		
	Lead	7439-92-1	400	800	400	1400		14.2	/			20.3	/		5.33	/			171	/J/		
	Tin	7440-31-5	47000	610000	47000	880000		0.638	J/B		<	2.88	U/		0.896	J/B			1.08	J/B		
	Zinc	7440-66-6	23000	310000	26000	630000		3.25	/			2	/		1.03	J/			1.01	J/		

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0599-2.5-a 15-May-12			30BH0600-2.5 15-May-12			30BH0601-2.5 18-May-12			30BH0602-3.0 18-May-12			Sample ID Date Collected SDG Number																	
						A202716		B(a)P TEQ ^A	A202716		B(a)P TEQ ^A	A202782		B(a)P TEQ ^A	A202782		B(a)P TEQ ^A																		
						Concentration			Concentration			Concentration			Concentration																				
PAHs by Method 8270D SIM (mg/kg)																		PAHs by Method 8270D SI																	
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	1-Methylnaphthalene															
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	2-Methylnaphthalene															
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	Acenaphthene															
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	Acenaphthylene															
Anthracene	120-12-7	17000	170000	21000	300000	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	Anthracene															
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.047	/			0.033	J/		<	0.035	U/		0.032	J/	Benzo(g,h,i)perylene															
Fluoranthene	206-44-0	2300	22000	3200	59000		0.055	/			0.039	/		<	0.035	U/		0.058	/	Fluoranthene															
Fluorene	86-73-7	2300	22000	2600	33000	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	Fluorene															
Naphthalene	91-20-3	3.6	18	55	300	<	0.035	U/		<	0.035	U/		<	0.035	U/	<	0.037	U/	Naphthalene															
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.035	J/		<	0.035	J/		<	0.035	J/	<	0.037	J/	Phenanthrene															
Pyrene	129-00-0	1700	17000	2400	45000		0.051	/			0.037	/		<	0.035	U/		0.051	/	Pyrene															
Carcinogenic PAHs ^A (mg/kg)																		Carcinogenic PAHs ^A (mg/																	
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.046	/	0.0046		0.034	J/	0.0034		0.012	J/	0.0012		0.042	/	0.0042	Benzo(a)anthracene													
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.053	/	0.053		0.035	/	0.035	<	0.035	U/	0.0175		0.044	/	0.044	Benzo(a)pyrene													
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.078	/	0.0078		0.053	/	0.0053	<	0.035	U/	0.00175		0.072	/	0.0072	Benzo(b)fluoranthene													
Benzo(k)fluoranthene	207-08-9	1.5	2.1	(#)	(#)		0.029	J/	0.00029		0.02	J/	0.0002	<	0.035	U/	0.000175		0.022	J/	0.00022	Benzo(k)fluoranthene													
Chrysene	218-01-9	15	210	(#)	(#)		0.045	/	0.000045		0.032	J/	0.000032	<	0.035	U/	0.0000175		0.042	/	0.000042	Chrysene													
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.035	U/	0.0175	<	0.035	U/	0.0175	<	0.035	U/	0.0175	<	0.037	U/	0.0185	Dibenzo(a,h)anthracene													
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.040	/	0.004		0.025	J/	0.0025	<	0.035	U/	0.00175		0.028	J/	0.0028	Indeno(1,2,3-cd)pyrene													
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																		Total Benzo(a)pyrene Equi																	
B(a)P Equivalent		NA	NA	0.1	0.7				0.087235				0.063932				0.0398925				0.076962	B(a)P Equivalent													
Select Metals by Method 6010C (mg/kg)																		Select Metals by Method 60																	
Antimony	7440-36-0	31	410	27	370		0.525	J/B		<	2.86	U/			0.479	J/B			0.728	J/B		Antimony													
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.42	J/		<	2.86	U/		<	3.87	U/			0.853	J/		Arsenic													
Copper	7440-50-8	3100	41000	150	89000		0.603	J/B			0.286	J/B		<	0.969	U/			2.48	/		Copper													
Iron	7439-89-6	55000	720000	53000	NR		329	/			323	/			44.8	/			487	/		Iron													
Lead	7439-92-1	400	800	400	1400		289	/			94	/			66.1	/			298	/		Lead													
Tin	7440-31-5	47000	610000	47000	880000		1.01	J/B			0.803	J/B			0.972	J/B			0.987	J/B		Tin													
Zinc	7440-66-6	23000	310000	26000	630000		0.496	J/			0.547	J/			0.511	J/			10.4	/		Zinc													

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0602-3.0-a 18-May-12		30BH0603-1.0 17-May-12		30BH0604-0.5 14-May-12		30BH0605-1.0 18-May-12		Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)								
					A202782	B(a)P	A202782	B(a)P	A202716	B(a)P	A202782	B(a)P											
					Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A	Concentration	TEQ ^A											
M (mg/kg)													PAHs by Method 8270D SIM (mg/kg)										
90-12-0	16	53	200	1800	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	1-Methylnaphthalene	90-12-0	16				
91-57-6	230	2200	210	2100	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	2-Methylnaphthalene	91-57-6	230				
83-32-9	3400	33000	2400	20000	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	Acenaphthene	83-32-9	3400				
208-96-8	NR	NR	1800	20000	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	Acenaphthylene	208-96-8	NR				
120-12-7	17000	170000	21000	300000	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	Anthracene	120-12-7	17000				
191-24-2	NR	NR	2500	52000		0.025	J/		0.040	/	<	0.035	U/		0.036	/	Benzo(g,h,i)perylene	191-24-2	NR				
206-44-0	2300	22000	3200	59000		0.044	/		0.080	/	<	0.035	U/		0.083	/	Fluoranthene	206-44-0	2300				
86-73-7	2300	22000	2600	33000	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	Fluorene	86-73-7	2300				
91-20-3	3.6	18	55	300	<	0.037	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/	Naphthalene	91-20-3	3.6				
85-01-8	NR	NR	2200	36000	<	0.037	U/		0.035	/	<	0.035	U/		0.039	/	Phenanthrene	85-01-8	NR				
129-00-0	1700	17000	2400	45000		0.039	/		0.068	/	<	0.035	U/		0.070	/	Pyrene	129-00-0	1700				
kg)													Carcinogenic PAHs ^A (mg/kg)										
56-55-3	0.15	2.1	(#)	(#)		0.036	J/	0.0036		0.050	/	0.005	<	0.035	U/	0.00175		0.048	/	0.0048	Benzo(a)anthracene	56-55-3	0.15
50-32-8	0.015	0.21	0.1	0.7		0.035	J/	0.035		0.050	/	0.05	<	0.035	U/	0.0175		0.049	/	0.049	Benzo(a)pyrene	50-32-8	0.015
205-99-2	0.15	2.1	(#)	(#)		0.056	/	0.0056		0.078	/	0.0078	<	0.035	U/	0.00175		0.076	/	0.0076	Benzo(b)fluoranthene	205-99-2	0.15
207-08-9	1.5	21	(#)	(#)		0.017	J/	0.00017		0.025	J/	0.00025	<	0.035	U/	0.000175		0.024	J/	0.00024	Benzo(k)fluoranthene	207-08-9	1.5
218-01-9	15	210	(#)	(#)		0.03	J/	0.00003		0.053	/	0.000053	<	0.035	U/	0.0000175		0.049	J/	0.000049	Chrysene	218-01-9	15
53-70-3	0.015	0.21	(#)	(#)	<	0.037	U/	0.0185	<	0.035	U/	0.0175	<	0.035	U/	0.0175	<	0.036	U/	0.018	Dibenzo(a,h)anthracene	53-70-3	0.015
193-39-5	0.15	2.10	(#)	(#)		0.022	J/	0.0022		0.035	/	0.0035	<	0.035	U/	0.00175		0.030	J/	0.003	Indeno(1,2,3-cd)pyrene	193-39-5	0.15
ivalent Concentration ^A (mg/kg)													Total Benzo(a)pyrene Equivalent Concentration ^A (n										
	NA	NA	0.1	0.7				0.0651				0.084103				0.0404425				0.082689	B(a)P Equivalent		NA
010C (mg/kg)													Select Metals by Method 6010C (mg/kg)										
7440-36-0	31	410	27	370		0.842	J/B			1.08	J/B		<	2.83	U/			1.09	J/B		Antimony	7440-36-0	31
7440-38-2	0.39	1.6	2.1	12		1.25	J/			0.614	J/		<	2.83	U/			4.02	/		Arsenic	7440-38-2	0.39
7440-50-8	3100	41000	150	89000		2.55	/			1.3	/		<	0.706	U/			1.39	/		Copper	7440-50-8	3100
7439-89-6	55000	720000	53000	NR		506	/			251	/			17.2	/B/			3680	/		Iron	7439-89-6	55000
7439-92-1	400	800	400	1400		326	/			279	/			10.6	/			128	/		Lead	7439-92-1	400
7440-31-5	47000	610000	47000	880000		1.26	J/B			1.29	J/B			0.732	J/B			0.964	J/B		Tin	7440-31-5	47000
7440-66-6	23000	310000	26000	630000		11	/			10.9	/		<	1.41	U/			5.7	/		Zinc	7440-66-6	23000

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0606-3.5 18-May-12		30BH0607-2.5 18-May-12		30BH0609-1.5 14-May-12		30BH0610-0.5 14-May-12		Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL									
			A202782	B(a)P TEQ ^A	A202782	B(a)P TEQ ^A	A202738	B(a)P TEQ ^A	A202716	B(a)P TEQ ^A														
			Concentration		Concentration		Concentration		Concentration															
PAHs by Method 8270D SIM (mg/kg)																								
53	200	1800	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	1-Methylnaphthalene	90-12-0	16	53	200					
2200	210	2100	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	2-Methylnaphthalene	91-57-6	230	2200	210					
33000	2400	20000	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	Acenaphthene	83-32-9	3400	33000	2400					
NR	1800	20000	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	Acenaphthylene	208-96-8	NR	NR	1800					
170000	21000	300000	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	Anthracene	120-12-7	17000	170000	21000					
NR	2500	52000		0.087	/		0.042	/		0.034	U/	<	0.035	U/	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500					
22000	3200	59000		0.14	/		0.061	/		0.014	J/	<	0.016	J/	Fluoranthene	206-44-0	2300	22000	3200					
22000	2600	33000	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	Fluorene	86-73-7	2300	22000	2600					
18	55	300	<	0.034	U/	<	0.037	U/	<	0.034	U/	<	0.035	U/	Naphthalene	91-20-3	3.6	18	55					
NR	2200	36000		0.054	/	<	0.037	J/	<	0.034	U/	<	0.035	U/	Phenanthrene	85-01-8	NR	NR	2200					
17000	2400	45000		0.13	/		0.056	/		0.014	J/	<	0.015	J/	Pyrene	129-00-0	1700	17000	2400					
Carcinogenic PAHs ^A (mg/kg)																								
2.1	(#)	(#)		0.10	/	0.01		0.045	/	0.0045		0.017	J/	0.0017		0.019	J/	0.0019	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	
0.21	0.1	0.7		0.13	/	0.13		0.055	/	0.055		0.0098	J/	0.0098		0.015	J/	0.015	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	
2.1	(#)	(#)		0.19	/	0.019		0.08	/	0.008		0.022	J/	0.0022		0.026	Q-DC	0.0026	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	
21	(#)	(#)		0.064	/	0.00064		0.024	J/	0.00024	<	0.034	U/	0.00017	<	0.035	U/	0.000175	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	
210	(#)	(#)		0.12	/	0.00012		0.043	/	0.000043	<	0.034	U/	0.000017	<	0.035	U/	0.0000175	Chrysene	218-01-9	15	210	(#)	
0.21	(#)	(#)		0.022	J/	0.022	<	0.037	U/	0.0185	<	0.034	U/	0.017	<	0.035	U/	0.0175	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	
2.10	(#)	(#)		0.081	/	0.0081		0.035	J/	0.0035	<	0.034	U/	0.0017	<	0.035	U/	0.00175	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	
ng/kg																								
NA	0.1	0.7				0.18986				0.089783					0.032587				0.0389425	Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)				
											B(a)P Equivalent					NA	NA	0.1						
Select Metals by Method 6010C (mg/kg)																								
410	27	370		0.36	J/B			0.566	J/B		<	2.95	U/		<	2.51	U/		Antimony	7440-36-0	31	410	27	
1.6	2.1	12		0.473	J/			0.681	J/		<	0.43	J/			0.712	J/		Arsenic	7440-38-2	0.39	1.6	2.1	
41000	150	89000		0.177	J/			1.21	/		<	0.738	U/			0.444	J/B		Copper	7440-50-8	3100	41000	150	
720000	53000	NR		51.4	/			215	/			13.4	J/B			616	/		Iron	7439-89-6	55000	720000	53000	
800	400	1400		61.2	/			196	/			44.3	/			36.5	/		Lead	7439-92-1	400	800	400	
610000	47000	880000		0.856	J/B			1.07	J/B			0.768	J/B			0.964	J/B		Tin	7440-31-5	47000	610000	47000	
310000	26000	630000		0.456	J/			2.55	/		<	1.48	U/			1.22	J/		Zinc	7440-66-6	23000	310000	26000	

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

62-777 Industrial Criteria SCTL	30BH0616-0.5 14-May-12			30BH0608-1.5 17-May-12			30BH0611-2.5 15-May-12			30BH0612-2.5 18-May-12			Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH 18- A202782 Concentrat					
	A202716		B(a)P	A202758		B(a)P	A202738		B(a)P	A202782		B(a)P												
	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A	Concentration		TEQ ^A												
PAHs by Method 8270D SIM (mg/kg)																								
1800	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.035				
2100	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.035				
20000	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.035				
20000	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.035				
300000	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Anthracene	120-12-7	17000	170000	21000	300000	<	0.035				
52000		0.025	J/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000		0.056				
59000		0.042	/	<	0.036	U/		0.024	J/	<	0.037	U/	Fluoranthene	206-44-0	2300	22000	3200	59000		0.096				
33000	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Fluorene	86-73-7	2300	22000	2600	33000	<	0.035				
300	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Naphthalene	91-20-3	3.6	18	55	300	<	0.035				
36000	<	0.033	U/	<	0.036	U/	<	0.037	U/	<	0.037	U/	Phenanthrene	85-01-8	NR	NR	2200	36000		0.035				
45000		0.039	/	<	0.036	U/		0.021	J/	<	0.037	U/	Pyrene	129-00-0	1700	17000	2400	45000		0.090				
Carcinogenic PAHs ^A (mg/kg)																								
(#)		0.034	/	0.0034	<	0.036	U/	0.0018		0.022	J/	0.0022	<	0.037	U/	0.00185	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.071
0.7		0.037	/	0.037	<	0.036	U/	0.018		0.018	J/	0.018	<	0.037	U/	0.0185	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.084
(#)		0.062	/	0.0062	<	0.036	U/	0.0018		0.027	J/	0.0027	<	0.037	U/	0.00185	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.13
(#)		0.019	J/	0.00019	<	0.036	U/	0.00018	<	0.037	U/	0.000185	<	0.037	U/	0.000185	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)		0.041
(#)		0.032	J/	0.000032	<	0.036	U/	0.000018		0.015	J/	0.000015	<	0.037	U/	0.0000185	Chrysene	218-01-9	15	210	(#)	(#)		0.074
(#)	<	0.033	U/	0.0165	<	0.036	U/	0.018	<	0.037	U/	0.0185	<	0.037	U/	0.0185	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.035
(#)		0.022	J/	0.0022	<	0.036	U/	0.0018	<	0.037	U/	0.00185	<	0.037	U/	0.00185	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)		0.050
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																								
0.7				0.065522				0.041598				0.04345				0.0427535	B(a)P Equivalent		NA	NA	0.1	0.7		
Select Metals by Method 6010C (mg/kg)																								
370	<	2.73	U/	<	3.9	U/	<	3.12	U/		0.458	J/B	Antimony	7440-36-0	31	410	27	370		0.606				
12	<	2.73	U/	<	3.9	U/		0.601	J/		0.724	J/	Arsenic	7440-38-2	0.39	1.6	2.1	12		0.636				
89000		0.741	/B/		0.326	J/B		0.269	J/		0.256	J/	Copper	7440-50-8	3100	41000	150	89000		0.409				
NR		248	/		71.1	/		195	/		187	/	Iron	7439-89-6	55000	720000	53000	NR		408				
1400		79.3	/		47.2	/		66.3	/		98.7	/	Lead	7439-92-1	400	800	400	1400		76.4				
880000		0.794	J/B		1.07	J/B		0.838	J/B		0.765	J/B	Tin	7440-31-5	47000	610000	47000	880000		0.87				
630000		1.79	/		1.13	J/		1.21	J/		0.98	J/	Zinc	7440-66-6	23000	310000	26000	630000		1.83				

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Location	30BH0614-2.0 17-May-12		30BH0615-1.5 17-May-12		30BH0615-1.5-a 17-May-12		Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0617-1.5 14-May-12											
	B(a)P TEQ ^A	A202782 Concentration	B(a)P TEQ ^A	A202782 Concentration	B(a)P TEQ ^A	A202782 Concentration							B(a)P TEQ ^A	A202716 Concentration		B(a)P TEQ ^A								
PAHs by Method 8270D SIM (mg/kg)																								
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	90-12-0	16	53	200	1800	<	0.037	U/	<						
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	1-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.037	U/	<					
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	2-Methylnaphthalene	83-32-9	3400	33000	2400	20000	<	0.037	U/	<					
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Acenaphthene	208-96-8	NR	NR	1800	20000	<	0.037	U/	<					
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Acenaphthylene	120-12-7	17000	170000	21000	300000	<	0.037	U/	<					
/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Anthracene	191-24-2	NR	NR	2500	52000	<	0.037	U/	<					
/	<	0.036	J/	<	0.04	U/	<	0.039	U/	Benzo(g,h,i)perylene	206-44-0	2300	22000	3200	59000	<	0.037	U/	<					
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Fluoranthene	86-73-7	2300	22000	2600	33000	<	0.037	U/	<					
U/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Fluorene	91-20-3	3.6	18	55	300	<	0.037	U/	<					
/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Naphthalene	85-01-8	NR	NR	2200	36000	<	0.037	U/	<					
/	<	0.036	U/	<	0.04	U/	<	0.039	U/	Phenanthrene	129-00-0	1700	17000	2400	45000	<	0.037	U/	<					
Carcinogenic PAHs ^A (mg/kg)																								
/	0.0071	0.015	J/	0.0015	0.016	J/	0.0016	0.016	J/	0.0016	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.037	U/	0.00185	<			
/	0.084	0.10	J/	0.01	<	0.04	U/	0.02	0.0091	J/	0.0091	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.037	U/	0.0185	<		
/	0.013	0.015	J/	0.0015	<	0.04	U/	0.002	<	0.039	U/	0.00195	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.037	U/	0.00185	<	
/	0.00041	<	0.036	U/	0.00018	<	0.04	U/	0.0002	<	0.039	U/	0.000195	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.037	U/	0.000185	<
/	0.000074	<	0.036	U/	0.000018	<	0.04	U/	0.00002	<	0.039	U/	0.0000195	Chrysene	218-01-9	15	210	(#)	(#)	<	0.037	U/	0.0000185	<
U/	0.0175	<	0.036	U/	0.018	<	0.04	U/	0.02	<	0.039	U/	0.0195	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.037	U/	0.0185	<
/	0.005	<	0.036	U/	0.0018	<	0.04	U/	0.002	<	0.039	U/	0.00195	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.037	U/	0.00185	<
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																								
	0.127084			0.032998			0.04582			0.0343145	B(a)P Equivalent		NA	NA	0.1	0.7					0.0427535			
Select Metals by Method 6010C (mg/kg)																								
J/B		0.27	J/B		0.682	J/B		<	3.91	U/	Antimony	7440-36-0	31	410	27	370	<	3.14	U/					
J/		<	2.15	U/		1.01	J/		1.08	J/	Arsenic	7440-38-2	0.39	1.6	2.1	12		0.482	J/					
J/			0.168	J/		1.69	/		1.77	/	Copper	7440-50-8	3100	41000	150	89000		0.301	J/B					
/			39.5	/		680	/		739	/	Iron	7439-89-6	55000	720000	53000	NR		491	/					
/			70.2	/		117	/		111	/	Lead	7439-92-1	400	800	400	1400		10.2	/					
J/B			0.592	J/B		1.28	J/B		1.58	J/	Tin	7440-31-5	47000	610000	47000	880000		0.981	J/B					
/			0.665	J/		8.28	/		8.98	/	Zinc	7440-66-6	23000	310000	26000	630000		1.03	J/					

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

30BH0618-3.5 18-May-12		30BH0619-3.5 18-May-12		30BH0620-2.5 15-May-12		Sample ID Date Collected	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria	62-777 Industrial Criteria	30BH0620-2.5-a 15-May-12		30BH0621-2 18-May-12										
A202782 Concentration	B(a)P TEQ ^A	A202782 Concentration	B(a)P TEQ ^A	A202738 Concentration	B(a)P TEQ ^A	SDG Number				SCTL	SCTL	A202738 Concentration	B(a)P TEQ ^A	A202782 Concentration										
PAHs by Method 8270D SIM (mg/kg)																								
0.035	U/	<	0.035	U/	<	0.037	U/	90-12-0	16	53	200	1800	<	0.037	U/	<	0.037	U/						
0.035	U/	<	0.035	U/	<	0.037	U/	1-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.037	U/	<	0.037	U/					
0.035	U/	<	0.035	U/	<	0.037	U/	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.037	U/		0.047	/					
0.035	U/	<	0.035	U/	<	0.037	U/	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.037	U/	<	0.037	U/					
0.035	U/	<	0.035	U/	<	0.037	U/	Anthracene	120-12-7	17000	170000	21000	300000	<	0.037	U/		0.35	/					
0.035	U/		0.024	J/	<	0.037	U/	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.037	U/		0.72	/					
0.035	U/		0.029	J/	<	0.037	U/	Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.037	U/		2.7	/					
0.035	U/	<	0.035	U/	<	0.037	U/	Fluorene	86-73-7	2300	22000	2600	33000	<	0.037	U/		0.051	/					
0.035	U/	<	0.035	U/	<	0.037	U/	Naphthalene	91-20-3	3.6	18	55	300	<	0.037	U/	<	0.037	U/					
0.035	U/	<	0.035	U/	<	0.037	U/	Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.037	U/		1.5	/					
0.035	U/		0.029	J/	<	0.037	U/	Pyrene	129-00-0	1700	17000	2400	45000	<	0.037	U/		2.2	/					
Carcinogenic PAHs ^A (mg/kg)																								
0.035	U/	0.00175		0.027	J/	0.0027	<	0.037	U/	0.00185	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.015	J/	0.0015		1.3	/	
0.035	U/	0.0175		0.030	J/	0.03	<	0.037	U/	0.0185	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.0087	J/	0.0087		1.4	/	
0.035	U/	0.00175		0.042	/	0.0042	<	0.037	U/	0.00185	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.037	U/	0.00185		1.9	/	
0.035	U/	0.000175	<	0.035	/	0.000175	<	0.037	U/	0.000185	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.037	U/	0.000185		0.66	/	
0.035	U/	0.0000175		0.022	J/	0.000022	<	0.037	U/	0.0000185	Chrysene	218-01-9	15	210	(#)	(#)	<	0.037	U/	0.0000185		1.4	/	
0.035	U/	0.0175	<	0.035	U/	0.0175	<	0.037	U/	0.0185	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.037	U/	0.0185		0.18	/	
0.035	U/	0.00175		0.017	J/	0.0017	<	0.037	U/	0.00185	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.037	U/	0.00185		0.7	/	
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																								
		0.0404425				0.056297				0.0427535	B(a)P Equivalent		NA	NA	0.1	0.7					0.0326035			
Select Metals by Method 6010C (mg/kg)																								
0.315	J/B			0.846	J/B		<	2.62	U/		Antimony	7440-36-0	31	410	27	370		0.229	J/B			<	4.19	U/
0.68	J/		<	3.25	U/			0.647	J/		Arsenic	7440-38-2	0.39	1.6	2.1	12		0.429	J/			<	4.19	U/
0.214	J/			0.289	J/			0.372	J/		Copper	7440-50-8	3100	41000	150	89000		0.333	J/				0.26	J/
164	/			120	/			396	/		Iron	7439-89-6	55000	720000	53000	NR		351	/				220	/
125	/			214	/			33.6	/		Lead	7439-92-1	400	800	400	1400		26.8	/				25.6	/
0.86	J/B			1.0	J/B			0.729	J/B		Tin	7440-31-5	47000	610000	47000	880000		0.66	J/B				1.08	J/B
0.724	J/			0.653	J/			1.17	J/		Zinc	7440-66-6	23000	310000	26000	630000		1.13	/				1.11	J/

Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID SDG Number	30BH0622-2.0 17-May-12			30BH0623-2.5 14-May-12			Date Collected	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0624-1.5 15-May-12		30BH0625-3.0 14-May-12		30BH 14- A202692							
	B(a)P TEQ ^A	A202782		B(a)P TEQ ^A	A202692								A202716		A202692			B(a)P TEQ ^A						
	Concentration	U/	U/	Concentration	U/	U/							Concentration	U/	Concentration	U/		Concentration	U/					
PAHs by Method 8270D SIM (mg/kg)																								
	<	0.035	U/		<	0.035	U/		16	53	200	1800	<	0.036	U/		<	0.034	U/		<	0.034		
	<	0.035	U/		<	0.035	U/		91-57-6	230	2200	210	2100	<	0.036	U/		<	0.034	U/		<	0.034	
	<	0.035	U/		<	0.035	U/		83-32-9	3400	33000	2400	20000	<	0.036	U/		<	0.034	U/		<	0.034	
	<	0.035	U/		<	0.035	U/		208-96-8	NR	NR	1800	20000	<	0.036	U/		<	0.034	U/		<	0.034	
	<	0.035	U/		<	0.035	U/		120-12-7	17000	170000	21000	300000	<	0.036	U/		<	0.034	U/		<	0.034	
		0.026	J/		<	0.035	U/		191-24-2	NR	NR	2500	52000	<	0.036	U/		<	J/B	U/			0.027	
		0.044	/		<	0.035	U/		206-44-0	2300	22000	3200	59000	<	0.036	U/		<	0.034	U/			0.031	
	<	0.035	U/		<	0.035	U/		86-73-7	2300	22000	2600	33000	<	0.036	U/		<	0.034	U/		<	0.034	
	<	0.035	U/		<	0.035	U/		91-20-3	3.6	18	55	300	<	0.036	U/		<	0.034	U/		<	0.034	
	<	0.035	U/		<	0.035	U/		85-01-8	NR	NR	2200	36000	<	0.036	U/		<	0.034	U/		<	0.034	
		0.039	/		<	0.035	U/		129-00-0	1700	17000	2400	45000	<	0.036	U/		<	0.034	U/			0.029	
Carcinogenic PAHs^A (mg/kg)																								
0.13		0.033	J/	0.0033	<	0.035	U/	0.00175	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.014	J/	0.0014	<	0.034	U/	0.0017		0.028
1.4		0.029	J/	0.029	<	0.035	U/	0.0175	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.036	U/	0.018	<	0.034	U/	0.017		0.028
0.19		0.050	/	0.005	<	0.035	U/	0.00175	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.015	J/	0.0015	<	0.034	U/	0.0017		0.046
0.0066		0.016	J/	0.00016	<	0.035	U/	0.000175	Benzo(k)fluoranthene	207-08-9	1.5	21	Benzo(#)	(#)	<	0.036	U/	0.00018	<	0.034	U/	0.00017	<	0.034
0.0014		0.029	J/	0.000029	<	0.035	U/	0.0000175	Chrysene	218-01-9	15	210	(#)	(#)	<	0.036	U/	0.000018	<	0.034	U/	0.000017		0.026
0.18	<	0.035	U/	0.0175	<	0.035	U/	0.0175	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.036	U/	0.018	<	0.034	U/	0.017	<	0.034
0.07		0.020	J/	0.002	<	0.035	U/	0.00175	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017		0.023
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																								
1.978				0.056989				0.0404425	B(a)P Equivalent		NA	NA	0.1	0.7				0.040898						0.039287
Select Metals by Method 6010C (mg/kg)																								
	<	3.1	U/		<	3.02	U/		Antimony	7440-36-0	31	410	27	370		0.296	J/B		<	2.96	U/			0.534
	<	3.1	U/		<	3.02	U/		Arsenic	7440-38-2	0.39	1.6	2.1	12		0.373	J/		<	2.96	U/			0.493
		0.124	J/			0.174	J/		Copper	7440-50-8	3100	41000	150	89000		0.194	J/B		<	0.74	U/			0.342
		22.6	/			556	/		Iron	7439-89-6	55000	720000	53000	NR		218	/			21.1	/			185
		63.6	/			20.1	/		Lead	7439-92-1	400	800	400	1400		65	/			23.2	/			153
		0.779	J/B			0.822	J/B		Tin	7440-31-5	47000	610000	47000	880000		0.88	J/B			0.759	J/B			0.896
	<	1.55	U/			1.25	J/		Zinc	7440-66-6	23000	310000	26000	630000		0.869	J/		<	1.48	U/			0.743

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

10626-2.0 May-12	30BH0626-2.0-a 14-May-12				Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0627-2.5 15-May-12		30BH0628-1.5 15-May-12		30BH0629-2.0 14-May-12									
	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A	Concentration							A202716	B(a)P TEQ ^A	A202738	B(a)P TEQ ^A	A202695	B(a)P TEQ ^A								
		Concentration																Concentration	Concentration	Concentration				
PAHs by Method 8270D SIM (mg/kg)																								
U/	<	0.035	U/		1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		Anthracene	120-12-7	17000	170000	21000	300000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
J/		0.032	J/		Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
J/		0.035	/		Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		Fluorene	86-73-7	2300	22000	2600	33000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		Naphthalene	91-20-3	3.6	18	55	300	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
U/	<	0.035	U/		Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
J/		0.031	J/		Pyrene	129-00-0	1700	17000	2400	45000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<				
Carcinogenic PAHs^A (mg/kg)																								
J/	0.0028	0.032	J/	0.0032	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	
J/	0.028	0.036	/	0.036	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.036	U/	0.018	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	
/	0.0046	0.055	/	0.0055	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	
J/	0.00017	0.015	J/	0.00015	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.036	U/	0.00018	<	0.034	U/	0.00017	<	0.035	U/	0.000175	<	
J/	0.000026	0.030	J/	0.00003	Chrysene	218-01-9	15	210	(#)	(#)	<	0.036	U/	0.000018	<	0.034	U/	0.000017	<	0.035	U/	0.0000175	<	
U/	0.017	<	0.035	U/	0.0175	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.036	U/	0.018	<	0.034	U/	0.017	<	0.035	U/	0.0175	<
J/	0.0023	0.024	J/	0.0024	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	
Total Benzo(a)pyrene Equivalent Concentration^A (mg/kg)																								
	0.054896			0.06478	B(a)P Equivalent		NA	NA	0.1	0.7			0.041598			0.039287					0.0404425			
Select Metals by Method 6010C (mg/kg)																								
J/		0.469	J/		Antimony	7440-36-0	31	410	27	370	<	3.17	U/	<	2.68	U/		0.238	J/		<			
J/		0.406	J/		Arsenic	7440-38-2	0.39	1.6	2.1	12		0.418	J/	<	2.68	U/		<	2.37	U/	<			
J/		0.391	J/		Copper	7440-50-8	3100	41000	150	89000		0.181	J/B	<	0.67	U/			0.184	J/	<			
/		204	/		Iron	7439-89-6	55000	720000	53000	NR		522	/		14.1	/B/			519	/	<			
/		146	/		Lead	7439-92-1	400	800	400	1400		4.05	/		46.8	/			9.08	/	<			
J/B		0.888	J/B		Tin	7440-31-5	47000	610000	47000	880000		0.848	J/B		0.695	J/B			0.703	J/B	<			
J/		0.979	J/		Zinc	7440-66-6	23000	310000	26000	630000		0.85	J/	<	1.34	U/			0.878	J/	<			

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

30BH0630-2.0 15-May-12		Sample ID	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0631-3.0 18-May-12		30BH0632-2.0 14-May-12		30BH0633-0.5 14-May-12		30BH0633-0. 14-May-12									
A202716 Concentration	B(a)P TEQ ^A	Date Collected SDG Number						A202782 Concentration	B(a)P TEQ ^A	A202695 Concentration	B(a)P TEQ ^A	A202695 Concentration	B(a)P TEQ ^A	A202695 Concentration	B(a)P TEQ ^A								
PAHs by Method 8270D SIM (mg/kg)																							
0.034	U/		1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
0.034	U/		Pyrene	129-00-0	1700	17000	2400	45000	<	0.034	U/	<	0.035	U/	<	0.035	U/	<	0.036	U/			
Carcinogenic PAHs ^A (mg/kg)																							
0.034	U/	0.0017	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.035	U/	0.00175	<	0.036	U/
0.034	U/	0.017	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.035	U/	0.0175	<	0.036	U/
0.034	U/	0.0017	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.035	U/	0.00175	<	0.036	U/
0.034	U/	0.00017	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.034	U/	0.00017	<	0.035	U/	0.000175	<	0.035	U/	0.000175	<	0.036	U/
0.034	U/	0.000017	Chrysene	218-01-9	15	210	(#)	(#)	<	0.034	U/	0.000017	<	0.035	U/	0.0000175	<	0.035	U/	0.0000175	<	0.036	U/
0.034	U/	0.017	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.035	U/	0.0175	<	0.036	U/
0.034	U/	0.0017	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.035	U/	0.00175	<	0.036	U/
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																							
		0.039287	B(a)P Equivalent		NA	NA	0.1	0.7				0.039287				0.0404425				0.0404425			
Select Metals by Method 6010C (mg/kg)																							
2.7	U/		Antimony	7440-36-0	31	410	27	370	<	3.08	U/	<	2.81	U/	<	3.02	U/	<	3.11	U/			
2.7	U/		Arsenic	7440-38-2	0.39	1.6	2.1	12	<	3.08	U/	<	2.81	U/	<	3.02	U/	<	3.11	U/			
0.676	U/B/		Copper	7440-50-8	3100	41000	150	89000	<	0.769	U/		0.168	J/		0.122	J/		0.195	J/			
23.9	/B/		Iron	7439-89-6	55000	720000	53000	NR		49.2	/		99.4	/		57.6	/J/		97.9	/			
21.1	/		Lead	7439-92-1	400	800	400	1400		34.3	/		58.9	/		64.7	/		96.6	/			
0.714	J/B		Tin	7440-31-5	47000	610000	47000	880000		0.802	J/B		0.721	J/B		0.792	J/B		0.842	J/B			
1.35	U/		Zinc	7440-66-6	23000	310000	26000	630000		0.30	J/		0.517	J/		0.385	J/		0.517	J/			

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

5-a B(a)P TEQ ^A	Sample ID	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777 Residential Criteria SCTL	62-777 Industrial Criteria SCTL	30BH0634-3.0 15-May-12		30BH0634-3.0-a 15-May-12		30BH0635-1.0 14-May-12		30BH0636-0.5 14-May-12									
	Date Collected						A202716	B(a)P TEQ ^A	A202716	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A	A202695	B(a)P TEQ ^A								
	SDG Number	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration									
PAHs by Method 8270D SIM (mg/kg)																						
	1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Anthracene	120-12-7	17000	170000	21000	300000	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.034	J/	<	0.034	U/	<	0.034	U/							
	Fluorene	86-73-7	2300	22000	2600	33000	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Naphthalene	91-20-3	3.6	18	55	300	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.034	U/	<	0.034	U/	<	0.034	U/							
	Pyrene	129-00-0	1700	17000	2400	45000	<	0.013	J/	<	0.034	U/	<	0.034	U/							
Carcinogenic PAHs ^A (mg/kg)																						
0.0018	Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)		0.018	J/	0.0018		0.015	J/	0.0015		0.010	J/	0.001	<	0.034	U/	0.0017
0.018	Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7		0.012	J/	0.012		0.0095	J/	0.0095	<	0.034	U/	0.017	<	0.034	U/	0.017
0.0018	Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)		0.020	J/	0.002		0.017	J/	0.0017	<	0.034	U/	0.0017	<	0.034	U/	0.0017
0.00018	Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.034	U/	0.00017	<	0.034	U/	0.00017	<	0.034	U/	0.00017	<	0.034	U/	0.00017
0.000018	Chrysene	218-01-9	15	210	(#)	(#)	<	0.034	U/	0.000017	<	0.034	U/	0.000017	<	0.034	U/	0.000017	<	0.034	U/	0.000017
0.018	Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.034	U/	0.017	<	0.034	U/	0.017	<	0.034	U/	0.017	<	0.034	U/	0.017
0.0018	Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.034	U/	0.0017	<	0.034	U/	0.0017	<	0.034	U/	0.0017	<	0.034	U/	0.0017
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																						
0.041598	B(a)P Equivalent		NA	NA	0.1	0.7				0.034687				0.031587				0.038587				0.039287
Select Metals by Method 6010C (mg/kg)																						
	Antimony	7440-36-0	31	410	27	370	<	2.84	U/		<	2.87	U/		<	2.48	U/		<	3.09	U/	
	Arsenic	7440-38-2	0.39	1.6	2.1	12		0.374	J/		<	2.87	U/		<	2.48	U/		<	3.09	U/	
	Copper	7440-50-8	3100	41000	150	89000		0.233	J/B			0.21	J/B		<	0.619	U/			0.128	J/	
	Iron	7439-89-6	55000	720000	53000	NR		319	/			336	/			26.1	/			17.3	/	
	Lead	7439-92-1	400	800	400	1400		87	/			78.9	/			66.6	/			21.7	/	
	Tin	7440-31-5	47000	610000	47000	880000		0.761	J/B			0.757	J/B			0.655	J/B			0.802	J/B	
	Zinc	7440-66-6	23000	310000	26000	630000		0.822	J/			0.813	J/		<	1.24	U/			0.365	J/	

**Table 1-8
Analytical Laboratory Results: Area D
ERP Site FR038
Tyndall AFB, Florida**

Sample ID Date Collected SDG Number	CAS Number	EPA RSLs (Residential)	EPA RSLs (Industrial)	62-777		30BH0637-0.5		30BH0638-0.5		30BH0639-1.0		30BH0640-1.5									
				Residential Criteria	Industrial Criteria	14-May-12		14-May-12		11-May-12		14-May-12									
				SCTL	SCTL	A202692	B(a)P TEQ ^A	A202692	B(a)P TEQ ^A	A202695	B(a)P TEQ ^A	A202695	B(a)P TEQ ^A								
PAHs by Method 8270D SIM (mg/kg)																					
1-Methylnaphthalene	90-12-0	16	53	200	1800	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
2-Methylnaphthalene	91-57-6	230	2200	210	2100	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Acenaphthene	83-32-9	3400	33000	2400	20000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Acenaphthylene	208-96-8	NR	NR	1800	20000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Anthracene	120-12-7	17000	170000	21000	300000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Benzo(g,h,i)perylene	191-24-2	NR	NR	2500	52000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Fluoranthene	206-44-0	2300	22000	3200	59000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Fluorene	86-73-7	2300	22000	2600	33000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Naphthalene	91-20-3	3.6	18	55	300	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Phenanthrene	85-01-8	NR	NR	2200	36000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Pyrene	129-00-0	1700	17000	2400	45000	<	0.036	U/	<	0.034	U/	<	0.035	U/	<	0.036	U/				
Carcinogenic PAHs ^A (mg/kg)																					
Benzo(a)anthracene	56-55-3	0.15	2.1	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.036	U/	0.0018
Benzo(a)pyrene	50-32-8	0.015	0.21	0.1	0.7	<	0.036	U/	0.018	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.036	U/	0.018
Benzo(b)fluoranthene	205-99-2	0.15	2.1	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.036	U/	0.0018
Benzo(k)fluoranthene	207-08-9	1.5	21	(#)	(#)	<	0.036	U/	0.00018	<	0.034	U/	0.00017	<	0.035	U/	0.000175	<	0.036	U/	0.00018
Chrysene	218-01-9	15	210	(#)	(#)	<	0.036	U/	0.000018	<	0.034	U/	0.000017	<	0.035	U/	0.0000175	<	0.036	U/	0.000018
Dibenzo(a,h)anthracene	53-70-3	0.015	0.21	(#)	(#)	<	0.036	U/	0.018	<	0.034	U/	0.017	<	0.035	U/	0.0175	<	0.036	U/	0.018
Indeno(1,2,3-cd)pyrene	193-39-5	0.15	2.10	(#)	(#)	<	0.036	U/	0.0018	<	0.034	U/	0.0017	<	0.035	U/	0.00175	<	0.036	U/	0.0018
Total Benzo(a)pyrene Equivalent Concentration ^A (mg/kg)																					
B(a)P Equivalent		NA	NA	0.1	0.7				0.041598				0.039287				0.0404425				0.041598
Select Metals by Method 6010C (mg/kg)																					
Antimony	7440-36-0	31	410	27	370	<	3.44	U/		<	3.02	U/		<	3.06	U/		<	2.91	U/	
Arsenic	7440-38-2	0.39	1.6	2.1	12		0.471	J/		<	3.02	U/		<	3.06	U/		<	2.91	U/	
Copper	7440-50-8	3100	41000	150	89000		0.18	J/		<	7.55	U/			0.483	J/			0.281	J/	
Iron	7439-89-6	55000	720000	53000	NR		458	/			45.5	/			551	/			282	/	
Lead	7439-92-1	400	800	400	1400		4.59	/			32.6	/			2.91	J/			10.5	/	
Tin	7440-31-5	47000	610000	47000	880000		0.922	J/B			0.826	J/B			0.815	J/B			0.768	J/B	
Zinc	7440-66-6	23000	310000	26000	630000		0.798	J/			0.36	J/			1.21	J/			1.22	J/	

Notes:

A "<" symbol indicates that the particular constituent was not detected.

Bold - indicates a detection

- Site concentrations for carcinogenic PAHs must be converted to benzo(a)pyrene equivalents before comparison with the appropriate direct exposure SCTLs for benzo(a)pyrene using the approach described in the February 2005 'Final Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C.'

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]-anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

mg/kg - milligrams per kilogram

PAH - Polynuclear Aromatic Hydrocarbons

ND - indicates a non-detection

RSL - Regional Screening Level

NR - Not Regulated under Chapter 62-777, F.A.C.

SCTL - Soil Cleanup Target Level

**Table 1-9
Summary of Added Data Qualifiers
ERP Site FR038
Tyndall Air Force Base, Florida**

<u>Modifier</u>	<u>Description</u>
<	Indicates not detected at the reporting limit indicated.
“/”	Separates the laboratory added data qualifiers from the validation data qualifiers. The laboratory added data qualifiers precede the “/,” and the validation qualifiers follow the “/.”

Laboratory Data Qualifiers

<u>Qualifier</u>	<u>Description</u>
B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	Analyte was not detected and is reported as less than the level of detection (LOD) or as defined by the client. The LOD has been adjusted for any dilution or concentration of the sample.
Q	One or more quality control criteria failed.
Q-DO	The spike recovery was outside acceptance limits for Benzo(b)fluoranthene for the MS. The batch was accepted based on acceptable LCS recovery.
Q-DOD	The spike recovery was outside acceptance limits for Fluoranthene for the MSD. The batch was accepted based on acceptable LCS recovery.
QM-0	The matrix spike (2E21014-MS1) and matrix spike duplicate (2E21014-MSD1) had recoveries that were outside acceptance limits for antimony, but by virtue of a laboratory control sample being in control, the laboratory has demonstrated to be in control of its internal process.
QM-02	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.

Validation Data Qualifiers

<u>Qualifier</u>	<u>Description</u>
B	The analyte was found in an associated blank as well as in the sample.
M	Matrix spike recovery exceeded established criteria.

Table 1-10
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0649-3.0 10-May-12	30BH0651-1.0 15-May-12	30BH0653-3.0 11-May-12	30BH0655-1.5 10-May-12	30BH0656-3.5 10-May-12	30BH0659-2.0 11-May-12
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	2.1		0.30	0.33	3.3	0.34	0.28	0.40
Benzo(a)pyrene	50-32-8	0.21		0.34	0.45	3.9	0.48	0.39	0.45
Benzo(b)fluoranthene	205-99-2	2.1		0.49	0.71	5.5	0.72	0.55	0.67
Benzo(k)fluoranthene	207-08-9	21		0.15	0.22	2.0	0.21	0.18	0.20
Chrysene	218-01-9	210		0.34	0.39	3.5	0.39	0.32	0.44
Dibenzo(a,h)anthracene	53-70-3	0.21		0.048	0.047	0.48	0.049	0.053	0.052
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.20	0.20	1.8	0.21	0.22	0.22
Total Benzo(a)pyrene Equivalent Concentration									
B(a)P Equivalent			0.7	0.48884	0.62359	5.4635	0.65849	0.55012	0.63344
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	410	370	ND	3050	ND	0.629	0.68	0.401
Arsenic	7440-38-2	1.6	12	ND	722	ND	0.496	0.455	ND
Lead	7439-92-1	800	1400	115	22700	6.24	164	360	157

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-10
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0661-3.0 10-May-12	30BH0662-3.5 10-May-12	30BH0662-3.5-a 10-May-12	30BH0666-4.5 10-May-12	30BH0667-2.5 11-May-12	30BH0669-3.5 10-May-12
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	2.1		0.3	0.26	0.45	0.41	2.6	10
Benzo(a)pyrene	50-32-8	0.21		0.36	0.36	0.67	0.43	4.6	13
Benzo(b)fluoranthene	205-99-2	2.1		0.51	0.49	0.93	0.60	6.1	21
Benzo(k)fluoranthene	207-08-9	21		0.17	0.17	0.31	0.21	2	5.4
Chrysene	218-01-9	210		0.33	0.3	0.52	0.45	3.3	11
Dibenzo(a,h)anthracene	53-70-3	0.21		0.049	0.041	0.081	0.061	0.61	1.5
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.21	0.17	0.31	0.25	2.5	5.0
Total Benzo(a)pyrene Equivalent Concentration									
B(a)P Equivalent			0.7	0.51303	0.495	0.92362	0.61955	6.3533	18.165
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	410	370	0.379	0.801	0.577	ND	ND	0.79
Arsenic	7440-38-2	1.6	12	ND	0.597	0.62	ND	ND	0.303
Lead	7439-92-1	800	1400	50.7	277	125	13.8	147	56.2

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-10
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0671-2.0 10-May-12 Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)				
Benzo(a)anthracene	56-55-3	2.1		0.28
Benzo(a)pyrene	50-32-8	0.21		0.39
Benzo(b)fluoranthene	205-99-2	2.1		0.6
Benzo(k)fluoranthene	207-08-9	21		0.19
Chrysene	218-01-9	210		0.33
Dibenzo(a,h)anthracene	53-70-3	0.21		0.041
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.18
Total Benzo(a)pyrene Equivalent Concentration				
B(a)P Equivalent			0.7	0.53923
ITRC Metals by Method 6010B (mg/kg)				
Antimony	7440-36-0	410	370	0.473
Arsenic	7440-38-2	1.6	12	0.494
Lead	7439-92-1	800	1400	133

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-11
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area B
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0680-0.5 14-May-12 Concentration	30BH0681-0.5 5/14/2012 Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)					
Benzo(a)anthracene	56-55-3	2.1		0.024	0.034
Benzo(a)pyrene	50-32-8	0.21		0.019	0.035
Benzo(b)fluoranthene	205-99-2	2.1		0.032	0.046
Benzo(k)fluoranthene	207-08-9	21		ND	0.020
Chrysene	218-01-9	210		0.018	0.030
Dibenzo(a,h)anthracene	53-70-3	0.21		ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.015	0.023
Total Benzo(a)pyrene Equivalent Concentration					
B(a)P Equivalent			0.7	0.043288	0.06253
ITRC Metals by Method 6010B (mg/kg)					
Arsenic	7440-38-2	1.6	12	3.33	6.17
Lead	7439-92-1	800	1400	9.74	18.4

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-12
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0551-2.0 16-May-12	30BH0552-1.0 16-May-12	30BH0553-2.0 16-May-12	30BH0554-1.0 16-May-12	30BH0555-1.5 16-May-12	30BH0556-3.0 16-May-12	30BH0557-4.0 16-May-12
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)										
Benzo(a)anthracene	56-55-3	2.1		0.42	0.27	1.0	0.20	0.35	0.24	0.71
Benzo(a)pyrene	50-32-8	0.21		0.44	0.38	1.2	0.31	0.59	0.33	1.1
Benzo(b)fluoranthene	205-99-2	2.1		0.63	0.51	1.6	0.44	0.89	0.47	1.4
Benzo(k)fluoranthene	207-08-9	21		0.20	0.20	0.51	0.16	0.24	0.14	0.42
Chrysene	218-01-9	210		0.46	0.31	1.1	0.24	0.43	0.28	0.85
Dibenzo(a,h)anthracene	53-70-3	0.21		0.061	0.048	0.13	0.056	0.081	0.056	0.18
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.27	0.19	0.53	0.24	0.33	0.23	0.79
Total Benzo(a)pyrene Equivalent Concentration(A)										
B(a)P Equivalent			0.7	0.63546	0.52731	1.6492	0.45584	0.83083	0.48168	1.57505
ITRC Metals by Method 6010B (mg/kg)										
Arsenic	7440-38-2	1.6	12	ND	0.484	1.45	0.723	0.607	0.772	ND
Lead	7439-92-1	800	1400	8.74	33.6	91.9	8.16	39.7	18.1	17.6

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-12
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0558-1.5 16-May-12	30BH0560-2.5 18-May-12	30BH0562-2.0 16-May-12	30BH0563-4.0 16-May-12	30BH0564-2.5 16-May-12	30BH0565-2.0 16-May-12
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	2.1		3.6	0.41	14	75	0.18	0.58
Benzo(a)pyrene	50-32-8	0.21		4.1	0.69	16	89	0.24	0.69
Benzo(b)fluoranthene	205-99-2	2.1		6.2	0.99	22	120	0.34	1.1
Benzo(k)fluoranthene	207-08-9	21		2.1	0.30	7.6	41	0.13	0.29
Chrysene	218-01-9	210		4.0	0.56	16	79	0.21	0.66
Dibenzo(a,h)anthracene	53-70-3	0.21		0.49	0.11	1.7	12	0.028	0.089
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		1.7	0.43	5.7	47	0.11	0.33
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.7	5.765	0.98656	21.962	125.689	0.33251	0.98356
ITRC Metals by Method 6010B (mg/kg)									
Arsenic	7440-38-2	1.6	12	ND	ND	ND	1.48	ND	ND
Lead	7439-92-1	800	1400	46.5	52.2	101	332	65.3	127

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-12
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0567-4.0 16-May-12	30BH0568-2.5 16-May-12	30BH0568-2.5-a 16-May-12	30BH0569-2.5 18-May-12	30BH0570-1.0 16-May-12	30BH0573-1.0 15-May-12
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	2.1		1.1	1.1	1.9	3.8	0.19	2.7
Benzo(a)pyrene	50-32-8	0.21		1.4	1.3	2.3	4.7	0.29	3.6
Benzo(b)fluoranthene	205-99-2	2.1		2.0	1.7	3.4	5.9	0.4	4.9
Benzo(k)fluoranthene	207-08-9	21		0.57	0.62	1.0	2.2	0.14	1.6
Chrysene	218-01-9	210		1.2	1.1	2.1	3.8	0.23	2.7
Dibenzo(a,h)anthracene	53-70-3	0.21		0.22	0.14	0.26	0.64	0.048	0.44
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.87	0.61	1.1	2.1	0.21	1.7
Total Benzo(a)pyrene Equivalent Concentration									
B(a)P Equivalent		NA	0.7	2.0239	1.7883	3.2121	6.5458	0.41963	4.9887
ITRC Metals by Method 6010B (mg/kg)									
Arsenic	7440-38-2	1.6	12	ND	ND	ND	ND	0.723	ND
Lead	7439-92-1	800	1400	6.77	321	248	82.4	17.6	179

Notes:

mg/kg - milligrams per kilogram

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RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-12
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0574-2.0 16-May-12	30BH0576-3.0 16-May-12	30BH0577-1.5 16-May-12	30BH0578-1.0 16-May-12	30BH0580-3.5 15-May-12	30BH0582-1.5 16-May-12
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	2.1		1.2	0.26	0.28	0.94	0.24	2.7
Benzo(a)pyrene	50-32-8	0.21		1.5	0.39	0.32	1.4	0.35	3.6
Benzo(b)fluoranthene	205-99-2	2.1		2.1	0.59	0.48	2	0.64	5.1
Benzo(k)fluoranthene	207-08-9	21		0.76	0.17	0.14	0.56	0.17	1.8
Chrysene	218-01-9	210		1.4	0.31	0.32	1.2	0.32	3.1
Dibenzo(a,h)anthracene	53-70-3	0.21		0.17	0.044	0.046	0.21	0.046	0.39
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.67	0.18	0.21	0.94	0.17	1.6
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.7	2.076	0.53901	0.46472	2.0048	0.50302	4.9511
ITRC Metals by Method 6010B (mg/kg)									
Arsenic	7440-38-2	1.6	12	0.427	ND	0.861	0.771	ND	0.795
Lead	7439-92-1	800	1400	181	65.6	24.8	163	15.3	240

Notes:

mg/kg - milligrams per kilogram

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ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-12
EPA Industrial RSL/Florida Industrial SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID Date Collected	CAS Number	EPA RSLs (Industrial)	62-777 Industrial SCTL	30BH0584-2.0 16-May-12 Concentration	30BH0596-0.5 15-May-12 Concentration	30BH0605-1.0 18-May-12 Concentration	30BH0621-2.5 18-May-12 Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)							
Benzo(a)anthracene	56-55-3	2.1		0.49	0.20	0.048	1.3
Benzo(a)pyrene	50-32-8	0.21		0.74	0.44	0.049	1.4
Benzo(b)fluoranthene	205-99-2	2.1		1.0	0.62	0.076	1.9
Benzo(k)fluoranthene	207-08-9	21		0.32	0.17	0.024	0.66
Chrysene	218-01-9	210		0.57	0.28	0.049	1.4
Dibenzo(a,h)anthracene	53-70-3	0.21		0.13	0.065	0.036	0.18
Indeno(1,2,3-cd)pyrene	193-39-5	2.10		0.50	0.27	0.030	0.7
Total Benzo(a)pyrene Equivalent Concentration(A)							
B(a)P Equivalent		NA	0.7	1.07277	0.61598	0.082689	1.978
ITRC Metals by Method 6010B (mg/kg)							
Arsenic	7440-38-2	1.6	12	ND	1.72	4.02	ND
Lead	7439-92-1	800	1400	70.7	14.2	128	25.6

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

**Table 1-13
EPA Residential RSL/Florida Residential SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0647-1.0 11-May-12 A202666 Concentration	30BH0648-4.0 10-May-12 A202658 Concentration	30BH0648-4.0-a 10-May-12 A202658 Concentration	30BH0649-3.0 10-May-12 A202658 Concentration	30BH0651-1.0 15-May-12 A202738 Concentration	30BH0652-1.5 11-May-12 A202666 Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.020	0.066	0.11	0.30	0.33	0.068
Benzo(a)pyrene	50-32-8	0.015		0.017	0.078	0.14	0.34	0.45	0.088
Benzo(b)fluoranthene	205-99-2	0.15		0.025	0.1	0.18	0.49	0.71	0.13
Benzo(k)fluoranthene	207-08-9	1.5		ND	0.037	0.07	0.15	0.22	0.041
Chrysene	218-01-9	15		ND	0.069	0.11	0.34	0.39	0.073
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	0.020	0.048	0.047	0.034
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		ND	0.044	0.083	0.20	0.20	0.046
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent			0.1	0.040387	0.117939	0.19811	0.48884	0.62359	0.129883
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	0.485	0.354	ND	3050	0.518
Arsenic	7440-38-2	0.39	2.1	ND	0.632	0.557	ND	722	ND
Lead	7439-92-1	400	400	49.1	253	172	115	22700	157

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

**Table 1-13
EPA Residential RSL/Florida Residential SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0653-3.0 11-May-12 A202666 Concentration	30BH0655-1.5 10-May-12 A202658 Concentration	30BH0656-3.5 10-May-12 A202658 Concentration	30BH0658-1.0 10-May-12 A202658 Concentration	30BH0659-2.0 11-May-12 A202666 Concentration	30BH0660-2.5 11-May-12 A202666 Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		3.3	0.34	0.28	0.025	0.40	0.058
Benzo(a)pyrene	50-32-8	0.015		3.9	0.48	0.39	0.020	0.45	0.065
Benzo(b)fluoranthene	205-99-2	0.15		5.5	0.72	0.55	0.032	0.67	0.094
Benzo(k)fluoranthene	207-08-9	1.5		2.0	0.21	0.18	ND	0.20	0.036
Chrysene	218-01-9	15		3.5	0.39	0.32	0.019	0.44	0.056
Dibenzo(a,h)anthracene	53-70-3	0.015		0.48	0.049	0.053	0.034	0.052	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		1.8	0.21	0.22	0.013	0.22	0.032
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent			0.1	5.4635	0.65849	0.55012	0.044189	0.63344	0.100816
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	0.629	0.68	ND	0.401	ND
Arsenic	7440-38-2	0.39	2.1	ND	0.496	0.455	ND	ND	0.475
Lead	7439-92-1	400	400	6.24	164	360	117	157	189

Notes:

mg/kg - milligrams per kilogram

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Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs) as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

**Table 1-13
EPA Residential RSL/Florida Residential SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0660-2.5-a	30BH0661-3.0	30BH0662-3.5	30BH0662-3.5-a	30BH0663-1.0	30BH0664-1.0
Date Collected				11-May-12	10-May-12	10-May-12	10-May-12	10-May-12	10-May-12
SDG Number				A202666	A202658	A202658	A202658	A202658	A202658
				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.08	0.3	0.26	0.45	0.024	0.025
Benzo(a)pyrene	50-32-8	0.015		0.11	0.36	0.36	0.67	0.020	0.022
Benzo(b)fluoranthene	205-99-2	0.15		0.17	0.51	0.49	0.93	0.03	0.034
Benzo(k)fluoranthene	207-08-9	1.5		0.051	0.17	0.17	0.31	ND	0.013
Chrysene	218-01-9	15		0.088	0.33	0.3	0.52	0.017	0.019
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	0.049	0.041	0.081	ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.052	0.21	0.17	0.31	ND	0.016
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent			0.1	0.157798	0.51303	0.495	0.92362	0.044287	0.046649
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.664	0.379	0.801	0.577	ND	0.248
Arsenic	7440-38-2	0.39	2.1	0.489	ND	0.597	0.62	ND	ND
Lead	7439-92-1	400	400	189	50.7	277	125	35.2	102

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs) as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

**Table 1-13
EPA Residential RSL/Florida Residential SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0666-4.5 10-May-12 A202658 Concentration	30BH0667-2.5 11-May-12 A202666 Concentration	30BH0668-1.0 10-May-12 A202658 Concentration	30BH0669-3.5 10-May-12 A202658 Concentration	30BH0671-2.0 10-May-12 A202658 Concentration	30BH0672-3.0 10-May-12 A202658 Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.41	2.6	0.024	10	0.28	0.15
Benzo(a)pyrene	50-32-8	0.015		0.43	4.6	0.021	13	0.39	0.18
Benzo(b)fluoranthene	205-99-2	0.15		0.60	6.1	0.031	21	0.6	0.25
Benzo(k)fluoranthene	207-08-9	1.5		0.21	2	ND	5.4	0.19	0.092
Chrysene	218-01-9	15		0.45	3.3	0.017	11	0.33	0.17
Dibenzo(a,h)anthracene	53-70-3	0.015		0.061	0.61	ND	1.5	0.041	0.022
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.25	2.5	ND	5.0	0.18	0.097
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent			0.1	0.61955	6.3533	0.045942	18.165	0.53923	0.25279
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	ND	ND	0.79	0.473	0.42
Arsenic	7440-38-2	0.39	2.1	ND	ND	ND	0.303	0.494	0.374
Lead	7439-92-1	400	400	13.8	147	47.5	56.2	133	7.48

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs) as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

**Table 1-13
EPA Residential RSL/Florida Residential SCTL Exceedances: Area A
ERP Site FR038
Tyndall AFB, Florida**

Sample ID			62-777	30BH0673-3.5
Date Collected	CAS Number	EPA RSLs (Residential)	Residential	10-May-12
SDG Number			Criteria	A202658
			SCTL	Concentration
Carcinogenic PAHs ^A by Method 8270C SIM (mg/kg)				
Benzo(a)anthracene	56-55-3	0.15		0.13
Benzo(a)pyrene	50-32-8	0.015		0.14
Benzo(b)fluoranthene	205-99-2	0.15		0.19
Benzo(k)fluoranthene	207-08-9	1.5		0.067
Chrysene	218-01-9	15		0.14
Dibenzo(a,h)anthracene	53-70-3	0.015		0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.071
Total Benzo(a)pyrene Equivalent Concentration(A)				
B(a)P Equivalent			0.1	0.19691
ITRC Metals by Method 6010B (mg/kg)				
Antimony	7440-36-0	31	27	0.669
Arsenic	7440-38-2	0.39	2.1	ND
Lead	7439-92-1	400	400	50.5

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-14
EPA Residential RSL/Florida Residential SCTL Exceedances: Area B
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0678-1.0 14-May-12 A202692 Concentration	30BH0680-0.5 14-May-12 A202692 Concentration	30BH0681-0.5 14-May-12 A202692 Concentration	30BH0684-0.5 14-May-12 A202692 Concentration	30BH0685-0.5 14-May-12 A202692 Concentration
Carcinogenic PAHs ^A (mg/kg)								
Benzo(a)anthracene	56-55-3	0.15		0.029	0.024	0.034	0.022	0.025
Benzo(a)pyrene	50-32-8	0.015		0.031	0.019	0.035	0.020	0.026
Benzo(b)fluoranthene	205-99-2	0.15		0.053	0.032	0.046	0.033	0.041
Benzo(k)fluoranthene	207-08-9	1.5		0.015	0.034	0.020	ND	ND
Chrysene	218-01-9	15		0.027	0.018	0.030	0.016	0.022
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.016	0.015	0.023	0.016	0.014
Total Benzo(a)pyrene Equivalent Concentration(A)								
B(a)P Equivalent			0.1	0.057477	0.043288	0.06253	0.043781	0.050687
ITRC Metals by Method 6010B (mg/kg)								
Antimony	7440-36-0	31	27	ND	0.752	1.02	0.449	ND
Arsenic	7440-38-2	0.39	2.1	ND	3.33	6.17	ND	ND
Lead	7439-92-1	400	400	70.2	9.74	18.4	56	30.8

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-15
EPA Residential RSL/Florida Residential SCTL Exceedances: Area C
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0674-0.5 14-May-12 A202692 Concentration	30BH0676-1.0 12-May-12 A202695 Concentration
Carcinogenic PAHs ^A (mg/kg)					
Benzo(a)anthracene	56-55-3	0.15		0.020	ND
Benzo(a)pyrene	50-32-8	0.015		0.013	ND
Benzo(b)fluoranthene	205-99-2	0.15		0.019	ND
Benzo(k)fluoranthene	207-08-9	1.5		ND	ND
Chrysene	218-01-9	15		ND	ND
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		ND	ND
Total Benzo(a)pyrene Equivalent Concentration(A)					
B(a)P Equivalent		NA	0.1	0.0352315	ND
ITRC Metals by Method 6010B (mg/kg)					
Antimony	7440-36-0	31	27	0.283	0.407
Arsenic	7440-38-2	0.39	2.1	0.478	0.488
Lead	7439-92-1	400	400	63.4	6.38

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0551-2.0 16-May-12 A202782	30BH0552-1.0 16-May-12 A202758	30BH0553-2.0 16-May-12 A202758	30BH0554-1.0 16-May-12 A202758	30BH0555-1.5 16-May-12 A202758	30BH0556-3.0 16-May-12 A202758
SDG Number				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Carcinogenic PAHs^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.42	0.27	1.0	0.20	0.35	0.24
Benzo(a)pyrene	50-32-8	0.015		0.44	0.38	1.2	0.31	0.59	0.33
Benzo(b)fluoranthene	205-99-2	0.15		0.63	0.51	1.6	0.44	0.89	0.47
Benzo(k)fluoranthene	207-08-9	1.5		0.20	0.20	0.51	0.16	0.24	0.14
Chrysene	218-01-9	15		0.46	0.31	1.1	0.24	0.43	0.28
Dibenzo(a,h)anthracene	53-70-3	0.015		0.061	0.048	0.13	0.056	0.081	0.056
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.27	0.19	0.53	0.24	0.33	0.23
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.63546	0.52731	1.6492	0.45584	0.83083	0.48168
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	1.12	ND	2.06	ND	1.09	ND
Arsenic	7440-38-2	0.39	2.1	ND	0.484	1.45	0.723	0.607	0.772
Lead	7439-92-1	400	400	8.74	33.6	91.9	8.16	39.7	18.1

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0557-4.0 16-May-12 A202738 Concentration	30BH0558-1.5 16-May-12 A202758 Concentration	30BH0559-2.5 16-May-12 A202738 Concentration	30BH0560-2.5 18-May-12 A202782 Concentration	30BH0562-2.0 16-May-12 A202758 Concentration	30BH0563-4.0 16-May-12 A202758 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.71	3.6	0.12	0.41	14	75
Benzo(a)pyrene	50-32-8	0.015		1.1	4.1	0.16	0.69	16	89
Benzo(b)fluoranthene	205-99-2	0.15		1.4	6.2	0.22	0.99	22	120
Benzo(k)fluoranthene	207-08-9	1.5		0.42	2.1	0.079	0.30	7.6	41
Chrysene	218-01-9	15		0.85	4.0	0.13	0.56	16	79
Dibenzo(a,h)anthracene	53-70-3	0.015		0.18	0.49	0.026	0.11	1.7	12
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.79	1.7	0.11	0.43	5.7	47
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	1.57505	5.765	0.23192	0.98656	21.962	125.689
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	ND	0.313	0.318	0.309	2.24
Arsenic	7440-38-2	0.39	2.1	ND	ND	ND	ND	ND	1.48
Lead	7439-92-1	400	400	17.6	46.5	15.3	52.2	101	332

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0564-2.5 16-May-12 A202738 Concentration	30BH0565-2.0 16-May-12 A202758 Concentration	30BH0566-3.0 16-May-12 A202758 Concentration	30BH0567-4.0 16-May-12 A202738 Concentration	30BH0568-2.5 16-May-12 A202738 Concentration	30BH0568-2.5-a 16-May-12 A202738 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.18	0.58	0.021	1.1	1.1	1.9
Benzo(a)pyrene	50-32-8	0.015		0.24	0.69	0.015	1.4	1.3	2.3
Benzo(b)fluoranthene	205-99-2	0.15		0.34	1.1	0.022	2.0	1.7	3.4
Benzo(k)fluoranthene	207-08-9	1.5		0.13	0.29	ND	0.57	0.62	1.0
Chrysene	218-01-9	15		0.21	0.66	ND	1.2	1.1	2.1
Dibenzo(a,h)anthracene	53-70-3	0.015		0.028	0.089	ND	0.22	0.14	0.26
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.11	0.33	ND	0.87	0.61	1.1
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.33251	0.98356	0.040409	2.0239	1.7883	3.2121
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.506	ND	0.789	ND	0.501	0.627
Arsenic	7440-38-2	0.39	2.1	ND	ND	0.714	ND	ND	3.85
Lead	7439-92-1	400	400	65.3	127	74.9	6.77	321	248

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0569-2.5 18-May-12 A202782 Concentration	30BH0570-1.0 16-May-12 A202738 Concentration	30BH0571-3.0 16-May-12 A202738 Concentration	30BH0572-2.0 16-May-12 A202758 Concentration	30BH0573-1.0 15-May-12 A202716 Concentration	30BH0574-2.0 16-May-12 A202738 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		3.8	0.19	0.030	ND	2.7	1.2
Benzo(a)pyrene	50-32-8	0.015		4.7	0.29	0.026	ND	3.6	1.5
Benzo(b)fluoranthene	205-99-2	0.15		5.9	0.4	0.039	ND	4.9	2.1
Benzo(k)fluoranthene	207-08-9	1.5		2.2	0.14	0.015	ND	1.6	0.76
Chrysene	218-01-9	15		3.8	0.23	0.026	ND	2.7	1.4
Dibenzo(a,h)anthracene	53-70-3	0.015		0.64	0.048	ND	ND	0.44	0.17
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		2.1	0.21	0.017	ND	1.7	0.67
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	6.5458	0.41963	0.052276	ND	4.9887	2.076
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.529	0.398	0.388	ND	0.926	0.398
Arsenic	7440-38-2	0.39	2.1	ND	0.723	ND	0.664	ND	0.427
Lead	7439-92-1	400	400	82.4	17.6	67.7	97.3	179	181

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0575-3.0 16-May-12 A202738 Concentration	30BH0576-3.0 16-May-12 A202738 Concentration	30BH0577-1.5 16-May-12 A202738 Concentration	30BH0578-1.0 16-May-12 A202758 Concentration	30BH0578-1.0-a 16-May-12 A202758 Concentration	30BH0579-2.0 15-May-12 A202716 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.027	0.26	0.28	0.94	0.025	0.020
Benzo(a)pyrene	50-32-8	0.015		0.027	0.39	0.32	1.4	0.022	0.016
Benzo(b)fluoranthene	205-99-2	0.15		0.038	0.59	0.48	2	0.038	0.028
Benzo(k)fluoranthene	207-08-9	1.5		ND	0.17	0.14	0.56	ND	ND
Chrysene	218-01-9	15		0.022	0.31	0.32	1.2	0.019	ND
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	0.044	0.046	0.21	ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.015	0.18	0.21	0.94	0.020	ND
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.053707	0.53901	0.46472	2.0048	0.047994	0.040798
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.343	0.751	0.3	0.539	0.674	0.47
Arsenic	7440-38-2	0.39	2.1	ND	ND	0.861	0.771	0.653	ND
Lead	7439-92-1	400	400	78.3	65.6	24.8	163	155	43

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0580-3.5 15-May-12 A202716 Concentration	30BH0581-2.5 16-May-12 A202738 Concentration	30BH0582-1.5 16-May-12 A202738 Concentration	30BH0583-2.0 16-May-12 A202758 Concentration	30BH0583-2.0-a 16-May-12 A202758 Concentration	30BH0584-2.0 16-May-12 A202758 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.24	0.036	2.7	0.036	0.11	0.49
Benzo(a)pyrene	50-32-8	0.015		0.35	0.034	3.6	0.037	0.13	0.74
Benzo(b)fluoranthene	205-99-2	0.15		0.64	0.051	5.1	0.055	0.20	1.0
Benzo(k)fluoranthene	207-08-9	1.5		0.17	0.018	1.8	0.017	0.061	0.32
Chrysene	218-01-9	15		0.32	0.030	3.1	0.031	0.13	0.57
Dibenzo(a,h)anthracene	53-70-3	0.015		0.046	ND	0.39	ND	0.021	0.13
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.17	0.016	1.6	0.025	0.094	0.50
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.50302	0.06351	4.9511	0.067301	0.19214	1.07277
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	ND	1.63	0.433	1.03	ND
Arsenic	7440-38-2	0.39	2.1	ND	0.537	0.795	0.784	0.742	ND
Lead	7439-92-1	400	400	15.3	131	240	170	179	70.7

Notes:

mg/kg - milligrams per kilogram

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RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0585-3.0 17-May-12 A202758	30BH0586-2.5 17-May-12 A202758	30BH0587-0.5 15-May-12 A202716	30BH0588-0.5 15-May-12 A202716	30BH0589-1.0 15-May-12 A202716	30BH0591-3.5 16-May-12 A202738
Date Collected				Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
SDG Number									
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		ND	0.026	0.17	0.054	0.081	0.14
Benzo(a)pyrene	50-32-8	0.015		ND	0.021	0.20	0.073	0.099	0.17
Benzo(b)fluoranthene	205-99-2	0.15		ND	0.034	0.28	0.11	0.16	0.23
Benzo(k)fluoranthene	207-08-9	1.5		ND	ND	0.10	0.042	0.047	0.089
Chrysene	218-01-9	15		ND	0.020	0.19	0.060	0.085	0.15
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	0.031	ND	ND	0.017
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		ND	0.015	0.13	0.038	0.047	0.076
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	ND	0.0467	0.29019	0.11068	0.149355	0.23264
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	0.424	0.347	0.451	0.436	ND
Arsenic	7440-38-2	0.39	2.1	0.557	ND	0.534	0.37	0.664	ND
Lead	7439-92-1	400	400	10	125	48.8	78.6	30.9	60.5

Notes:

mg/kg - milligrams per kilogram

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NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0593-2.5 17-May-12 A202782 Concentration	30BH0596-0.5 15-May-12 A202716 Concentration	30BH0597-1.0 15-May-12 A202716 Concentration	30BH0598-3.0 15-May-12 A202716 Concentration	30BH0599-2.5 15-May-12 A202716 Concentration	30BH0599-2.5-a 15-May-12 A202716 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.034	0.20	0.072	ND	0.083	0.046
Benzo(a)pyrene	50-32-8	0.015		0.030	0.44	0.043	ND	0.10	0.053
Benzo(b)fluoranthene	205-99-2	0.15		0.051	0.62	0.17	ND	0.16	0.078
Benzo(k)fluoranthene	207-08-9	1.5		ND	0.17	0.17	ND	0.046	0.029
Chrysene	218-01-9	15		0.028	0.28	0.17	ND	0.090	0.045
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	0.065	0.17	ND	0.017	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.018	0.27	0.17	ND	0.07	0.040
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.061033	0.61598	0.153135	ND	0.14885	0.087235
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.479	0.623	0.702	ND	0.697	0.525
Arsenic	7440-38-2	0.39	2.1	0.567	1.72	0.895	0.428	0.918	0.42
Lead	7439-92-1	400	400	107	14.2	20.3	5.33	171	289

Notes:

mg/kg - milligrams per kilogram

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RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0600-2.5 15-May-12 A202716 Concentration	30BH0602-3.0 18-May-12 A202782 Concentration	30BH0602-3.0-a 18-May-12 A202782 Concentration	30BH0603-1.0 17-May-12 A202782 Concentration	30BH0605-1.0 18-May-12 A202782 Concentration	30BH0606-3.5 18-May-12 A202782 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.034	0.042	0.036	0.050	0.048	0.10
Benzo(a)pyrene	50-32-8	0.015		0.035	0.044	0.035	0.050	0.049	0.13
Benzo(b)fluoranthene	205-99-2	0.15		0.053	0.072	0.056	0.078	0.076	0.19
Benzo(k)fluoranthene	207-08-9	1.5		0.02	0.022	0.017	0.025	0.024	0.064
Chrysene	218-01-9	15		0.032	0.042	0.03	0.053	0.049	0.12
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	ND	ND	ND	0.022
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.025	0.028	0.022	0.035	0.030	0.081
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.063932	0.076962	0.0651	0.084103	0.082689	0.18986
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	0.728	0.842	1.08	1.09	0.36
Arsenic	7440-38-2	0.39	2.1	ND	0.853	1.25	0.614	4.02	0.473
Lead	7439-92-1	400	400	94	298	326	279	128	61.2

Notes:

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RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0607-2.5 18-May-12 A202782 Concentration	30BH0609-1.5 14-May-12 A202738 Concentration	30BH0610-0.5 14-May-12 A202716 Concentration	30BH0616-0.5 14-May-12 A202716 Concentration	30BH0611-2.5 15-May-12 A202738 Concentration	30BH0612-2.5 18-May-12 A202782 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.045	0.017	0.019	0.034	0.022	ND
Benzo(a)pyrene	50-32-8	0.015		0.055	0.0098	0.015	0.037	0.018	ND
Benzo(b)fluoranthene	205-99-2	0.15		0.08	0.022	0.026	0.062	0.027	ND
Benzo(k)fluoranthene	207-08-9	1.5		0.024	ND	ND	0.019	ND	ND
Chrysene	218-01-9	15		0.043	ND	ND	0.032	0.015	ND
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.035	ND	ND	0.022	ND	ND
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.089783	0.032587	0.0389425	0.065522	0.04345	ND
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.566	ND	ND	ND	ND	0.458
Arsenic	7440-38-2	0.39	2.1	0.681	0.43	0.712	ND	0.601	0.724
Lead	7439-92-1	400	400	196	44.3	36.5	79.3	66.3	98.7

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RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0613-3.0 18-May-12 A202782 Concentration	30BH0615-1.5 17-May-12 A202782 Concentration	30BH0615-1.5-a 17-May-12 A202782 Concentration	30BH0617-1.5 14-May-12 A202716 Concentration	30BH0618-3.5 18-May-12 A202782 Concentration	30BH0619-3.5 18-May-12 A202782 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		0.071	0.016	0.016	ND	ND	0.027
Benzo(a)pyrene	50-32-8	0.015		0.084	ND	0.0091	ND	ND	0.030
Benzo(b)fluoranthene	205-99-2	0.15		0.13	ND	ND	ND	ND	0.042
Benzo(k)fluoranthene	207-08-9	1.5		0.041	ND	ND	ND	ND	ND
Chrysene	218-01-9	15		0.074	ND	ND	ND	ND	0.022
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		0.050	ND	ND	ND	ND	0.017
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	0.127084	0.04582	0.0343145	ND	ND	0.056297
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	0.606	0.682	ND	ND	0.315	0.846
Arsenic	7440-38-2	0.39	2.1	0.636	1.01	1.08	0.482	0.68	ND
Lead	7439-92-1	400	400	76.4	117	111	10.2	125	214

Notes:

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SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0620-2.5 15-May-12 A202738 Concentration	30BH0620-2.5-a 15-May-12 A202738 Concentration	30BH0621-2.5 18-May-12 A202782 Concentration	30BH0622-2.0 17-May-12 A202782 Concentration	30BH0626-2.0 14-May-12 A202692 Concentration	30BH0626-2.0-a 14-May-12 A202692 Concentration
Carcinogenic PAHs ^A (mg/kg)									
Benzo(a)anthracene	56-55-3	0.15		ND	0.015	1.3	0.033	0.028	0.032
Benzo(a)pyrene	50-32-8	0.015		ND	0.0087	1.4	0.029	0.028	0.036
Benzo(b)fluoranthene	205-99-2	0.15		ND	ND	1.9	0.050	0.046	0.055
Benzo(k)fluoranthene	207-08-9	1.5		ND	ND	0.66	0.016	ND	0.015
Chrysene	218-01-9	15		ND	ND	1.4	0.029	0.026	0.030
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND	0.18	ND	ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		ND	ND	0.7	0.020	0.023	0.024
Total Benzo(a)pyrene Equivalent Concentration(A)									
B(a)P Equivalent		NA	0.1	ND	0.0326035	1.978	0.056989	0.054896	0.06478
ITRC Metals by Method 6010B (mg/kg)									
Antimony	7440-36-0	31	27	ND	0.229	ND	ND	0.534	0.469
Arsenic	7440-38-2	0.39	2.1	0.647	0.429	ND	ND	0.493	0.406
Lead	7439-92-1	400	400	33.6	26.8	25.6	63.6	153	146

Notes:

mg/kg - milligrams per kilogram

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Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

Table 1-16
EPA Residential RSL/Florida Residential SCTL Exceedances: Area D
ERP Site FR038
Tyndall AFB, Florida

Sample ID	CAS Number	EPA RSLs (Residential)	62-777 Residential Criteria SCTL	30BH0627-2.5 15-May-12 A202716 Concentration	30BH0637-0.5 14-May-12 A202692 Concentration
Carcinogenic PAHs ^A (mg/kg)					
Benzo(a)anthracene	56-55-3	0.15		ND	ND
Benzo(a)pyrene	50-32-8	0.015		ND	ND
Benzo(b)fluoranthene	205-99-2	0.15		ND	ND
Benzo(k)fluoranthene	207-08-9	1.5		ND	ND
Chrysene	218-01-9	15		ND	ND
Dibenzo(a,h)anthracene	53-70-3	0.015		ND	ND
Indeno(1,2,3-cd)pyrene	193-39-5	0.15		ND	ND
Total Benzo(a)pyrene Equivalent Concentration(A)					
B(a)P Equivalent		NA	0.1	ND	ND
ITRC Metals by Method 6010B (mg/kg)					
Antimony	7440-36-0	31	27	ND	ND
Arsenic	7440-38-2	0.39	2.1	0.418	0.471
Lead	7439-92-1	400	400	4.05	4.59

Notes:

mg/kg - milligrams per kilogram

Bold - indicates a detection

Shading - indicates an exceedance.

ND - indicates a non-detection

NR - Not Regulated under Chapter 62-777, F.A.C.

RSL - Regional Screening Level

SCTL - Soil Cleanup Target Level

PAH - Polynuclear Aromatic Hydrocarbons

^A Benzo(a)pyrene Toxicity Equivalent (TEQ) - The concentrations of the seven individual carcinogenic PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) for each sample location were multiplied by their respective Toxic Equivalent Factors (TEFs), as listed, to express these concentrations as benzo(a)pyrene TEQs. For purposes of calculating these TEQs, a proxy concentration of 1/2 the reporting limit was used for individual carcinogenic PAHs that were not detected. For each location where one or more carcinogenic PAHs were detected, the individual TEQs for each carcinogenic PAH at the location were summed to obtain the Total Benzo(a)pyrene Equivalent Concentration for the location. This concentration is screened against the FDEP SCTLs for benzo(a)pyrene.

**TABLE 2-1
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs
Tyndall AFB FR038 EE/CA**

Standard, Requirement, Criteria Or Limitation	Citation	Description	Applicable / Relevant and Appropriate	Comment
Solid Waste Disposal Act	42 USC Sec. 6901-6987			
Identification and Listing of Hazardous Waste	40 CFR Part 261	Defines criteria for those solid wastes which are subject to regulation as hazardous wastes under RCRA Subtitle C.	Yes	If any soil stockpiles are generated, TCLP analysis would be performed to determine if lead or arsenic are above toxicity characteristics. Laboratory analysis for PAHs also necessary.
"Contained-In Policy"	(63 FR 28618-28620; May 26, 1998) Management of soils containing hazardous waste	Contaminated media, of itself, is not hazardous waste. However, contaminated environmental media can be subject to regulation under RCRA if it "contains" hazardous waste (i.e., contains levels of contaminants that are above the toxicity characteristic hazardous waste criteria discussed above)	Yes	Environmental media (e.g., soils) containing hazardous waste must be managed as hazardous waste until it no longer contains the hazardous waste (i.e., it no longer exhibits a characteristic of hazardous waste or when concentrations are below risk-based levels).
Land Disposal Restrictions	40 CFR Part 268	Provides numerical and technology treatment standards for hazardous waste constituents that must be met prior to disposal.	Yes	Land disposal restrictions, depending on contaminant levels, could apply for disposal of contaminated soils.
EPA "Soil Screening Guidance," OSWER 9355.4-14FSA, June 1996, and "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites," OSWER 9355.4-24, December 2002		Numeric, risk-based, screening levels for soil using a future residential scenario are found in the Soil Screening Guidance. Generic screening levels provide most common contaminants at National Priorities List sites. Generic levels use conservative default assumptions and are more stringent than site-specific levels. Includes methodology for developing site-specific screening levels.	No	EPA Region 9 RSLs will be used as screening criteria for specific COCs. EPA RSLs are included in the TBC ARAR table.

TABLE 2-2
POTENTIAL STATE CHEMICAL-SPECIFIC ARARs
Tyndall AFB FR038 EE/CA

Standard, Requirement, Criteria Or Limitation	Citation	Description	Applicable / Relevant and Appropriate	Comment
Florida Hazardous Waste Rules - October, 1993	FAC Chapter 62-730	Similar to Federal hazardous waste regulations	Yes	See comments for federal hazardous waste regulation
Florida Rules on Hazardous Waste Warning Signs - July, 1991	FAC Chapter 62-736	Requires warning signs at NPL and FDEP identified hazardous waste sites to inform the public of the presence of potentially harmful conditions.	Yes	Signs are posted identifying Site FR038

**TABLE 2-3
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs
Tyndall AFB FR038 EE/CA**

Standard, Requirement, Criteria Or Limitation	Citation	Description	Applicable / Relevant and Appropriate	Comment
Comprehensive Environmental Response, Compensation, and Liability Act Off-Site Rule	42 USC s/s 9601 et seq	CERCLA is aimed at cleaning up sites with hazardous waste	Yes	
	40 CFR 300.440	CERCLA waste transferred offsite must be placed in a facility operating in compliance with the Resource Conservation and Recovery Act (RCRA) or other applicable Federal or State requirements. Under the "Off-Site Rule", the EPA Region determines the acceptability of each offsite waste disposal facility to accept CERCLA wastes.	Yes	Contaminated soils will be disposed of in an appropriate licensed Title C or Title D landfill, depending on treatment.
Solid Waste Disposal Act Identification and Listing of Hazardous Waste	42 USC Sec. 6901-6987	Defines those solid wastes which are subject to regulation as hazardous wastes.	Yes	Potential exists for solid wastes to be classified as hazardous wastes.
	40 CFR Part 261			
Standards Applicable to Generators of Hazardous Waste	40 CFR Part 262	Establishes standards for generators of hazardous waste/	Yes	Applicable to removal actions involving excavation and generation of hazardous waste onsite.
Pre-Transport Requirements	Subpart C	Establishes specific criteria for: - packaging - labeling - marking - placarding - accumulation areas	Yes	These requirements are applicable to hazardous waste that is held temporarily onsite prior to offsite disposal. Very specific requirements are discussed in the regulations, including labeling, management, training, etc. Consult the regulations for specific information.

**TABLE 2-3
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs
Tyndall AFB FR038 EE/CA**

Standard, Requirement, Criteria Or Limitation	Citation	Description	Applicable / Relevant and Appropriate	Comment
Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste.		See Discussion of specific subparts
Use and Management of Containers	Subpart I	Operating requirements for storing hazardous waste in containers. Containers of RCRA hazardous waste must: - Be maintained in good condition. - Be compatible with hazardous waste to be stored. - Be closed during storage except to add or remove waste. - Have adequate secondary containment when stored onsite. - Containers and/or containment system must be decontaminated once the waste is removed.	Yes	Potential exists for storage of hazardous waste in containers.
Waste Piles	Subpart L	Design and operating requirements for storing or treating hazardous waste in piles.	Yes	Contaminated soils classified as hazardous waste may be temporarily stored in piles on site.
Staging Piles	Subpart S	Design and operating requirements for an accumulation of solid, non-flowing remediation waste	Yes	Staging piles involving solid, non-flowing remediation waste could occur on-site
Land Disposal Restrictions	40 CFR Part 268	Identifies hazardous wastes that are restricted from land disposal	Yes	Landfill disposal may be required.
DOT Rules for Hazardous Materials Transport	49 CFR 107, 171.1-500	Regulates the transport of hazardous waste materials including packaging, shipping and placarding	Yes	Disposal of contaminated soils may involve transport of hazardous waste.

**TABLE 2-3
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs
Tyndall AFB FR038 EE/CA**

Standard, Requirement, Criteria Or Limitation	Citation	Description	Applicable / Relevant and Appropriate	Comment
Occupational Safety and Health Administration (OSHA) Requirements	20 CFR 1910, 1926 and 1904	Regulations provide occupational safety and health requirements applicable to workers engaged in onsite construction activities.	Yes	There will be workers engaged in onsite construction activities.
Military Munitions Rule	40 CFR 266 Subpart M	Specifies applicability of RCRA requirements and general storage, treatment, and disposal requirements for military munitions.	Yes	Recovery of munitions fragments may be involved in remediation action.
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment.	No	Applicable to remedial alternatives involving onsite landfilling of contaminated soils. Onsite landfilling is not part of the removal action.
Landfills	Subpart N	Design and operating requirements for hazardous waste landfills	No	No design or operation of hazardous waste landfills is involved.

**TABLE 2-4
ARARS TO BE CONSIDERED
Tyndall AFB FR038 EE/CA**

Standard, Requirement, Criteria Or Limitation	Citation	Description	Applicable / Relevant and Appropriate	Comment
Detailed Directive on Risk Assessment and Cleanup of Residential Soil Lead; Office of Solid Waste		The directive recommends that soil lead levels less than 400 mg/kg be considered safe for residential use. Above that level, the document suggests collecting certain types of data and modeling children's blood lead with the IEUBK model.	TBC	Residential RSL limits of 400 mg/kg may be considered as a cleanup criteria
Contaminant Cleanup Target Levels Rule	FAC Chapter 62-777, Table II Soil Cleanup Target Levels	This document provides guidance for soil, groundwater, and surface water cleanup levels that can be developed on a site-by-site basis in Florida.	TBC	While the EPA RSLs will be used to delineate contamination and determine removal, SCTLs will also be taken into consideration.
Contaminated Site Cleanup Criteria	Section 376.30701(2), F.S. FAC Chapter 62-780	This rule implements risk-based corrective action provisions for contaminants that have been released or discharged into the environment.	TBC	
EPA Region 9 Regional Screening Level		Region 9 RSLs are conservative, risk-based criteria for evaluating and cleaning up contaminated sites. EPA Region 9 has developed these risk-based concentrations for many constituents associated with contaminated sites.	TBC	RSLs may be useful screening tools for determining the extent and quantity of soil that may need to be remediated; these will be considered in the final action.

**Table 3-1
Identification and Screening of Potential Soil Remediation Technologies
ERP Site FR038
Tyndall AFB, Florida**

Technology	Effectiveness	Implementability	Cost	Retained for Evaluation (Yes or No)
No Action/Land Use Controls	Baseline technology. Effective for preventing direct contact exposure.	Interim Land Use Control Plan for ERP Site FR038 already established.	Low	Yes
Containment/Cover	Effective for eliminating direct contact. Also effective at preventing infiltration and thereby preventing migration of soil contaminants into the underlying groundwater. Requires ongoing surveillance and maintenance to ensure long-term integrity and protectiveness.	Readily implemented, proven technology.	Low	Yes
Excavation and Off-site Disposal	Effective for permanently removing site soil contamination; offsite protectiveness is dependent on disposal at a licensed disposal facility.	Readily implemented, proven technology. Offsite disposal availability depends on quantities and nature of waste soil (i.e., non-hazardous versus hazardous disposal). Transportation options are readily available.	Moderate - Subtitle D Landfill High - Subtitle C Landfill	Yes
Screening/Sieving	Effective at removing lead shot and clay pigeon fragments along with plant/root material, rocks, gravel, and sand which may reduce the overall volume of waste requiring treatment and/or disposal. Recycling of lead may offset overall project cost as well as meet Tyndall AFB sustainability goals.	Readily implemented, proven technology. Requires specialized equipment/vendors with limited availability.	Moderate	Yes
Solidification/Stabilization	Effective for the treatment of lead in soil to achieve TCLP standard (<5 mg/L), thereby allowing for disposal in a non-hazardous Subtitle D landfill	Readily implemented, proven technology. Requires bench-scale treatability study. Will generate greater material handling and the need for associated dust control. Adds additional mass of stabilization agent for disposal.	Moderate to High	Yes
Soil Flushing	Innovative technology. Achievement of adequate contact between soil flushing agent and contaminants is uncertain, multiple soil flushing agents are required to treat multiple contaminants (lead and PAHs), complete capture of soil flushing agents and contaminants is uncertain, which increases potential for contaminant migration into the underlying groundwater.	Not proven; demonstration pilot test needed prior to full-scale implementation. Requires specialized equipment/vendors with limited availability.	High	No

Notes:

- Shading denotes an eliminated technology.
- mg/L - milligrams per liter
- PAH - Polynuclear Aromatic Hydrocarbon
- TCLP - Toxicity Characteristic Leaching Procedure
- AFB - Air Force Base

Table 3-2
Cost Estimate Summary for Alternative 1
No Action/LUCs
ERP Site FR038
Tyndall Air Force Base, Florida

	Unit	Unit Cost	Cost
Total First Year Capital Cost			
Task 01: Continued LUCIP Implementation	1	\$2,700	\$2,700
Total First Year Capital Cost			\$2,700
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Cost	1	\$2,700	\$2,700
Task 01 Years 2 through 30	29 Years	\$2,700	\$50,000
Total Present Value Cost			\$53,000

Assumptions:

Task 01: Includes the following:

- Professional I to perform quarterly site inspections to verify Land Use Controls.
- Sign maintenance/replacement cost per year included.
- Quarterly 2-page Land Use Controls Implementation Status Report and 2 pages of photos.

Table 3-3
Cost Estimate Summary for Alternative 2A
LUCs, Industrial Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Continued LUCIP Implementation	1	\$2,700	\$2,700
Task 02: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 03: On-Site Activities	1	\$3,455,200	\$3,455,200
Task 04: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$3,490,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$3,490,000	\$3,490,000
Task 01 Years 2 through 30	29 Years	\$2,700	\$50,000
Total Present Value Cost			\$3,540,000

Assumptions:

Task 01: Includes the following:

- Professional I to perform quarterly site inspections to verify Land Use Controls.
- Quarterly 2-page Land Use Controls Implementation Status Report.
- Sign maintenance/replacement cost per year included.

Task 02: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 03: Includes the following:

- Transportation and disposal of soil in Subtitle C landfill (See attached detail sheets for additional information).
- Oversight for NTCRA, NTCRA BMP Implementation.
- Assumed duration of on-site activity = 4 weeks.

Task 04: Includes the following:

- Preparation of NTCRA Summary Report.

Table 3-4
Cost Estimate Summary for Alternative 2B
LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Continued LUCIP Implementation	1	\$2,700	\$2,700
Task 02: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 03: On-Site Activities	1	\$2,504,200	\$2,504,200
Task 04: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$2,530,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$2,530,000	\$2,530,000
Task 01 Years 2 through 30	29 Years	\$2,700	\$50,000
Total Present Value Cost			\$2,580,000

Assumptions:

Task 01: Includes the following:

- Professional I to perform quarterly site inspections to verify Land Use Controls.
- Sign maintenance/replacement cost per year included.
- Quarterly 2-page Land Use Controls Implementation Status Report.

Task 02: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 03: Includes the following:

- Transportation and disposal of soil in Subtitle D landfill (See attached detail sheets).
- Oversight for NTCRA, NTCRA BMP Implementation.
- Soil Treatment: Mechanical Separation and Stabilization (See attached detail sheets).
- Assumed duration of on-site activity = 5 weeks.

Task 04: Includes the following:

- Preparation of NTCRA Summary Report.

Table 3-5
Cost Estimate Summary for Alternative 3A
Residential Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 02: On-Site Activities	1	\$7,683,000	\$7,683,000
Task 03: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$7,710,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$7,710,000	\$7,710,000
Total Present Value Cost			\$7,710,000

Assumptions:

Task 01: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 02: Includes the following:

- Transportation and disposal of soil in Subtitle C landfill (See attached detail sheets).
- Oversight for NTCRA, NTCRA removal action BMP Implementation.
- Assumed duration of on-site activity = 5 weeks.

Task 03: Includes the following:

- Preparation of NTCRA Summary Report.

Table 3-6
Cost Estimate Summary for Alternative 3B
Residential Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 02: On-Site Activities	1	\$5,447,700	\$5,447,700
Task 03: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$5,480,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$5,480,000	\$5,480,000
Total Present Value Cost			\$5,480,000

Assumptions:

Task 01: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 02: Includes the following:

- Transportation and disposal of soil in Subtitle D landfill (See attached detail sheets).
- Oversight for NTCRA, NTCRA BMP Implementation.
- Soil Treatment: Mechanical Separation and Stabilization (See attached detail sheets).
- Assumed duration of on-site activity = 6 weeks.

Task 03: Includes the following:

- Preparation of NTCRA Summary Report.

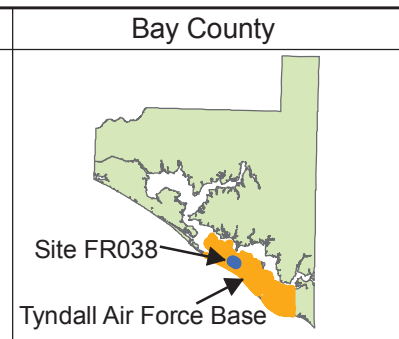
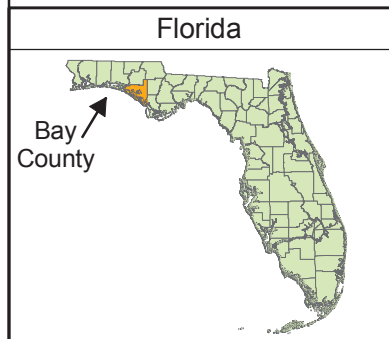
**Table 4-1
Comparative Analysis Summary for Non-Time-Critical Removal Action Alternatives
ERP Site FR038
Tyndall AFB, Florida**

Criteria	Alternative 1 No Action/LUCs	Alternative 2 LUCs, Soil Removal to Industrial RSLs and Disposal	Alternative 3 Soil Removal to Residential RSLs, and Disposal
Overall Protectiveness			
Human Health Protection	Interim LUCs currently in place to prevent exposure to contaminated soils, quarterly LUC monitoring. Least protective alternative since no direct treatment or containment is occurring. High potential for direct exposure.	Human health risk controlled during NTCRA activities via LUCs. Removal of contaminated soils exceeding Industrial RSLs protect human health. Continuation of LUC program also provides additional protection.	Human health risk controlled during NTCRA activities via LUCs. Afterwards, removal of contaminated soils exceeding Residential RSLs protect human health. LUCs no longer necessary after removal of all Residential RSL exceedances. This alternative would be the most protective of human health.
Environmental Protection	Does not include any protection for the environment.	Provides protection for the environment, as some of the contaminant source material and contaminated soils are removed.	Provides the most protection for the environment as the contaminant source material and contaminated soils are removed to Residential RSLs.
Compliance with ARARs and Other Criteria, Advisories, and Guidance			
Chemical-Specific ARARs	Warning signs are posted at the site informing of the presence of harmful conditions. Already exist because interim LUCs are already in place. Maintenance and/or repair to warning signs conducted.	Same requirements as Alternative 1 with respect to signage. ARARs dealing with hazardous waste designations may apply during NTCRA activities.	Same requirements as Alternative 1 with respect to signage. ARARs dealing with hazardous waste designations may apply during NTCRA activities.
Action-Specific ARARs	No action-specific ARARs apply.	Most of the Action-Specific ARARs apply to this alternative and deal with the proper transport, handling, stockpiling, and disposal requirements of waste classified as hazardous. Compliance with these ARARs would be addressed as part of the work plan for the proposed removal/disposal actions.	Most of the Action-Specific ARARs apply to this alternative and deal with the proper transport, handling, stockpiling, and disposal requirements of waste classified as hazardous. Compliance with these ARARs would be addressed as part of the work plan for the proposed removal/disposal actions.
TBC Information	Not applicable.	This alternative would comply with the TBCs pertaining to contaminated site cleanup, EPA Industrial RSLs, and FDEP Industrial SCTLs.	This alternative would comply with the TBCs pertaining to contaminated site cleanup, EPA Residential RSLs, and FDEP Residential SCTLs.
Reduction of Toxicity, Mobility, or Volume Through Treatment			
Treatment Process Used	None.	Alternative 2A: No treatment would occur. Alternative 2B: Mechanical separation and stabilization used to prepare the soil for disposal in a Subtitle D landfill.	Alternative 3A: No treatment would occur. Alternative 3B: Mechanical separation and stabilization used to prepare the soil for disposal in a Subtitle D landfill.
Reduction of Toxicity, Mobility, or Volume	No reduction of toxicity, mobility or volume would occur.	Removal of contaminated soils to achieve Industrial RSLs would greatly reduce the volume of contaminant source material and contaminated soil remaining on site.	Removal of contaminated soils to achieve Residential RSLs would eliminate contaminant source materials and contaminated soil to the most conservative standards.
Irreversible Treatment	None.	Irreversible for source materials and soils disposed in a permitted landfill.	Irreversible for source materials and soils disposed in a permitted landfill.
Short-Term Effectiveness			
Community Protection	Risk to community is not increased, but direct exposure is still possible, as there is no reduction of contaminated soils and source materials.	Risk to community is reduced by this alternative due to removal activities and continuation of LUCs	Risk to community is minimal because all contamination is removed.
Worker Protection	No significant risk posed to workers.	Workers would be effectively protected during the removal activities.	Workers would be effectively protected during the removal activities.
Environmental Protection	Not effective in environmental protectiveness.	LUCs in place for NTCRA activities would effectively protect the environment.	LUCs in place for NTCRA activities would effectively protect the environment.
Time to Reach Cleanup Goals	Cleanup goals would never be reached with this alternative.	Cleanup goals (Industrial RSLs and Industrial SCTLs) would be achieved within 1 year; however, soil contamination above Residential RSLs and Residential SCTLs would remain.	Cleanup goals would be achieved within 1 year.

**Table 4-1
Comparative Analysis Summary for Non-Time-Critical Removal Action Alternatives
ERP Site FR038
Tyndall AFB, Florida**

Criteria	Alternative 1 No Action/LUCs	Alternative 2 LUCs, BMPs, Containment/Cover, Soil Removal to Industrial RSLs and Disposal	Alternative 3 LUCs, BMPs, Containment/Cover, Soil Removal to Residential RSLs, and Disposal
Long-Term Effectiveness and Permanence			
Magnitude of Residual Risk	The magnitude of residual risk would lessen somewhat due to continued implementation of LUCs.	The magnitude of residual risk would be significantly lessened by the removal of contaminated soils to Industrial RSLs and continuation of LUCs.	The magnitude of residual risk would be significantly lessened by the removal of source materials and contaminated soils to Residential RSLs.
Adequacy and Reliability of Controls	LUCs would limit risk to human health, but the potential for exposure still exists due to ongoing presence of contamination.	LUCs would adequately and reliably control exposure, as long as they are sufficiently maintained.	Following the completion of NTCRA activities, no controls would be required.
Implementability			
Ability to Construct and Operate	No construction or operation required.	Monitoring would be necessary as part of implementation of NTCRA activities. These activities are readily implementable. Under Alternative 2B, mechanical separation and stabilization would be required.	Monitoring would be necessary as part of NTCRA activities. These activities are readily implementable. Under Alternative 3B, mechanical separation and stabilization would be required.
Ease of Doing More Action if Needed	Easy to implement additional action(s).	Additional remediation components are not anticipated to be necessary, but implementation of additional components would be difficult.	Additional remediation components are not anticipated to be necessary, but implementation of additional components would be difficult.
Ability to Monitor Effectiveness	Quarterly LUC monitoring program is already established for the Site.	Monitoring during NTCRA activities is easily implementable. Quarterly LUC monitoring program already established for the Site.	Monitoring during NTCRA activities is easily implementable. Quarterly LUC monitoring program already established for the Site. LUC program would no longer be necessary following completion of removal activities.
Ability to Obtain Approvals and Coordinate with Other Agencies	None required.	Coordination with permitted landfill, including waste profiling would be necessary.	Coordination with permitted landfill, including waste profiling would be necessary.
Availability of Services and Capacities	None required.	Oversight for NTCRA soil removal, treatment (Alternative 2B), and disposal would be necessary. Contractors are readily available to perform labor tasks (excavation, separation, stabilization, transportation, disposal).	Oversight for NTCRA soil removal, treatment (Alternative 3B), and disposal would be necessary. Contractors readily available to perform labor tasks (excavation, separation, stabilization, transportation, disposal).
Cost			
30-Year Present Worth Cost	\$53,000	2A = \$3,540,000 2B = \$2,580,000	3A = \$7,660,000 3B = \$5,420,000

FIGURES



Legend

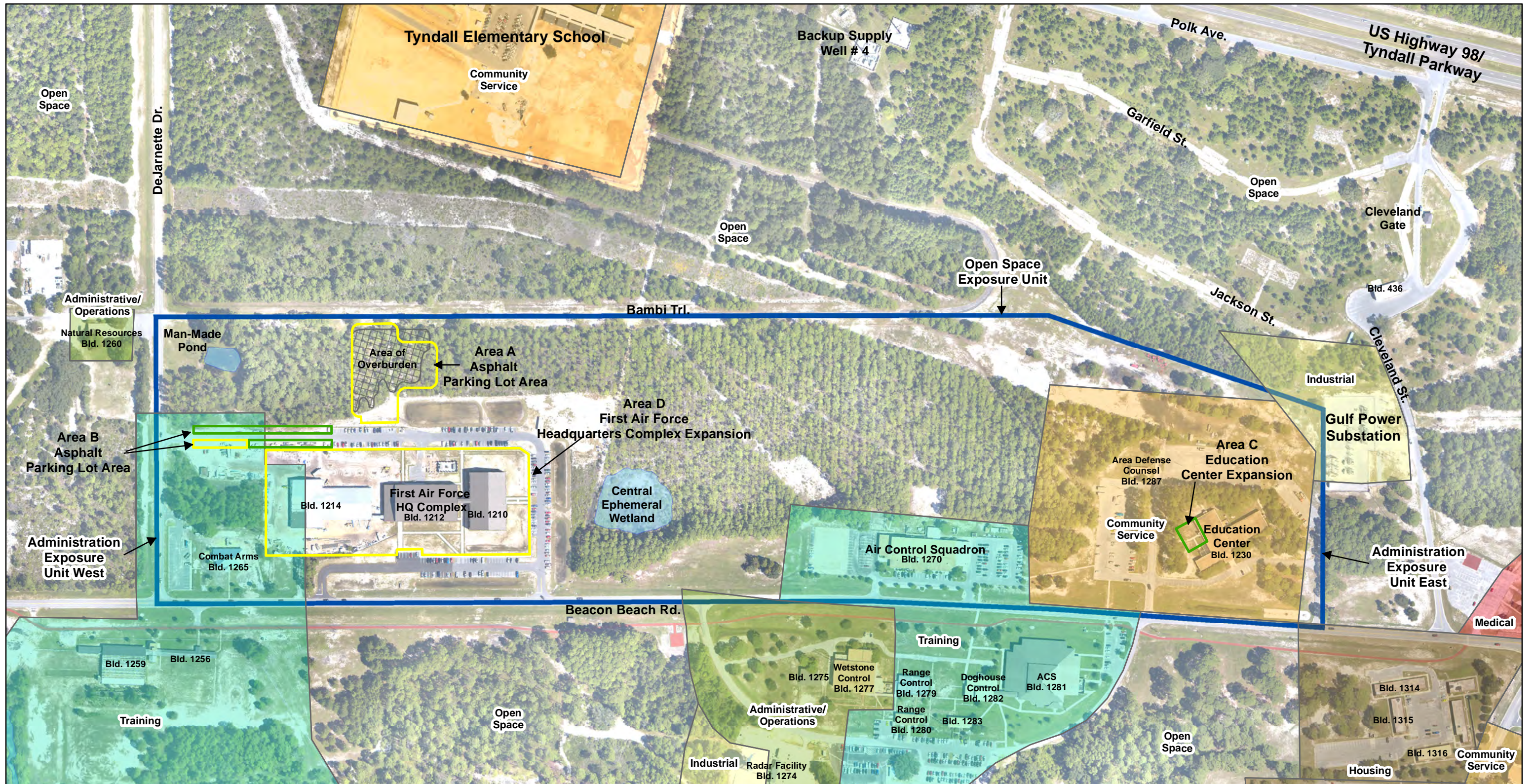
- Major Roads
- ▭ Tyndall Air Force Base Outline

2008 Aerial Photography Source: i-cubed 2010

Absolute Scale
1:105,000

Scale In Miles

FIGURE 1-1
SITE ID FR038 (OU15)
SITE LOCATION MAP
TYNDALL AIR FORCE BASE, FLORIDA



Legend

- Surface Water (Ephemeral Wetland Included)
- Development Area
- NON-NTCRA Area
- Current Site FR038 Boundary

Land Use Areas

- Administrative/Operations
- Community Service
- Housing
- Industrial
- Medical
- Open Space
- Training

Notes: Depth to groundwater less than 5 feet
 Future land use within FR038 does not include medical, housing, or outdoor recreation.
 NTCRA - Non-Time Critical Removal Action Source:
 Tyndall-1 Area Development Plan (Black & Veatch, August 2006).
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base.

N

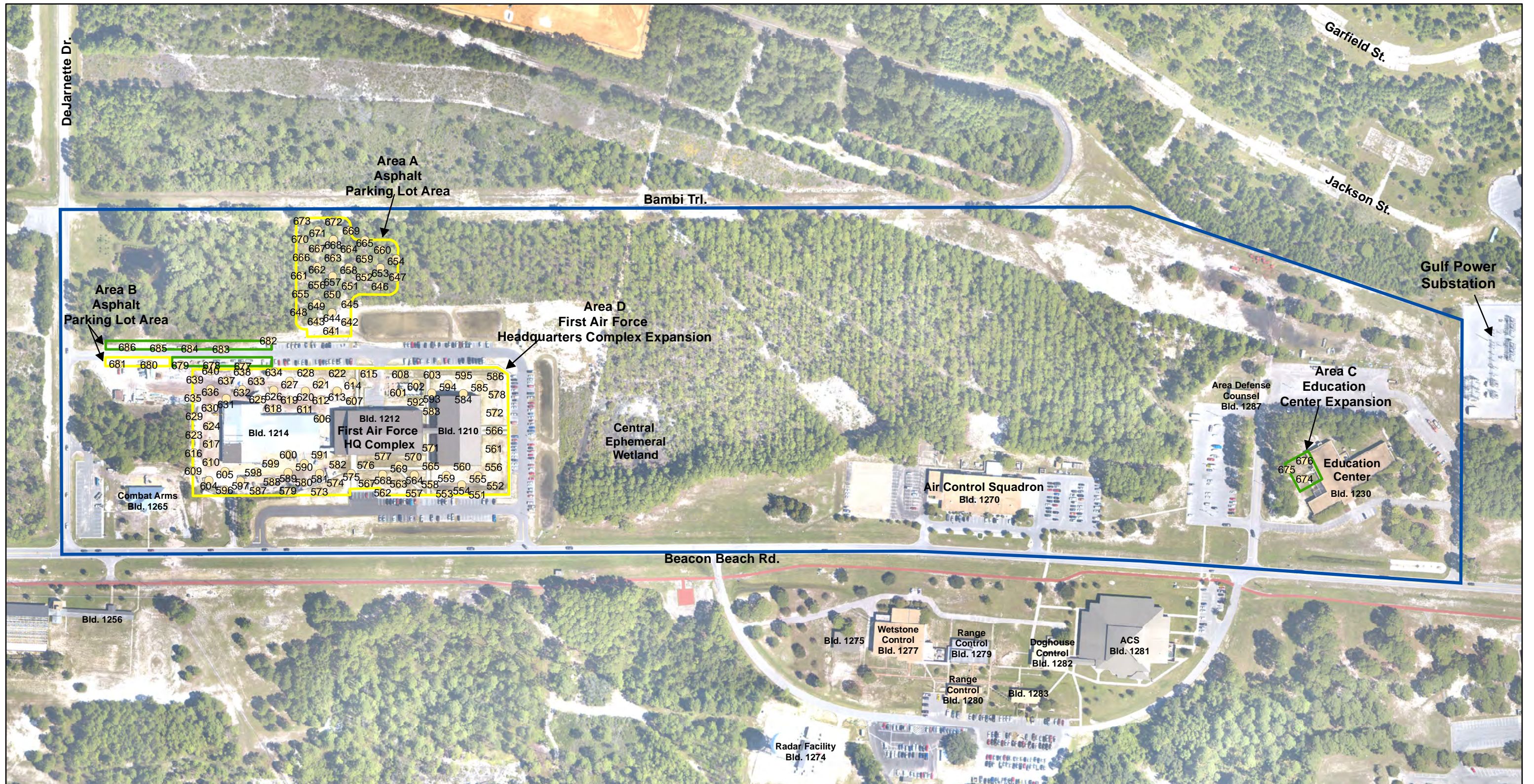
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Scale In Feet

0 150 300 600

FIGURE 1-2
SITE ID FR038 (OU 15)
LAND USE AND DESIGNATED
DEVELOPMENT AREAS

TYNDALL AIR FORCE BASE,
FLORIDA



- Legend**
- Field Screening/Soil Sampling Location
 - Development Area
 - NON-NTCRA Area
 - Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base



Absolute Scale
 1:3,000

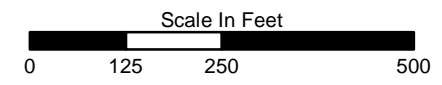
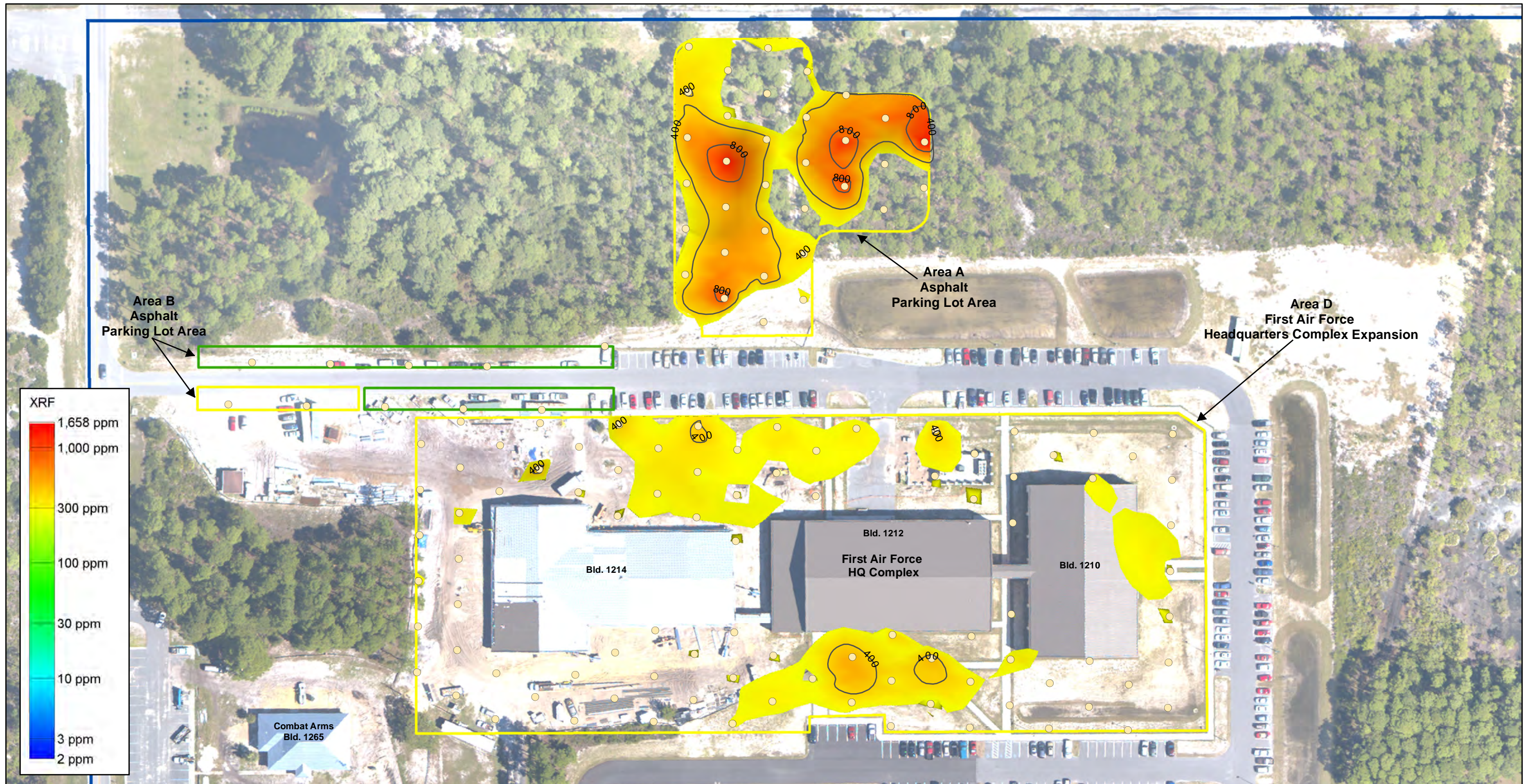


FIGURE 1-3
SITE ID FR038 (OU 15)
**FIELD SCREENING/
 SOIL SAMPLING LOCATIONS**

TYNDALL AIR FORCE BASE,
 FLORIDA





Legend

- Field Screening/Soil Sampling Location
- 400 ppm Contour Line
- 800 ppm Contour Line
- ▭ Development Area
- ▭ NON-NTCRA Area
- ▭ Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base



Absolute Scale
 1:1,200

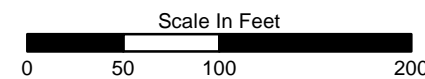
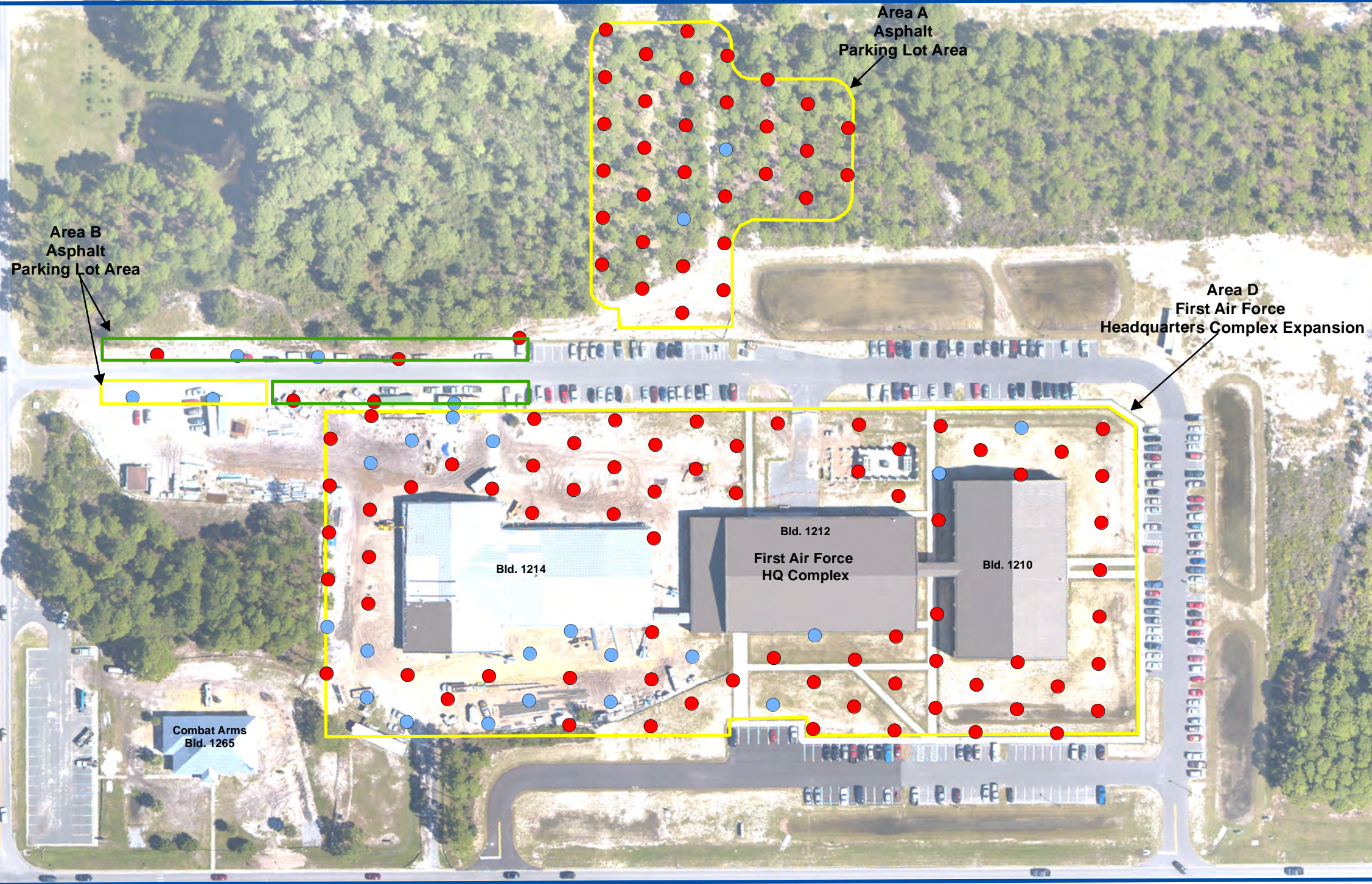


FIGURE 1-4
SITE ID FR038 (OU 15)
FIELD SCREENING RESULTS -
XRF GREATER THAN 280 PPM - SURFACE
AREAS A, B, AND D

TYNDALL AIR FORCE BASE,
 FLORIDA





Legend

- Soil Sampling Location
- Field Screening/Soil Sampling Location with Observed Lead Shot and/or Clay Pigeon
- Development Area
- NON-NTCRA Area
- Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base



Absolute Scale
 1:1,440

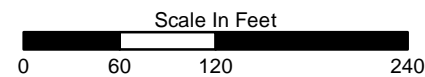


FIGURE 1-5
SITE ID FR038 (OU 15)
LEAD SHOT AND CLAY PIGEON
OBSERVATIONS
AREAS A, B, AND D

TYNDALL AIR FORCE BASE,
 FLORIDA





Legend

- Soil Sampling Location
- Field Screening/Soil Sampling Location with Observed Lead Shot and/or Clay Pigeon
- NON-NTCRA Area
- Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base



Absolute Scale
 1:1,200

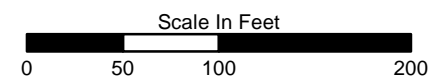
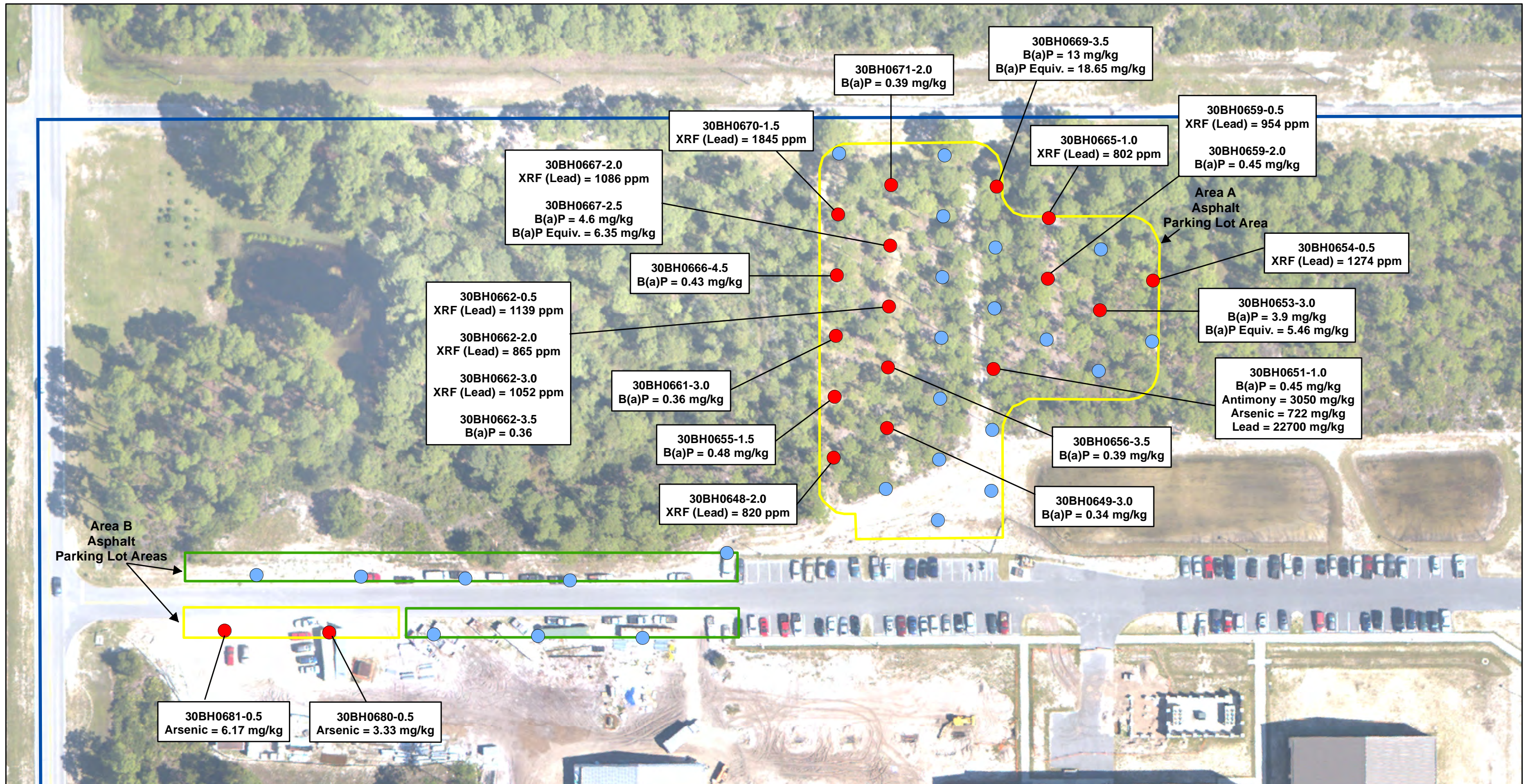


FIGURE 1-6
SITE ID FR038 (OU 15)
LEAD SHOT AND CLAY PIGEON
OBSERVATIONS
AREA C

TYNDALL AIR FORCE BASE,
 FLORIDA





Legend

- Field Screening/Soil Sampling Location Exceeding Industrial RSL/Florida Industrial SCTLs (30BH0681-0.5 = Sample ID - Sample Collection Depth)
- Field Screening/Soil Sampling Location
- Development Area
- NON-NTCRA Area
- Current Site FR038 Boundary
If no values are shown, no exceedance of Industrial RSL/Florida Industrial SCTL detected at that sample location.

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base
 Regional Screening Level (RSL) Table (USEPA, April 2012)
 Soil Cleanup Target Level (SCTL) Table (FDEP, April 2005)

Industrial SCTL B(a)P Equivalency	0.7 mg/kg
Industrial RSL B(a)P	0.21mg/kg
Industrial RSL Antimony	410 mg/kg
Industrial RSL Arsenic	1.6 mg/kg
Industrial RSL Lead	800 mg/kg

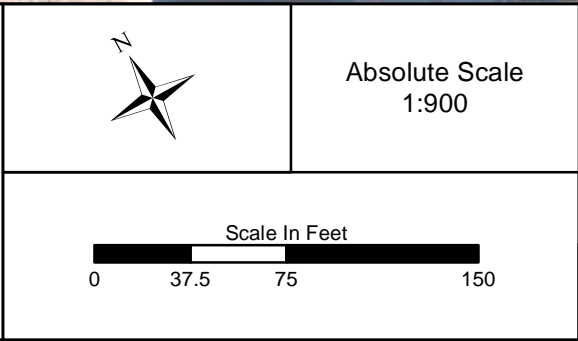
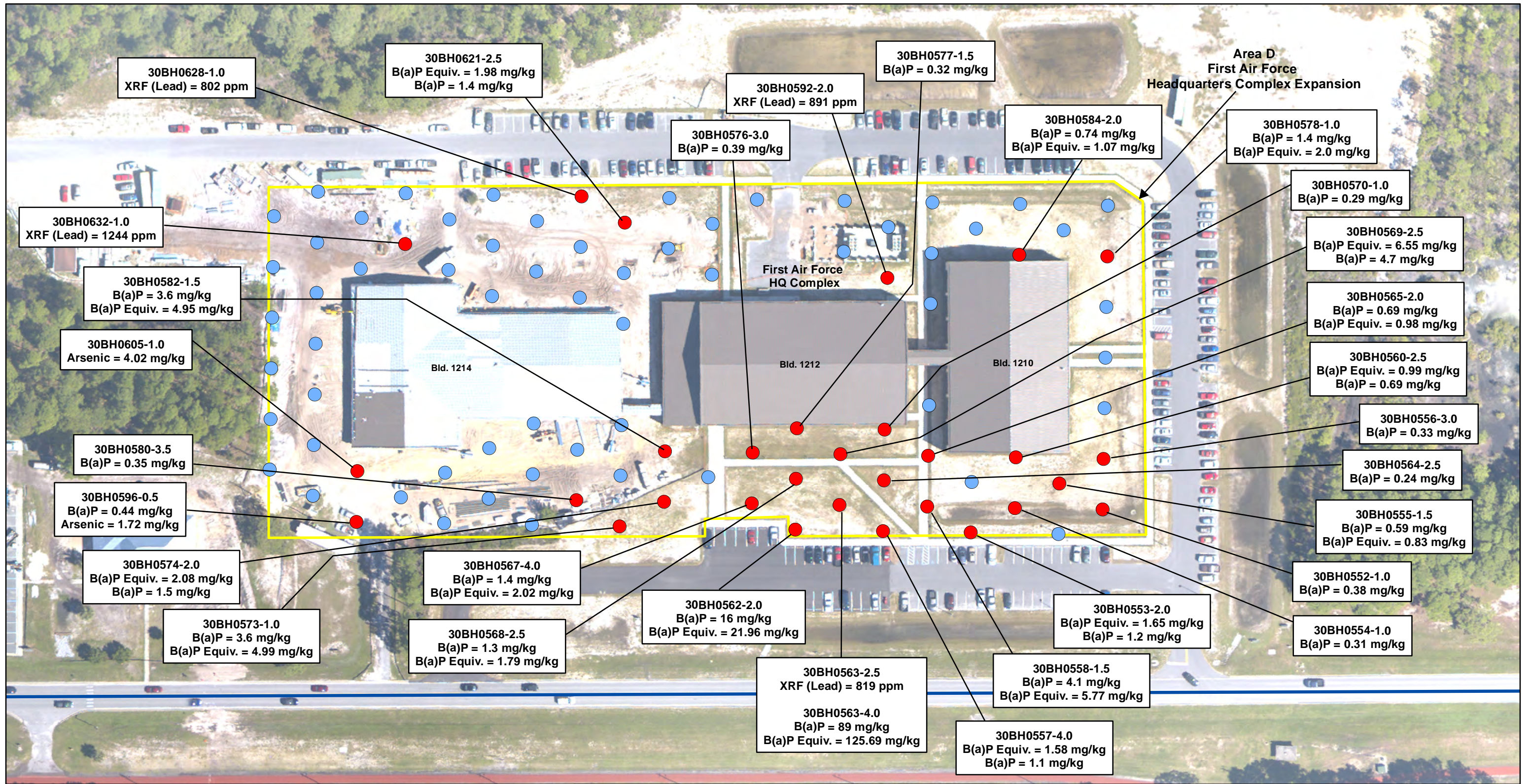


FIGURE 1-7
SITE ID FR038 (OU 15)
EXCEEDANCES ABOVE EPA INDUSTRIAL
RSL/FLOIDA INDUSTRIAL SCTL VALUES
AREAS A AND B

TYNDALL AIR FORCE BASE,
FLORIDA



Legend

- Field Screening/Soil Sampling Location Exceeding Industrial RSL/Florida Industrial SCTLs (30BH0573-1.0 = Sample ID - Sample Collection Depth)
- Soil Sampling Location
- ▭ Development Area
- ▭ Current Site FR038 Boundary

If no values are shown, no exceedance of Industrial RSL/Florida Industrial SCTL detected at that sample location.

Notes:
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base

Regional Screening Level (RSL) Table (USEPA, April 2012)
 Soil Cleanup Target Level (SCTL) Table (FDEP, April 2005)

Industrial SCTL B(a)P Equivalency	0.7 mg/kg
Industrial RSL B(a)P	0.21mg/kg
Industrial RSL Arsenic	1.6 mg/kg
Industrial RSL Lead	800 mg/kg

Absolute Scale
1:1,080

Scale In Feet
0 40 80 160

FIGURE 1-8
SITE ID FR038 (OU 15)
EXCEEDANCES ABOVE EPA INDUSTRIAL
RSL/FLOIDA INDUSTRIAL SCTL VALUES
AREA D

TYNDALL AIR FORCE BASE,
FLORIDA



Legend

- Field Screening/Soil Sampling Location Exceeding Industrial RSL/Florida Industrial SCTLs (30BH0573-1.0 = Sample ID - Sample Collection Depth)
- Soil Sampling Location
- NON-NTCRA Area
- Current Site FR038 Boundary

If no values are shown, no exceedance of Industrial RSL/Florida Industrial SCTL detected at that sample location.

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base

Regional Screening Level (RSL) Table (USEPA, April 2012)
 Soil Cleanup Target Level (SCTL) Table (FDEP, April 2005)

Industrial SCTL B(a)P Equivalency	0.7 mg/kg
Industrial RSL B(a)P	0.21 mg/kg
Industrial RSL Arsenic	1.6 mg/kg
Industrial RSL Lead	800 mg/kg

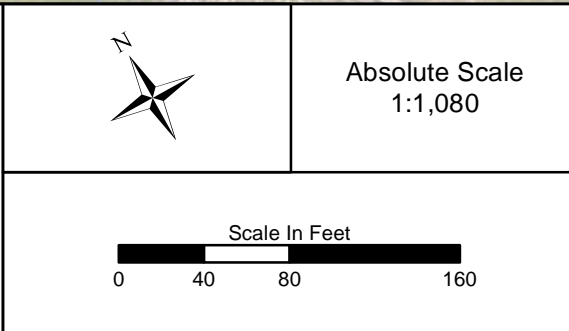


FIGURE 1-9
SITE ID FR038 (OU 15)
EXCEEDANCES ABOVE EPA INDUSTRIAL
RSL/FLORIDA INDUSTRIAL SCTL VALUES
AREA C

TYNDALL AIR FORCE BASE,
 FLORIDA



Legend

- Field Screening/Soil Sampling Location Exceeding Residential RSL/Florida Residential SCTLs
- Soil Sampling Location
- Development Area
- NON-NTCRA Area
- Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base

Regional Screening Level (RSL) Table (USEPA, April 2012)
 Soil Cleanup Target Level (SCTL) Table (FDEP, April 2005)



Absolute Scale
1:900

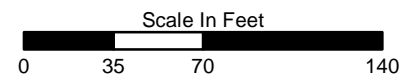
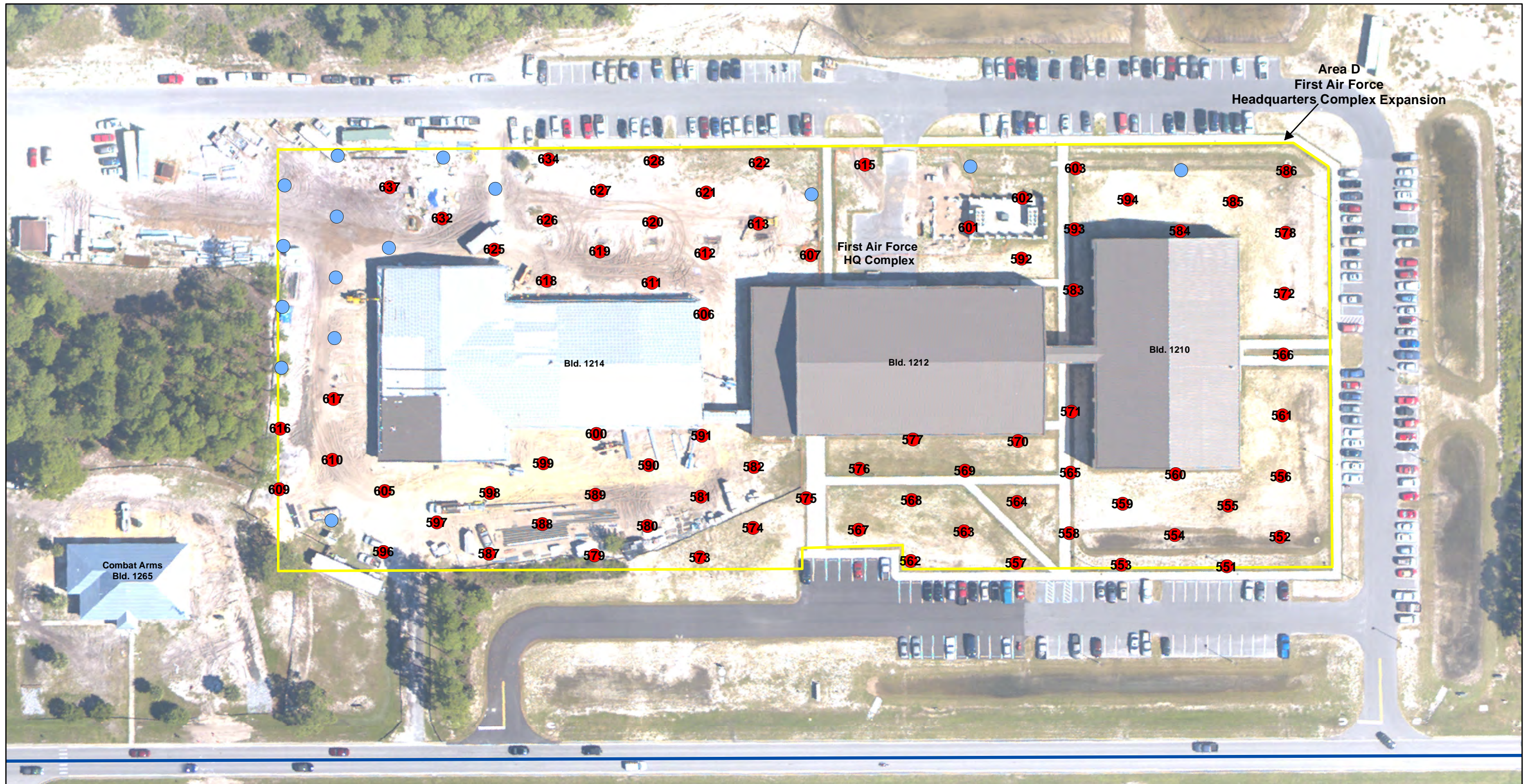


FIGURE 1-10
SITE ID FR038 (OU 15)
EXCEEDANCES ABOVE
EPA RESIDENTIAL RSL/
FLORIDA RESIDENTIAL SCTL VALUES
AREAS A AND B

TYNDALL AIR FORCE BASE,
FLORIDA





Legend

- Field Screening/Soil Sampling Location Exceeding Residential RSL/Florida Residential SCTLs
- Soil Sampling Location
- Development Area
- Current Site FR038 Boundary

Notes:
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base

Regional Screening Level (RSL) Table (USEPA, April 2012)
 Soil Cleanup Target Level (SCTL) Table (FDEP, April 2005)

Absolute Scale
1:900

Scale In Feet

FIGURE 1-11
 SITE ID FR038 (OU 15)
 EXCEEDANCES ABOVE
 EPA RESIDENTIAL RSL/
 FLORIDA RESIDENTIAL SCTL VALUES
 AREA D


TYNDALL AIR FORCE BASE,
 FLORIDA



Legend	
●	Field Screening/Soil Sampling Location Exceeding Residential RSL/Florida Residential SCTLs
●	Soil Sampling Location
	NON-NTCRA Area
	Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base

Regional Screening Level (RSL) Table (USEPA, April 2012)
 Soil Cleanup Target Level (SCTL) Table (FDEP, April 2005)



Absolute Scale
1:900

Scale In Feet

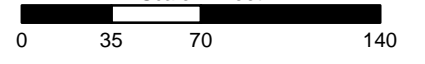



FIGURE 1-12
SITE ID FR038 (OU 15)
EXCEEDANCES ABOVE
**EPA RESIDENTIAL RSL/
 FLORIDA RESIDENTIAL SCTL VALUES**
AREA C

TYNDALL AIR FORCE BASE,
FLORIDA





Legend

- Soil Removal to 0.5 ft.
- Soil Removal to 1.0 ft.
- Soil Removal to 1.5 ft.
- Soil Removal to 2.0 ft.
- Soil Removal to Water Table
- Water Table Contour Line (0.2 ft. interval)
- Development Area
- NON-NTCRA Area
- Current Site FR038 Boundary

Notes:
 NTCRA - Non-Time Critical Removal Action
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base



Absolute Scale
 1:1,200

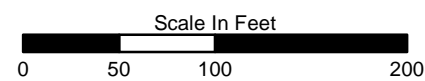


FIGURE 3-1
SITE ID FR038 (OU 15)
INDUSTRIAL REMOVAL AREAS
ALTERNATIVE 2

TYNDALL AIR FORCE BASE,
 FLORIDA





Legend

- Soil Removal to 0.5 ft.
- Soil Removal to 1.0 ft.
- Soil Removal to 1.5 ft.
- Soil Removal to 2.0 ft.
- Soil Removal to 2.5 ft.
- Soil Removal to 3.5 ft.
- Soil Removal to 4.0 ft.
- Soil Removal to Water Table
- Development Area
- Current Site FR038 Boundary

Notes:
 Site information from Tyndall Restoration Group.
 March 2009 Aerial Photography Source:
 Tyndall Air Force Base



Absolute Scale
 1:2,880

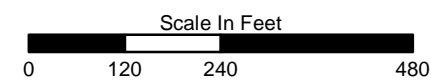


FIGURE 3-2
SITE ID FR038 (OU 15)
RESIDENTIAL REMOVAL AREAS
ALTERNATIVE 3

TYNDALL AIR FORCE BASE,
 FLORIDA



APPENDIX A

**SITE PHOTO LOG
(Provided on CD)**

APPENDIX B

**SOIL BORING LOGS
(Provided on CD)**

APPENDIX C

**ANALYTICAL LABORATORY DATA PACKAGES
(Provided on CD)**

APPENDIX D

DETAILED REMOVAL ACTION ALTERNATIVES COST ESTIMATES

Appendix D-1
Cost Estimate Summary for Alternative 1
No Action/LUCs
ERP Site FR038
Tyndall Air Force Base, Florida

	Unit	Unit Cost	Cost
Total First Year Capital Cost			
Task 01: Continued LUCIP Implementation	1	\$2,700	\$2,700
Total First Year Capital Cost			\$2,700
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Cost	1	\$2,700	\$2,700
Task 01 Years 2 through 30	29 Years	\$2,700	\$50,000
Total Present Value Cost			\$53,000

Assumptions:

Task 01: Includes the following:

- Professional I to perform quarterly site inspections to verify Land Use Controls.
- Sign maintenance/replacement cost per year included.
- Quarterly 2-page Land Use Controls Implementation Status Report and 2 pages of photos.

Appendix D-1
Detailed Cost Estimate for Alternative 1
No Action/LUCs
ERP Site FR038
Tyndall Air Force Base, Florida

Cost Estimate for Alternative 1	0001	Task	01		
Description	LUCIP Implementation				
Labor Category	Units	Hrs	Rate	Cost	
Environmental Engineer - Senior	hr	-	146.94	-	
Project Manager	hr	-	146.94	-	
Program Manager	hr	-	173.88	-	
Professional I	hr	20	78.09	1,561.80	
Professional I	hr	-	64.36	-	
Technician III	hr	-	110.50	-	
CAD/GIS Operator I	hr	-	78.09	-	
Health and Safety Professional - Mid	hr	-	103.02	-	
Senior Clerical	hr	-	88.98	-	
Engineering Technician - Senior	hr	-	92.76	-	
Contract Admin/Procurement - Senior	hr	-	98.02	-	
Total Labor		20		1,561.80	
Field Equipment/Supplies	Unit	Qty	Rate	Cost	
Drinking Water (H&S)	case	2	16.00	32.00	
Ice	bag	4	1.50	6.00	
Total Field Equip/Supplies				38.00	
Travel/Transportation	Unit	Qty	Rate	Cost	
Car Use	day	4	110.00	440.00	
Total Travel/Transportation				440.00	
Other Direct Costs	Unit	Qty	Rate	Cost	
B/W Copies	page	80	0.10	8.00	
Color Copies	page	80	0.90	72.00	
Computer Usage	hour		5.00	-	
Shipping - letter	pkg	20	6.16	123.20	
Binders (1")	each	-	5.00	-	
Total Other Direct Costs				203.20	
Total Non-Labor Costs				681.20	
G & A (on Non-Labor Only)	12.16%			82.83	
Total Labor & Non-Labor				2,325.83	
Subcontractors	Unit	Qty	Rate	Cost	
Sign Maintenance/Replacement	LS	1	250	250.00	
Subtotal Subcontractors				250.00	
Management fee (on subs only)	12.16%			25.00	
Total Subcontractors				275.00	
TOTAL				2,700.00	

Appendix D-2A
Cost Estimate Summary for Alternative 2A
LUCs, Industrial Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Continued LUCIP Implementation	1	\$2,700	\$2,700
Task 02: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 03: On-Site Activities	1	\$3,455,200	\$3,455,200
Task 04: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$3,490,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$3,490,000	\$3,490,000
Task 01 Years 2 through 30	29 Years	\$2,700	\$50,000
Total Present Value Cost			\$3,540,000

Assumptions:

Task 01: Includes the following:

- Professional I to perform quarterly site inspections to verify Land Use Controls.
- Quarterly 2-page Land Use Controls Implementation Status Report.
- Sign maintenance/replacement cost per year included.

Task 02: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 03: Includes the following:

- Transportation and disposal of soil in Subtitle C landfill (See attached detail sheets for additional information).
- Oversight for NTCRA, NTCRA BMP Implementation.
- Assumed duration of on-site activity = 4 weeks.

Task 04: Includes the following:

- Preparation of NTCRA Summary Report.

Appendix D-2A
 Cost Estimate for Alternative 2A
 LUCs, Industrial Soil Removal, Subtitle C Disposal
 ERP Site FR038
 Tyndall Air Force Base, Florida

Cost Estimate for Alternative 2A		0002	Task	01			02			03			04		
Description		LUCIP Implementation			Work Plan/Health and Safety Plan			On-Site Activities			NTCRA Summary Report				
Labor Category	Units	Hrs	Rate	Cost	Hrs	Rate	Cost	Hrs	Rate	Cost	Hrs	Rate	Cost		
Environmental Engineer - Senior	hr	-	146.94	-	24	146.94	3,526.56	-	16	146.94	16	146.94	2,351.04		
Project Manager	hr	-	146.94	-	8	146.94	1,175.52	-	16	146.94	2,351.04	8	146.94	1,175.52	
Program Manager	hr	-	173.88	-	8	173.88	1,391.04	-	-	173.88	-	8	173.88	1,391.04	
Professional I	hr	20	78.09	1,561.80	-	78.09	-	-	-	78.09	-	-	78.09		
Professional I	hr	-	64.36	-	120	64.36	7,723.20	20	64.36	1,287.20	60	64.36	3,861.60		
Technician III	hr	-	110.50	-	-	110.50	-	160	110.50	17,680.00	-	-	110.50		
CAD/GIS Operator I	hr	-	78.09	-	-	78.09	-	-	78.09	-	-	-	78.09		
Health and Safety Professional - Mid	hr	-	103.02	-	20	103.02	2,060.40	-	-	103.02	-	-	103.02		
Senior Clerical	hr	-	88.98	-	8	88.98	711.84	-	-	88.98	-	8	88.98	711.84	
Engineering Technician - Senior	hr	-	92.76	-	-	92.76	-	-	92.76	-	-	-	92.76		
Contract Admin/Procurement - Senior	hr	-	98.02	-	-	98.02	-	-	98.02	-	-	-	98.02		
Total Labor		20		1,561.80	188		16,588.56	196		21,318.24	100		9,491.04		
Field Equipment/Supplies	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
Drinking Water (H&S)	case	2	16.00	32.00	-	16.00	-	10	16.00	160.00	-	-	16.00		
Ice	bag	4	1.50	6.00	-	1.50	-	25	1.50	37.50	-	-	1.50		
Field Supplies & Equipment	ea	-	-	-	-	-	-	1	5,830.00	5,830.00	-	-	300.00		
Total Field Equip/Supplies				38.00						6,027.50					
Travel/Transportation	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
Car Use	day	4	110.00	440.00	-	110.00	-	20	110.00	2,200.00	-	-	110.00		
Total Travel/Transportation				440.00						2,200.00					
Other Direct Costs	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
B/W Copies	page	80	0.10	8.00	1,500	0.10	150.00	-	0.10	-	3,000	0.10	300.00		
Color Copies	page	80	0.90	72.00	150	0.90	135.00	-	0.90	-	180	0.90	162.00		
Computer Usage	hour	-	5.00	-	-	5.00	-	-	5.00	-	-	5.00	-		
Shipping - letter	pkg	20	6.16	123.20	-	6.16	-	-	6.16	-	-	6.16	-		
Shipping - 3lb	pkg	-	15.50	-	5	15.50	77.50	-	15.50	-	15	15.50	232.50		
Shipping - 30lb	pkg	-	36.19	-	-	36.19	-	-	36.19	-	-	36.19	-		
CDs w/case & label	each	-	3.00	-	30	3.00	90.00	-	3.00	-	30	3.00	90.00		
Oversized Prints	each	-	2.00	-	-	2.00	-	-	2.00	-	-	2.00	-		
Binders (1")	each	-	5.00	-	30	5.00	150.00	-	5.00	-	10	5.00	50.00		
Total Other Direct Costs				203.20			602.50						834.50		
Total Non-Labor Costs				681.20			602.50			8,227.50			834.50		
G & A (on Non-Labor Only)	12.16%			82.83			73.26			1,000.46			101.48		
Total Labor & Non-Labor				2,325.83			17,264.32			30,546.20			10,427.02		
Subcontractors	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
Title C Landfill Disposal	LS	-	-	-	-	-	-	1	2,995,142.72	2,995,142.72	-	-	-		
Confirmation Samples	LS	-	-	-	-	-	-	1	118,125.00	118,125.00	-	-	-		
Sign Maintenance/Replacement	LS	1	250.00	250.00	-	-	-	-	-	-	-	-	-		
Subtotal Subcontractors				250.00						3,113,267.72					
Management fee (on subs only)	12.16%			25.00			-			311,326.77			-		
Total Subcontractors				275.00						3,424,594.49					
TOTAL				2,700.00			17,300.00			3,455,200.00			10,500.00		

Appendix D-2A
Cost Estimate for Disposal: Alternative 2A
LUCs, Industrial Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Disposal Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Excavation, Hauling, Disposal				
Dump Truck Haul Rate	trip (30cy)	\$889	461	\$410,104.98
Fuel Surcharge	% (haul rate)	32%	1	\$131,233.59
Disposal Cost	ton	\$98	14411	\$1,412,302.50
Alabama State Tax	ton	\$31	14411	\$446,748.75
ADEM Fee	per profile	\$200	3	\$600.00
CWM Approval Fee	per profile	\$50	3	\$150.00
Disposal/Surcharge Fee	% (disposal)	17.7%	1	\$249,977.54
Excavation	cy	\$5.63	11529	\$64,908.27
Clean Backfill	cy	\$24.21	11529	\$279,117.09
TOTAL COST				\$2,995,142.72

Estimated Volume	11529 cu yd
Volume w/ fluffing factor of 1.2	13835 cu yd
Density	1.25 (silty sand)
Tons Soil	14411 ton
Dump Truck Volume = Fluffed Soil Volume/30 cu yd per dump truck	461 trips

Subtitle C Landfill Facility
Waste Management Emelle Facility
36964 Alabama Hwy 17
Emelle, AL 35459

Appendix D-2A
Cost Estimate for BMP Supplies (Alternative 2A)
LUCs, Industrial Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1	AECOM	MiniRam Dust Monitor	2	\$265.00	\$530.00
2	AECOM	Onsite Lead Analysis Equipment	2	\$2,650.00	\$5,300.00
TOTAL SUPPLIES :					\$5,830.00

Appendix D-2A
Cost Estimate Summary for Confirmation Sampling (Alternatives 2A)
LUCs, Industrial Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1		Sidewall Sampling PAH	550	\$75.00	\$41,250.00
2		Floor Sampling PAH	25	\$75.00	\$1,875.00
TOTAL COST :					\$43,125.00

Appendix D-2B
Cost Estimate Summary for Alternative 2B
LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Continued LUCIP Implementation	1	\$2,700	\$2,700
Task 02: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 03: On-Site Activities	1	\$2,504,200	\$2,504,200
Task 04: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$2,530,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$2,530,000	\$2,530,000
Task 01 Years 2 through 30	29 Years	\$2,700	\$50,000
Total Present Value Cost			\$2,580,000

Assumptions:

Task 01: Includes the following:

- Professional I to perform quarterly site inspections to verify Land Use Controls.
- Sign maintenance/replacement cost per year included.
- Quarterly 2-page Land Use Controls Implementation Status Report.

Task 02: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 03: Includes the following:

- Transportation and disposal of soil in Subtitle D landfill (See attached detail sheets).
- Oversight for NTCRA, NTCRA BMP Implementation.
- Soil Treatment: Mechanical Separation and Stabilization (See attached detail sheets).
- Assumed duration of on-site activity = 5 weeks.

Task 04: Includes the following:

- Preparation of NTCRA Summary Report.

Appendix D-2B
 Cost Estimate for Alternative 2B
 LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
 ERP Site FR038
 Tyndall Air Force Base, Florida

Cost Estimate for Alternative 2B	0002	Task	01			02			03			04		
			LUCIP Implementation			Work Plan/Health and Safety Plan			On-Site Activities			NTCRA Summary Report		
Description			Hrs	Rate	Cost	Hrs	Rate	Cost	Hrs	Rate	Cost	Hrs	Rate	Cost
Labor Category		Units												
Environmental Engineer - Senior		hr	-	146.94	-	24	146.94	3,526.56	-	146.94	-	16	146.94	2,351.04
Project Manager		hr	-	146.94	-	8	146.94	1,175.52	16	146.94	2,351.04	8	146.94	1,175.52
Program Manager		hr	-	173.88	-	8	173.88	1,391.04	-	173.88	-	8	173.88	1,391.04
Professional I		hr	20	78.09	1,561.80	-	78.09	-	-	78.09	-	-	78.09	-
Professional I		hr	-	64.36	-	120	64.36	7,723.20	20	64.36	1,287.20	60	64.36	3,861.60
Technician III		hr	-	110.50	-	-	110.50	-	200	110.50	22,100.00	-	110.50	-
CAD/GIS Operator I		hr	-	78.09	-	-	78.09	-	-	78.09	-	-	78.09	-
Health and Safety Professional - Mid		hr	-	103.02	-	20	103.02	2,060.40	-	103.02	-	-	103.02	-
Senior Clerical		hr	-	88.98	-	8	88.98	711.84	-	88.98	-	8	88.98	711.84
Engineering Technician - Senior		hr	-	92.76	-	-	92.76	-	-	92.76	-	-	92.76	-
Contract Admin/Procurement - Senior		hr	-	98.02	-	-	98.02	-	-	98.02	-	-	98.02	-
Total Labor			20		1,561.80	188		16,588.56	236		25,738.24	100		9,491.04
Field Equipment/Supplies		Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost
Drinking Water (H&S)		case	2	16.00	32.00	-	16.00	-	10	16.00	160.00	-	16.00	-
Ice		bag	4	1.50	6.00	-	1.50	-	25	1.50	37.50	-	1.50	-
Field Supplies & Equipment		ea	-	-	-	-	-	-	1	5,830.00	5,830.00	-	300.00	-
Total Field Equip/Supplies					38.00						6,027.50			
Travel/Transportation		Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost
Car Use		day	4	110.00	440.00	-	110.00	-	25	110.00	2,750.00	-	110.00	-
Total Travel/Transportation					440.00						2,750.00			
Other Direct Costs		Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost
B/W Copies		page	80	0.10	8.00	1,500	0.10	150.00	-	0.10	-	3,000	0.10	300.00
Color Copies		page	80	0.90	72.00	150	0.90	135.00	-	0.90	-	180	0.90	162.00
Computer Usage		hour	-	5.00	-	-	5.00	-	-	5.00	-	-	5.00	-
Shipping - letter		pkg	20	6.16	123.20	-	6.16	-	-	6.16	-	-	6.16	-
Shipping - 3lb		pkg	-	15.50	-	5	15.50	77.50	-	15.50	-	15	15.50	232.50
Shipping - 30lb		pkg	-	36.19	-	-	36.19	-	-	36.19	-	-	36.19	-
CDs w/case & label		each	-	3.00	-	30	3.00	90.00	-	3.00	-	30	3.00	90.00
Oversized Prints		each	-	2.00	-	-	2.00	-	-	2.00	-	-	2.00	-
Binders (1")		each	-	5.00	-	30	5.00	150.00	-	5.00	-	10	5.00	50.00
Total Other Direct Costs					203.20			602.50						834.50
Total Non-Labor Costs					681.20			602.50			8,777.50			834.50
G & A (on Non-Labor Only)		12.16%			82.83			73.26			1,067.34			101.48
Total Labor & Non-Labor					2,325.83			17,264.32			35,583.08			10,427.02
Subcontractors		Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost
Mt2 (excavation, sifting, etc)		LS	-	-	-	-	-	-	1	1,022,558.60	1,022,558.60	-	-	-
Title D Landfill Disposal		LS	-	-	-	-	-	-	1	1,103,474.80	1,103,474.80	-	-	-
Sign Maintenance/Repair		LS	1	250.00	250.00	-	-	-	-	-	-	-	-	-
Confirmation Sampling		LS	-	-	-	-	-	-	1	118,125.00	118,125.00	-	-	-
Subtotal Subcontractors					250.00						2,244,158.40			
Management fee (on subs only)		12.16%			25.00						224,415.84			
Total Subcontractors					275.00						2,468,574.24			
TOTAL					2,700.00			17,300.00			2,504,200.00			10,500.00

Appendix D-2B
Cost Estimate for Treatment: Alternative 2B
LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Treatment Subcontractor Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Excavation, Sifting, Stabilization, Prep for Disposal				
Treatability Study	ls	\$500	1	\$500.00
Work Plans/Safety Plans/Mobe/Setup/Breakdown/Demob	ls	\$15,000	1	\$15,000.00
Excavation with Heavy Equipment	cy	\$5	10500	\$52,500.00
Excavation with Vacuum Rig	cy	\$13	1029	\$13,377.00
Enhanced Screening for Lead Recovery	cy	\$24	13835	\$332,035.20
Lead Recycling Value to Customer	lb	\$0	0	\$0.00
Hand Raking/Soil Pick-up (1 crew @ 1 acre per day)	acre	\$7,125	2	\$14,250.00
Ecobond Stabilization Treatment to <5.0 mg/L Pb TCLP	cy	\$38	13835	\$525,722.40
Loading	cy	\$5	13835	\$69,174.00
TOTAL COST				\$1,022,558.60

Estimated Volume For Excavation	10500 cu yd
Estimated Volume For Vacuum Rig	1029 cu yd
Total Excavated Volume Removed	11529 cu yd
Estimated total volume with fluffing factor of 1.2	13835 cu yd

Appendix D-2B
Cost Estimate for Disposal: Alternative 2B
LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Disposal Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Hauling and Disposal				
Pre & Post Construction Activities	ls	\$6,700.00	1	\$6,700.00
Mob and Site Prep	ls	\$45,029.00	1	\$45,029.00
Loading, Transport, Disposal	ton	\$50.38	15132	\$762,340.71
Backfill	cy	\$24.21	11529	\$279,117.09
Site Teardown and Demob	ls	\$10,288.00	1	\$10,288.00
TOTAL COST				\$1,103,474.80

Estimated Volume	11529 cu yd
Density	1.25 (silty sand)
Bulking Due to Treatment	5%
Tons soil	15132 ton

Subtitle D Landfill Facility
 WM of Pasco County
 13022 Hays Rd
 Springhill, FL 34610

Appendix D-2B
Cost Estimate for BMP Supplies (Alternative 2B)
LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1	AECOM	MiniRam Dust Monitor	2	\$265.00	\$530.00
2	AECOM	Onsite Lead Analysis Equipment	2	\$2,650.00	\$5,300.00
TOTAL SUPPLIES :					\$5,830.00

Appendix D-2B
Cost Estimate Summary for Confirmation Sampling (Alternatives 2B)
LUCs, Industrial Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1		Sidewall Sampling PAH	550	\$75.00	\$41,250.00
2		Floor Sampling PAH	25	\$75.00	\$1,875.00
TOTAL COST :					\$43,125.00

Appendix D-3A
Cost Estimate Summary for Alternative 3A
Residential Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 02: On-Site Activities	1	\$7,683,000	\$7,683,000
Task 03: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$7,710,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$7,710,000	\$7,710,000
Total Present Value Cost			\$7,710,000

Assumptions:

Task 01: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 02: Includes the following:

- Transportation and disposal of soil in Subtitle C landfill (See attached detail sheets).
- Oversight for NTCRA, NTCRA removal action BMP Implementation.
- Assumed duration of on-site activity = 5 weeks.

Task 03: Includes the following:

- Preparation of NTCRA Summary Report.

Appendix D-3A
 Cost Estimate for Alternative 3A
 Residential Soil Removal, Subtitle C Disposal
 ERP Site FR038
 Tyndall Air Force Base, Florida

Cost Estimate for Alternative 3A	0003	Task	01			02			03		
			Work Plan/Health and Safety Plan			On-Site Activities			NTCRA Summary Report		
Description											
Labor Category	Units	Hrs	Rate	Cost	Hrs	Rate	Cost	Hrs	Rate	Cost	
Environmental Engineer - Senior	hr	24	146.94	3,526.56	-	146.94	-	16	146.94	2,351.04	
Project Manager	hr	8	146.94	1,175.52	16	146.94	2,351.04	8	146.94	1,175.52	
Program Manager	hr	8	173.88	1,391.04	-	173.88	-	8	173.88	1,391.04	
Professional I	hr	-	78.09	-	-	78.09	-	-	78.09	-	
Professional I	hr	120	64.36	7,723.20	20	64.36	1,287.20	60	64.36	3,861.60	
Technician III	hr	-	110.50	-	200	110.50	22,100.00	-	110.50	-	
CAD/GIS Operator I	hr	-	78.09	-	-	78.09	-	-	78.09	-	
Health and Safety Professional - Mid	hr	20	103.02	2,060.40	-	103.02	-	-	103.02	-	
Senior Clerical	hr	8	88.98	711.84	-	88.98	-	8	88.98	711.84	
Engineering Technician - Senior	hr	-	92.76	-	-	92.76	-	-	92.76	-	
Contract Admin/Procurement - Senior	hr	-	98.02	-	-	98.02	-	-	98.02	-	
Total Labor		188		16,588.56	236		25,738.24	100		9,491.04	
Field Equipment/Supplies	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	
Drinking Water (H&S)	case	-	16.00	-	10	16.00	160.00	-	16.00	-	
Ice	bag	-	1.50	-	25	1.50	37.50	-	1.50	-	
Field Supplies & Equipment	ea	-	-	-	1	5,830.00	5,830.00	-	300.00	-	
Total Field Equip/Supplies							6,027.50				
Travel/Transportation	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	
Car Use	day	-	110.00	-	25	110.00	2,750.00	-	110.00	-	
Total Travel/Transportation							2,750.00				
Other Direct Costs	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	
B/W Copies	page	1,500	0.10	150.00	-	0.10	-	3,000	0.10	300.00	
Color Copies	page	150	0.90	135.00	-	0.90	-	180	0.90	162.00	
Computer Usage	hour	-	5.00	-	-	5.00	-	-	5.00	-	
Shipping - letter	pkg	-	6.16	-	-	6.16	-	-	6.16	-	
Shipping - 3lb	pkg	5	15.50	77.50	-	15.50	-	15	15.50	232.50	
Shipping - 30lb	pkg	-	36.19	-	-	36.19	-	-	36.19	-	
CDs w/case & label	each	30	3.00	90.00	-	3.00	-	30	3.00	90.00	
Oversized Prints	each	-	2.00	-	-	2.00	-	-	2.00	-	
Binders (1")	each	30	5.00	150.00	-	5.00	-	10	5.00	50.00	
Total Other Direct Costs				602.50						834.50	
Total Non-Labor Costs				602.50			8,777.50			834.50	
G & A (on Non-Labor Only)	12.16%			73.26			1,067.34			101.48	
Total Labor & Non-Labor				17,264.32			35,583.08			10,427.02	
Subcontractors	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost	
Title C Landfill Disposal	LS	-	-	-	1	6,668,461.85	6,668,461.85	-	-	-	
Demolition of Parking Lot & Expansion	LS	-	-	-	1	47,462.00	47,462.00	-	-	-	
Sign Maintenance/Repair	LS	-	-	-	-	-	-	-	-	-	
Confirmation Samples	LS	-	-	-	2	118,125.00	236,250.00	-	-	-	
Subtotal Subcontractors							6,952,173.85				
Management fee (on subs only)	12.16%						695,217.39				
Total Subcontractors							7,647,391.24				
TOTAL				17,300.00			7,683,000.00			10,500.00	

Appendix D-3A
Cost Estimate for Disposal: Alternative 3A
Residential Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Disposal Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Excavation, Hauling, Disposal				
Dump Truck Haul Rate	per trip (30 cu yd)	\$889	1027	\$913,194.12
Fuel Surcharge	% (haul rate)	32%	1	\$292,222.12
Disposal Cost	ton	\$98	32090	\$3,144,820.00
Alabama State Tax	ton	\$31	32090	\$994,790.00
ADEM Fee	per profile	\$200	3	\$600.00
CWM Approval Fee	per profile	\$50	3	\$150.00
Disposal/Surcharge Fee	% (disposal)	17.7%	1	\$556,633.14
Excavation	cy	\$5.63	25672	\$144,533.36
Clean Backfill	cy	\$24.21	25672	\$621,519.12
TOTAL COST				\$6,668,461.85

Estimated Volume	25672 cu yd
Volume w/ fluffing factor of 1.2	30806 cu yd
Density	1.25 (silty sand)
Tons Soil	32090 tons

Subtitle C Landfill Facility
Waste Management Emelle Facility
36964 Alabama Hwy 17
Emelle, AL 35459

Appendix D-3A
Cost Estimate for Demolition: Alternative 3A
Residential Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Demolition Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Pavement Removal	SY	\$4.81	2600	\$12,506.00
Building Demolition - Education Bldg. Addition	CF (standing)	\$0.42	76800	\$32,256.00
Foundations & Footings Demolition	LF	\$18	150	\$2,700.00
TOTAL COST				\$47,462.00

Notes: Education Bldg addition to be single story w/ 150 LF of footings

Appendix D-3A
Cost Estimate for BMP Supplies (Alternative 3A)
Residential Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1	AECOM	MiniRam Dust Monitor	2	\$265.00	\$530.00
2	AECOM	Onsite Lead Analysis Equipment	2	\$2,650.00	\$5,300.00
TOTAL SUPPLIES :					\$5,830.00

Appendix D-3A
Cost Estimate Summary for Confirmation Sampling (Alternatives 3A)
Residential Soil Removal, Subtitle C Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1		Sidewall Sampling PAH	1500	\$75.00	\$112,500.00
2		Floor Sampling PAH	75	\$75.00	\$5,625.00
TOTAL COST :					\$118,125.00

Appendix D-3B
Cost Estimate Summary for Alternative 3B
Residential Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Work Plan/Health and Safety Plan	1	\$17,300	\$17,300
Task 02: On-Site Activities	1	\$5,447,700	\$5,447,700
Task 03: NTCRA Summary Report	1	\$10,500	\$10,500
Total First Year Capital Cost			\$5,480,000
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	3%		
Total First Year Capital Cost	1 Year	\$5,480,000	\$5,480,000
Total Present Value Cost			\$5,480,000

Assumptions:

Task 01: Includes the following:

- Development of the Health and Safety Plan for Removal Action.
- Development of the Work Plan for Removal Action.

Task 02: Includes the following:

- Transportation and disposal of soil in Subtitle D landfill (See attached detail sheets).
- Oversight for NTCRA, NTCRA BMP Implementation.
- Soil Treatment: Mechanical Separation and Stabilization (See attached detail sheets).
- Assumed duration of on-site activity = 6 weeks.

Task 03: Includes the following:

- Preparation of NTCRA Summary Report.

Appendix D-3B
 Cost Estimate for Alternative 3B
 Residential Soil Removal, Treatment, Subtitle D Disposal
 ERP Site FR038
 Tyndall Air Force Base, Florida

Cost Estimate for Alternative 3B		0003	Task	01			02			03		
Description		Work Plan/Health and Safety Plan			On-Site Activities			NTCRA Summary Report				
Labor Category	Units	Hrs	Rate	Cost	Hrs	Rate	Cost	Hrs	Rate	Cost		
Environmental Engineer - Senior	hr	24	146.94	3,526.56	-	146.94	-	16	146.94	2,351.04		
Project Manager	hr	8	146.94	1,175.52	16	146.94	2,351.04	8	146.94	1,175.52		
Program Manager	hr	8	173.88	1,391.04	-	173.88	-	8	173.88	1,391.04		
Professional I	hr	-	78.09	-	-	78.09	-	-	78.09	-		
Professional I	hr	120	64.36	7,723.20	20	64.36	1,287.20	60	64.36	3,861.60		
Technician III	hr	-	110.50	-	240	110.50	26,520.00	-	110.50	-		
CAD/GIS Operator I	hr	-	78.09	-	-	78.09	-	-	78.09	-		
Health and Safety Professional - Mid	hr	20	103.02	2,060.40	-	103.02	-	-	103.02	-		
Senior Clerical	hr	8	88.98	711.84	-	88.98	-	8	88.98	711.84		
Engineering Technician - Senior	hr	-	92.76	-	-	92.76	-	-	92.76	-		
Contract Admin/Procurement - Senior	hr	-	98.02	-	-	98.02	-	-	98.02	-		
Total Labor		188		16,588.56	276		30,158.24	100		9,491.04		
Field Equipment/Supplies	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
Drinking Water (H&S)	case	-	16.00	-	15	16.00	240.00	-	16.00	-		
Ice	bag	-	1.50	-	30	1.50	45.00	-	1.50	-		
Field Supplies & Equipment	ea	-	5,830.00	-	1	5,830.00	5,830.00	-	300.00	-		
Total Field Equip/Supplies							6,115.00					
Travel/Transportation	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
Car Use	day	-	110.00	-	30	110.00	3,300.00	-	110.00	-		
Total Travel/Transportation							3,300.00					
Other Direct Costs	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
B/W Copies	page	1,500	0.10	150.00	-	0.10	-	3,000	0.10	300.00		
Color Copies	page	150	0.90	135.00	-	0.90	-	180	0.90	162.00		
Computer Usage	hour	-	5.00	-	-	5.00	-	-	5.00	-		
Shipping - letter	pkg	-	6.16	-	-	6.16	-	-	6.16	-		
Shipping - 3lb	pkg	5	15.50	77.50	-	15.50	-	15	15.50	232.50		
Shipping - 30lb	pkg	-	36.19	-	-	36.19	-	-	36.19	-		
CDs w/case & label	each	30	3.00	90.00	-	3.00	-	30	3.00	90.00		
Oversized Prints	each	-	2.00	-	-	2.00	-	-	2.00	-		
Binders (1")	each	30	5.00	150.00	-	5.00	-	10	5.00	50.00		
Total Other Direct Costs				602.50						834.50		
Total Non-Labor Costs				602.50			9,415.00			834.50		
G & A (on Non-Labor Only)	12.16%			73.26			1,144.86			101.48		
Total Labor & Non-Labor				17,264.32			40,718.10			10,427.02		
Subcontractors	Unit	Qty	Rate	Cost	Qty	Rate	Cost	Qty	Rate	Cost		
MT2 (excavation, sifting, etc)	LS	-	-	-	1	2,250,639.80	2,250,639.80	-	-	-		
Title D Landfill Disposal	LS	-	-	-	1	2,381,065.03	2,381,065.03	-	-	-		
Demolition of Parking Lot and Expansion	LS	-	-	-	1	47,462.00	47,462.00	-	-	-		
Sign Maintenance and Repair	LS	-	-	-	-	-	-	-	-	-		
Confirmation Samples	LS	-	-	-	2	118,125.00	236,250.00	-	-	-		
Subtotal Subcontractors							4,915,416.83					
Management fee (on subs only)	12.16%			-			491,541.68			-		
Total Subcontractors							5,406,958.51					
TOTAL				17,300.00			5,447,700.00			10,500.00		

Appendix D-3B
Cost Estimate for Treatment: Alternative 3B
Residential Soil Removal, Treatment, Subtitle D Disposal
FRP Site FR038
Tyndall Air Force Base, Florida

Treatment Subcontractor Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Excavation, Sifting, Stabilization, Prep for Disposal				
Treatability Study	ls	\$500	1	\$500.00
Work Plans/Safety Plans/Mobe/Setup/Breakdown/Demob	ls	\$15,000	1	\$15,000.00
Excavation with Heavy Equipment	cy	\$5	23000	\$115,000.00
Excavation with Vacuum Rig	cy	\$13	2672	\$34,736.00
Enhanced Screening for Lead Recovery	cy	\$24	30806	\$739,353.60
Lead Recycling Value to Customer	lb	\$0	0	\$0.00
Hand Raking/Soil Pick-up (1 crew @ 1 acre per day)	acre	\$7,125	3	\$21,375.00
Ecobond Stabilization Treatment to <5.0 mg/L Pb TCLP	cy	\$38	30806	\$1,170,643.20
Loading	cy	\$5	30806	\$154,032.00
TOTAL COST				\$2,250,639.80

Estimated Volume for Excavation	23000 cu yd
Estimated Volume for Vacuum Rig	2672 cu yd
Volume w/ fluffing factor of 1.2	30806 cu yd

Appendix D-3B
Cost Estimate for Disposal: Alternative 3B
Residential Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Disposal Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Hauling and Disposal				
Pre & Post Construction Activities	ls	\$6,700.00	1	\$6,700.00
Mob and Site Prep	ls	\$45,029.00	1	\$45,029.00
Loading, Transport, Disposal	ton	\$50.38	33695	\$1,697,528.91
Clean Backfill	cy	\$24.21	25672	\$621,519.12
Site Teardown and Demob	ls	\$10,288.00	1	\$10,288.00
TOTAL COST				\$2,381,065.03

Estimated Volume for Disposal	25672 cu yd
Soil Density	1.25 (silty sand)
Bulking Due to Treatment	5%
Tons of Soil	33695 tons

Subtitle D Landfill Facility
 WM of Pasco County
 13022 Hays Rd
 Springhill, FL 34610

Appendix D-3B
Cost Estimate for Demolition: Alternative 3B
Residential Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

Demolition Costs

Description	Unit	Unit Cost	Quantity	Extended Cost
Pavement Removal	SY	\$4.81	2600	\$12,506.00
Building Demolition - Education Bldg. Addition	CF (standing)	\$0.42	76800	\$32,256.00
Foundations & Footings Demolition	LF	\$18	150	\$2,700.00
TOTAL COST				\$47,462.00

Notes: Education Bldg addition to be single story w/ 150 LF of footings

Appendix D-3B
Cost Estimate for BMP Supplies (Alternatives 3B)
Residential Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1	AECOM	MiniRam Dust Monitor	2	\$265.00	\$530.00
2	AECOM	Onsite Lead Analysis Equipment	2	\$2,650.00	\$5,300.00
TOTAL SUPPLIES :					\$5,830.00

Appendix D-3B
Cost Estimate Summary for Confirmation Sampling (Alternatives 3B)
Residential Soil Removal, Treatment, Subtitle D Disposal
ERP Site FR038
Tyndall Air Force Base, Florida

#	VENDOR	DESCRIPTION	QTY	\$ EA.	TOTAL
1		Sidewall Sampling PAH	1500	\$75.00	\$112,500.00
2		Floor Sampling PAH	75	\$75.00	\$5,625.00
TOTAL COST :					\$118,125.00

APPENDIX E

DOCUMENT AMENDMENT HISTORY

APPENDIX E
Document Amendment History Summary
Draft Final EE/CA - ERP Site ID FR038
Beacon Beach Skeet Range (OU 15)
Tyndall Air Force Base, Florida

Date	Section	Page #	Correspondence/Modifications	Modification Rationale
2/18/2013			FDEP Approval of draft EE/CA, revision 0.	
			The following modifications were made to the 21 DEC 2012 draft EE/CA for Site ID FR038 to transition the document from revision 0 to revision 1. Incidental modifications, such as changes to revision numbers, dates, and formatting, were made throughout the document but have not been tracked independently.	
2/20/2013	Appendix D	Multiple	Cost estimates were added to Alternatives 3A and 3B to include demolition costs previously omitted.	The total cost estimates for Alternative 3A and 3B increased by a marginal amount. (<1% change)
3/6/2013	1	1-6 & 1-7	Paragraph added to Current Occurance, Nature and Extent of Contamination.	Paragraph added to clarify which screening limits were used for each of the contaminants, and how these limits were chosen.
3/6/2013	3	Multiple	Paragraph added to the description of Alternatives 2 and 3	Paragraph added to clarify disposal methods including the lead shot and clay pidgeon debris.
3/6/2013	Appendices		Appendix E, Document Amendment History was added.	Appendix was added to support the incorporation of FDEP correspondance into the draft final EE/CA, revision 1.
3/6/2013	Executive Summary	ES-3	A paragraph was added to the bottom of the Executive Summary.	Paragraph added to document that EPA Region 4 and FDEP were provided the opportunity to review the draft EE/CA and subsequent regulatory review correspondance.



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

February 18, 2013

Mr. Carl J. Lanz
325th CES/CEV
119 Alabama Avenue
Tyndall Air Force Base
Panama City, Florida 32403-5014

RE: Draft Engineering Evaluation/Cost Analysis for Proposed Non-Time Critical Removal Action, Site FR038, Beacon Beach Skeet Range (OU 15), Revision 0, Tyndall Air Force Base, Florida

RE: Dear Mr. Lanz:

The Department completed a review of the Draft Engineering Evaluation/Cost Analysis for Proposed Non-Time Critical Removal Action, Site FR038, Beacon Beach Skeet Range (OU 15), revision 0, dated December 2012 (received December 26, 2012) and find the document to be adequate for its intent and approved.

If I can be of any further assistance with this matter, please contact me at (850) 245-8998.

Sincerely,

A handwritten signature in black ink that reads "Tracie L. Bolanos". The signature is fluid and includes a long horizontal flourish at the end.

Tracie L. Bolanos
Remedial Project Manager

KAW Handwritten initials "KAW" in blue ink, written over the printed name "KAW".

cc Julie Corkran, USEPA Region 4, Atlanta Georgia