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NAS CECIL FIELD, FL  
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TECHNICAL MEMORANDUM ON SOIL REMEDIATION FOR OPERABLE UNIT 3 (OU 3) SITE  
8 NAS CECIL FIELD FL  
12/14/1998  
TETRA TECH NUS INC

**Technical Memorandum**  
**Soil Remediation**  
for  
**Operable Unit 3, Site 8**

**Naval Air Station Cecil Field**  
**Jacksonville, Florida**



**Southern Division**  
**Naval Facilities Engineering Command**  
**Contract Number N62467-94-D-0888**  
**Contract Task Order 0039**

December 1998

CERTIFICATION OF TECHNICAL  
DATA CONFORMITY (MAY 1987)

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

DATE: December 14, 1998

NAME AND TITLE OF CERTIFYING OFFICIAL: Mark Speranza, P.E.  
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Debbie Wroblewski  
Program Manager

## 1.0 INTRODUCTION

This Technical Memorandum for soil remediation at Naval Air Station (NAS) Cecil Field, Operable Unit (OU) 3, Site 8 has been prepared for the Southern Division (SOUTHDIV) Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0039. The Base Realignment and Closure Team (BCT) has elected to remediate total recoverable petroleum hydrocarbon (TRPH) contaminated soil at OU3, Site 8 through excavation and off-site disposal. The purpose of this Technical Memorandum is to provide the rationale for the selection of the clean-up criterion used to delineate the extent of excavation for TRPH contaminated soil at OU3, Site 8.

This Technical Memorandum is divided into four sections. Section 1.0 provides this brief introduction. Section 2.0 summarizes site background information, the Remedial Investigation (RI), and the Remedial Action Objective. Section 3.0 describes the selected remedial action, including delineation of the excavation limits, excavation and offsite transportation and disposal, and confirmatory sampling. Section 4.0 presents the rationale for the selection of the clean-up criterion used to delineate the extent of excavation.

## **2.0 SITE BACKGROUND**

### **2.1 LOCATION, DESCRIPTION, AND HISTORY**

OU3, Site 8, Boresite Range, Hazardous Waste Storage Area, and Firefighting Area, is located approximately 1,600 feet south of the east-and-west flightline, 3,500 feet west of the north-and-south flightline, 700 feet north of Perimeter Road, and 1,000 feet north of Sal Taylor Creek.

The main features of OU3, Site 8 are a taxiway which extends from the east-and-west flightline, a concrete pad at the end of that taxiway, the boresite backstop 600 feet southwest of the concrete pad, the open field between the concrete pad and the backstop, and an access road. The areas north and northwest of the site are open, grassy fields. The areas southwest, south, and east of the site are planted with pine trees. Drainage ditches are located on either side of the boresite range.

From 1970 to 1988, OU3, Site 8 was used as a boresite testing area for aircraft gunnery. Aircraft would taxi to the concrete pad and "sight in" their guns by firing at targets in front of the backstop.

From 1975 to 1988, OU3, Site 8 was also used as a firefighting training area. Training activities took place in three bermed, unlined pits. Two pits were located adjacent to and northwest of the concrete pad. One pit was adjacent to and southwest of the concrete pad. As part of training, aircraft frames were placed in the pits, doused with flammable liquids, ignited, and extinguished.

From the late 1970's to 1980, OU3, Site 8 was used for the storage of drummed hazardous wastes. Drums were stored in the southern part of the open field between the concrete pad and the boresite backstop. Reportedly, some of the drums were shot through and their contents spilled onto the ground.

Currently, OU3, Site 8 is used for loading ordnance onto aircraft. Loading activities take place on the taxiway.

### **2.2 INVESTIGATION HISTORY**

In the fall of 1994, one hundred and thirty-six surface soil screening samples (CEF-08-SS-001 through CEF-08-SS-136) were collected from 0 to 1 foot below ground surface (bgs) as part of the RI (ABB-ES, August 1997). Screening locations were selected based on the backstop location, the approximate locations of the firefighting training areas, the hazardous waste storage area, and the ongoing results of site screening activities. Sample locations were generally located on a grid pattern across the site.

Samples were analyzed for polynuclear aromatic hydrocarbons (PAHs), TRPH, and lead. Samples were analyzed for different constituents at different locations depending upon the location and purpose of the sample.

Based on the RI field screening results, 35 confirmatory surface soil samples (CF8SS1 through CF8SS35) were collected to verify the findings of the RI screening. Surface soil samples were collected between 0 to 1 foot bgs during February and October 1995 as part of the RI. Twenty three samples (CF8SS1 through CF8SS23) were analyzed for target compound list (TCL) organics, target analyte list (TAL) inorganics, and TRPH. Twelve samples (CF8SS24 through CF8SS35) were analyzed for TRPH only (ABB-ES, August 1997).

In August 1998, 24 additional samples were collected and analyzed for TRPH by Tetra Tech NUS, Inc. (TtNUS) to further delineate the extent of surface soil contamination at OU3, Site 8. These samples were obtained to refine and finalize the excavation limits. Surface soil samples (CEF-08-SS-036 through CEF-08-SS-059) were collected between 0 to 1 foot bgs (TtNUS, November 1998).

All sampling locations are shown on Figure 2-1.

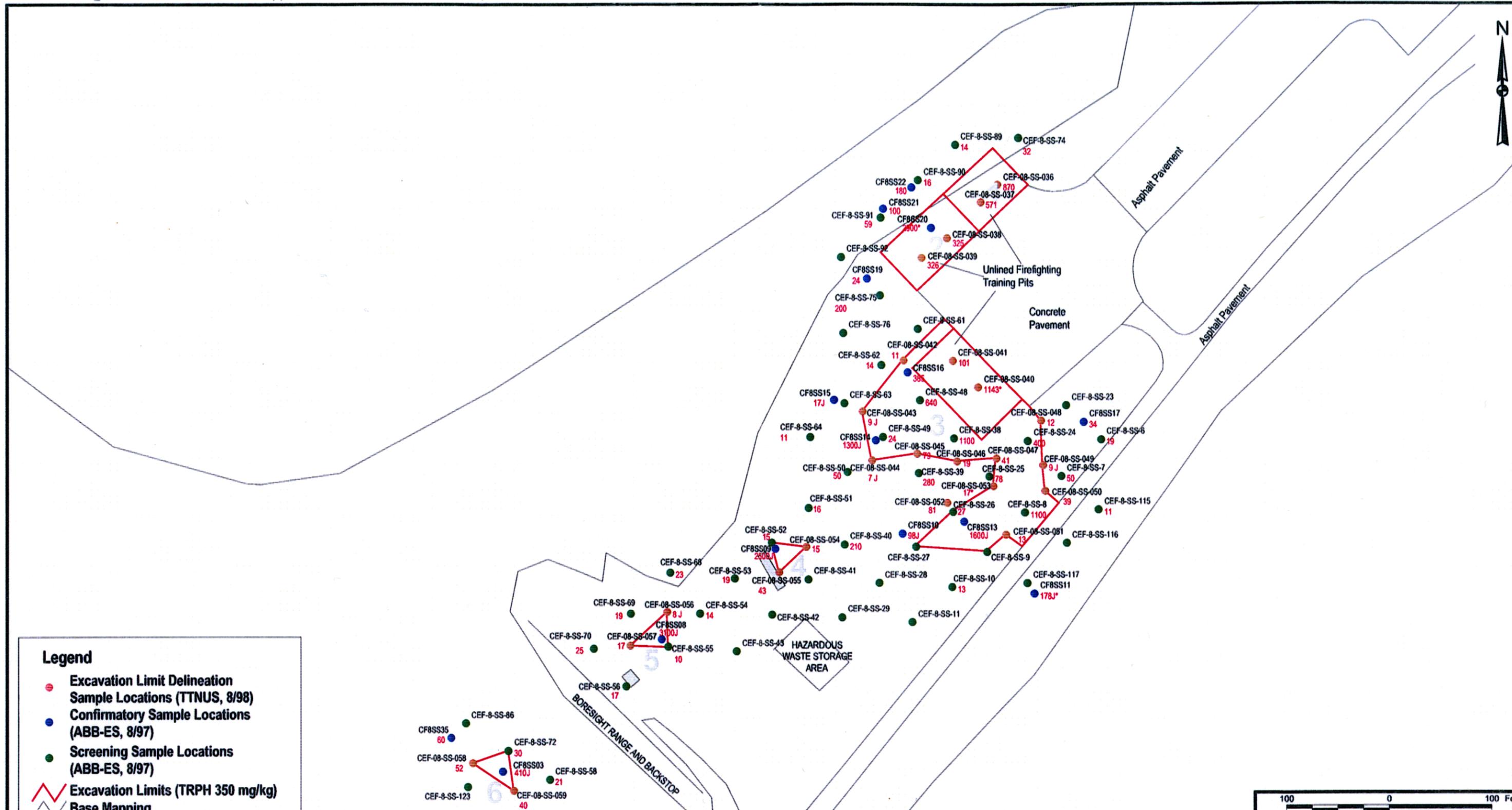
### **2.3 REMEDIAL ACTION OBJECTIVE**

The remedial action at OU3, Site 8 will consist of the removal of soils contaminated with TRPH concentrations which exceed the Florida Brownfields Cleanup Criteria Rule of 350 mg/kg (F.A.C. 62-785). Remediation will consist of excavation of TRPH contaminated soil to a depth of one foot below ground surface and to one foot below the ground water elevation in the former pit areas. The residential-based cleanup goal was chosen to eliminate requirements for providing institutional controls for site soil after site closure. In summary, the Remedial Action Objective (RAO) for contaminated soil at OU3, Site 8 is as follows:

- Reduce human health risk associated with residential exposure to soil containing TRPH concentrations in excess of 350 mg/kg, as established in the State of Florida Brownfields Cleanup Criteria Rule.

Using screening, confirmatory, and delineation analytical data from the RI and subsequent field efforts, excavation limits were established which encompass soil with a TRPH concentration that exceeds this criterion. The areal extent of excavation is shown on Figure 2-1. On that basis and assuming a depth of excavation of one foot below ground surface (bgs) in all areas except in the pit areas, where soil will be

excavated to one foot below the groundwater table, the total volume of excavated soil is estimated at 2,215 cubic yards (yd<sup>3</sup>).



**Legend**

- Excavation Limit Delineation Sample Locations (TTNUS, 8/98)
- Confirmatory Sample Locations (ABB-ES, 8/97)
- Screening Sample Locations (ABB-ES, 8/97)
- ▭ Excavation Limits (TRPH 350 mg/kg) Base Mapping

TRPH: Total Recoverable Petroleum Hydrocarbons  
 \* Average of sample and duplicate  
 Note: Not all non-detected sample locations have been identified on this map. Only sample locations used to delineate removal area have been shown.



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1" = 100'	



**SAMPLE LOCATIONS AND EXCAVATION LIMITS**  
 OPERABLE UNIT 3, SITE 8  
 NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA

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### 3.0 REMEDIAL ACTION DESCRIPTION

#### 3.1 OVERVIEW

The remedial action for soil to be conducted at OU3, Site 8 includes the following elements:

- Identification of the remedial action limits using marked sample locations and field survey, as required.
- Sampling and analysis of soil for disposal characterization
- Excavation of approximately 2,215 yd<sup>3</sup> of TRPH contaminated soil which exceeds the State of Florida Brownfields Cleanup Criteria Rule for residential use.
- Collection and analysis of confirmation samples to verify that contaminated soil has been removed.
- Offsite transportation and disposal of excavated soil.
- Backfilling of excavated areas with clean fill.
- Grading of excavated areas and site restoration with topsoil, seed, and mulch.

Estimated volumes of excavated soil are summarized below on an area by area basis.

<u>Area</u>	<u>Volume (yd<sup>3</sup>)</u>
1	361
2	470
3	1,317
4	18
5	23
6	<u>26</u>
<b>TOTAL</b>	<b>2,215</b>

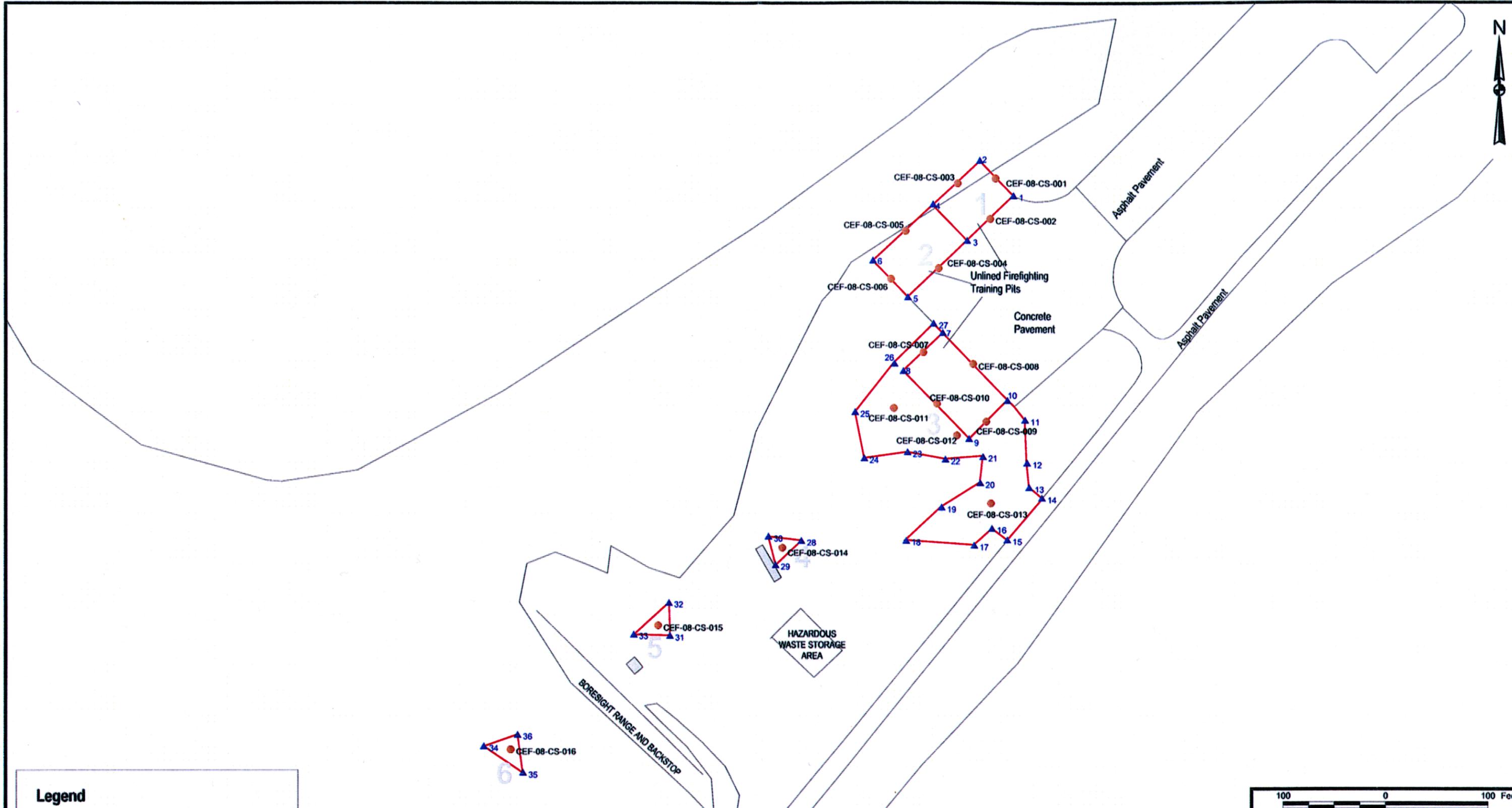
The soil to be excavated contains a maximum TRPH concentration of 3,100 mg/kg; therefore, it is anticipated that it will be non-hazardous.

#### 3.2 SEQUENCE OF OPERATIONS

The remedial action will be conducted in the following sequence:

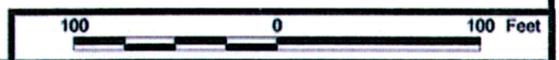
1. An offsite disposal facility permitted to accept the excavated soil will be identified. The waste profiling and acceptance testing requirements of this facility will be determined and, as required, soil characterization sample(s) will be collected and analyzed; if needed.
2. Underground utilities and other obstacles located in and near the areas to be excavated will be identified.

3. Excavation limits and confirmatory sample locations will be established using existing flagging and field survey, as required. Anticipated excavation limits are shown on Figure 3-1, and survey data for the points defining these limits are listed on Table 3-1.
4. Erosion and sediment controls, such as silt fence, will be constructed in areas downgradient of excavation areas prior to any earth disturbance activities.
5. The areas to be excavated will be cleared and grubbed as necessary.
6. Soil will be excavated within the pre-determined boundaries as follows:
  - 6.1 In the pit areas, soil will be excavated to one foot below the groundwater elevation. Additional excavation will be performed if field observations (such as visible staining or elevated PID/FID readings) indicate residual contamination. It is anticipated that excavation in the pit areas will generally extend to a depth of 3 to 3.5 feet bgs.
  - 6.2 In the remaining areas, soil will be excavated to a depth of one foot bgs. Additional excavation will be performed if field observations indicate residual contamination.
7. Excavated soil will be handled as follows:
  - 7.1 If the offsite disposal facility accepts pre-excavation analytical test results, excavated soil will be directly loaded into trucks and transported for offsite disposal.
  - 7.2 If the offsite disposal facility requires analytical test results from post-excavation composite sample(s), the excavated soil will be stockpiled, sampled, and analyzed as required. After the approved results has been received from the disposal facility, the stockpiled soil will be loaded into trucks and transported to the disposal facility. Stockpiled soil will be stored on, and covered with, plastic sheeting.
8. Confirmation sampling will be performed. Confirmation sampling locations are shown on Figure 3-1. Location, depth, survey data, and analytical parameter for confirmation samples are summarized on Table 3-2. If analytical results for any of the confirmation samples indicate a TRPH concentration of 350 mg/kg or more, additional soil will be excavated as follows:



**Legend**

- ▲ Excavation Limit Points
- Proposed Confirmatory Sample Locations
- ▬ Excavation Limits (TRPH 350 mg/kg)
- ▭ Base Mapping



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**EXCAVATION LIMITS  
AND CONFIRMATORY SAMPLE LOCATIONS**  
OPERABLE UNIT 3, SITE 8  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA

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**TABLE 3-1**  
**EXCAVATION LIMITS DATA**  
**OPERABLE UNIT 3, SITE 8**  
**NAVAL AIR STATION CECIL FIELD**  
**JACKSONVILLE, FLORIDA**

Area	Excavation Limit Point	Corresponding Delineation Sample ID	Northing	Easting
1	1	NA	2138052.42	375318.70
1	2	NA	2138087.79	375284.27
1,2	3	NA	2138007.41	375271.46
1,2	4	NA	2138043.87	375235.98
2	5	NA	2137950.46	375210.28
2	6	NA	2137987.42	375174.30
3	7	NA	2137913.90	375245.75
3	8	NA	2137875.39	375205.47
3	9	NA	2137806.22	375273.12
3	10	NA	2137845.24	375312.64
3	11	CEF-08-SS-048	2137824.84	375330.45
3	12	CEF-08-SS-049	2137781.28	375332.43
3	13	CEF-08-SS--050	2137756.33	375334.56
3	14	NA	2137745.31	375347.52
3	15	NA	2137702.86	375312.27
3	16	NA	2137714.66	375296.34
3	17	CEF-8-SS-9	2137697.25	375278.25
3	18	CEF-8-SS-27	2137701.98	375208.09
3	19	CEF-8-SS-26	2137736.12	375244.37
3	20	CEF-08-SS-053	2137761.04	375284.43
3	21	CEF-08-SS-047	2137788.13	375287.37
3	22	CEF-08-SS-046	2137785.23	375248.44
3	23	CEF-08-SS-045	2137792.53	375209.34
3	24	CEF-08-SS-044	2137786.26	375165.18
3	25	CEF-08-SS-043	2137833.42	375155.63
3	26	CEF-08-SS-042	2137883.01	375196.10
3	27	NA	2137923.44	375236.26
4	28	CEF-08-SS-054	2137701.60	375100.71
4	29	CEF-08-SS-055	2137676.98	375074.07
4	30	CEF-8-SS-52	2137706.10	375066.65
5	31	CEF-8-SS-55	2137604.40	374964.69
5	32	CEF-08-SS-056	2137638.32	374963.69
5	33	CEF-08-SS-057	2137605.57	374927.50
6	34	CEF-08-SS-058	2137491.15	374773.14
6	35	CEF-08-SS-059	2137464.11	374812.78
6	36	CEF-8-SS-72	2137503.16	374807.39

**NOTE:**

NA: Not Applicable

TABLE 3-2

**PROPOSED CONFIRMATORY SAMPLE LOCATIONS  
OPERABLE UNIT 3, SITE 8  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

Sample	Location				Depth (ft bgs)	Analysis TRPH
	Area No.	Location	Northing	Easting		
CEF-08-CS-001	1	NE Pit Sidewall	2138069.83	375300.10	1-2	C
CEF-08-CS-002	1	NE Pit Sidewall	2138028.85	375294.58	1-2	C
CEF-08-CS-003	1	NW Pit Sidewall	2138064.91	375260.77	1-2	C
CEF-08-CS-004	2	SE Pit Sidewall	2137979.38	375241.39	1-2	C
CEF-08-CS-005	2	NW Pit Sidewall	2138017.15	375207.31	1-2	C
CEF-08-CS-006	2	SW Pit Sidewall	2137968.56	375192.38	1-2	C
CEF-08-CS-007	3	NW Pit Sidewall	2137894.15	375225.67	1-2.5	C
CEF-08-CS-008	3	NE Pit Sidewall	2137882.09	375276.84	1-2.5	C
CEF-08-CS-009	3	SE Pit Sidewall	2137823.69	375290.52	1-2.5	C
CEF-08-CS-010	3	SW Pit Sidewall	2137841.63	375239.63	1-2.5	C
CEF-08-CS-011	3	West, Bottom	2137837.35	375195.04	1	G
CEF-08-CS-012	3	Center, Bottom	2137809.78	375259.66	1	G
CEF-08-CS-013	3	East, Bottom	2137740.19	375295.37	1	G
CEF-08-CS-014	4	Center, Bottom	2137694.48	375080.5	1	G
CEF-08-CS-015	5	Center, Bottom	2137614.63	374952.14	1	G
CEF-08-CS-016	6	Center, Bottom	2137487.77	374799.93	1	G

**NOTES:**

- C: Composite sample obtained from sidewall locations.  
G: Grab sample obtained from bottom of excavation.

- 8.1 In pit areas, additional excavation, if required, will consist of extending the horizontal limit of excavation as directed by the Resident Officer in Charge of Construction (ROICC) and excavating soil in the extended area to a depth of one foot below the groundwater elevation.
- 8.2 In the other areas, additional excavation if required will consist of extending the horizontal limit of excavation as directed by the ROICC and excavating soil in the extended area to a depth of one foot bgs.
9. Any surface water or groundwater entering the excavation will not be removed.
10. After receipt of confirmatory sample test results which do not exceed the 350 mg/kg TRPH criteria, the excavated areas will be backfilled with clean fill and compacted in 12-inch lifts (maximum) to within 6 inches of grade. A 6-inch layer of topsoil will be placed on top of the backfilled areas. The disturbed areas will be graded to match existing contour elevations, and irregularities in finished surfaces will be corrected to eliminate depressions.
- 11 All disturbed areas will be stabilized by seeding. Seed type will match existing vegetation. Seeding will be provided at the rate of five pounds per 1,000 square feet. The disturbed and seeded areas will be mulched and watered to establish an acceptable stand of grass. A uniform erosion resistant perennial vegetative cover of at least 70 percent will be achieved.
12. Temporary erosion and sediment control measures will be removed.

## 4.0 CLEANUP CRITERION SELECTION

The soil cleanup criterion was selected based on a comparison that was performed of the respective consequences of removing soil contaminated with TRPHs in excess of the industrial (2,500 mg/kg) or residential (350 mg/kg) exposure criteria, as defined in the State of Florida Brownfields Cleanup Criteria Rule. A summary of this comparison is presented on Table 4-1.

Removing soil contaminated with TRPHs in excess of the residential rather than industrial exposure criterion would significantly reduce the need for institutional controls and thus lessen the administrative burden of post removal action monitoring. Removing soil contaminated with TRPHs in excess of the residential exposure criterion would also maximize the flexibility of post-removal action site use and thus guarantee site transfer acceptance. However, the overall cost would be approximately three times higher.

On the basis of this rationale, the BCT agreed that the cleanup goal for the upcoming soil removal action will be the residential exposure criterion of 350 mg/kg TRPH as defined by the State of Florida Brownfields Cleanup Criteria Rule.

**TABLE 4-1**

**SUMMARY COMPARISON  
SOIL REMOVAL TO RESIDENTIAL VS. INDUSTRIAL LEVELS  
OPERABLE UNIT 3, SITE 8  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

<b>REMOVAL TO RESIDENTIAL LEVEL</b>	<b>REMOVAL TO INDUSTRIAL LEVEL</b>
Would require excavation and disposal of 2,215 yd <sup>3</sup> of soil at a cost of \$306,000 <sup>(1)</sup>	Would require excavation and disposal of 511 yd <sup>3</sup> of soil at a cost of \$109,000 <sup>(1)</sup>
No institutional controls would be required for surface soil. Once cleanup goals have been reached for groundwater, institutional controls could be stopped altogether.	Institutional controls would be required for the foreseeable future for both surface soil and groundwater.
Estimated cost of institutional controls would be \$39,200 <sup>(2)</sup>	Estimated cost of institutional controls would be \$58,800 <sup>(2)</sup>
No "Dirty Transfer" would be required for soil.	"Dirty Transfer" would be required for both soil and groundwater.
There would be no limitation to use of property following transfer.	Following transfer, approximately 80% of the property would be limited to use as an airport and forestry reserve and the remaining 20% could be used for recreational facilities.
Only minimal continued Navy presence would be required.	Significant continued Navy presence would be required to insure continued compliance with institutional controls.
City of Jacksonville would readily accept transfer.	City of Jacksonville might not readily accept transfer.

**NOTES:**

- 1 Cost of removal to residential level as per cost estimate presented in Appendix B of Draft Remedial Design for Soils, Operable Unit 3, Site 8 (TtNUS, November 1998). Cost of removal to industrial level based on same estimate, pro-rated for reduced volume.
- 2 Based upon \$1,200/year for site inspection (16 hours @ \$75/hour) plus \$3,800 every 5 years for site review. Duration of Institutional Controls estimated at 20 years for removal to residential level and 30+ years for removal at industrial level. The institutional controls cost does not include sampling and analysis activities that may be required for post closure inspection.

## REFERENCES

ABB Environmental Services, Inc., August 1997. Remedial Investigation, Operable Unit 3, Sites 7 and 8, Naval Air Station Cecil Field, Jacksonville, Florida prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB Environmental Services, Inc., September 1996. Remedial Investigation Data Document, Operable Unit 3, Naval Air Station Cecil Field, Jacksonville, Florida prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB Environmental Services, Inc., March 1998. Record of Decision, Site 8, Operable Unit 3, Naval Air Station Cecil Field, Jacksonville, Florida prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

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