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ADDENDUM B WORK PLAN FOR INVESTIGATION OF CONTAMINATED SOIL AT STUDY
AREA 54 NTC ORLANDO FL
4/1/2001
TETRA TECH

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**ADDENDUM B
WORK PLAN
FOR THE INVESTIGATION
OF CONTAMINATED SOIL**

STUDY AREA 54

Naval Training Center
Orlando, Florida



**Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0024**

APRIL 2001

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TETRA TECH NUS, INC.

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0401-E111

April 23, 2001

Commander, Southern Division
Naval Facilities Engineering Command
Attn: Ms. Barbara Nwokike, Code 1873
P.O. Box 190010
2155 Eagle Drive
North Charleston, SC 29419-9010

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 0024

Subject: Work Plan Addendum B for Study Area 54
Naval Training Center, Orlando

Dear Ms. Nwokike:

Enclosed is a work plan addendum for performing the PAH leachability testing at Study Area 54, as agreed upon by the Orlando Partnering Team. Please contact me at (865) 220 4730 if you have any questions or need additional information.

Sincerely,

Steven B. McCoy, P.E.
Task Order Manager

Enclosure

SBM:tko

- c: Mr. Rick Allen, Harding Lawson Associates
- Mr. David Grabka, FDEP
- Mr. Wayne Hansel, SOUTHDIV (2)
- Ms. Nancy Rodriguez, USEPA Region 4
- Mr. Steve Tsangaris, CH2M Hill
- Mr. Michael J. Campbell, TtNUS
- Mr. Mark Perry, TtNUS (unbound)
- File/Edb

**ADDENDUM B
TO THE WORK PLAN
FOR THE INVESTIGATION
OF CONTAMINATED SOIL**

STUDY AREA 54

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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

Submitted to:

**Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406**

Submitted by:

**Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220**

**CONTRACT NO. N62467-94-D-0888
CONTRACT TASK ORDER 0024**

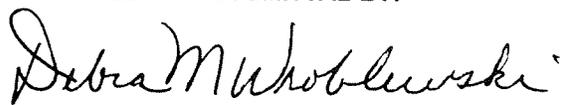
April 2001

PREPARED UNDER THE SUPERVISION OF:



**STEVEN B. MCCOY
TASK ORDER MANAGER
TETRA TECH NUS, INC.
OAK RIDGE, TENNESSEE**

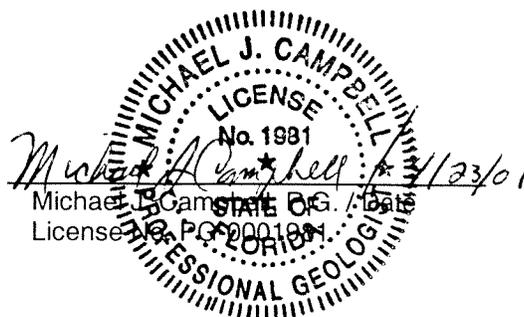
APPROVED FOR SUBMITTAL BY:



**DEBBIE WROBLEWSKI
PROGRAM MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA**

PROFESSIONAL GEOLOGIST CERTIFICATION

I hereby certify that this document, *Addendum B, Work Plan for the Investigation of Contaminated Soil, Study Area 54*, Naval Training Center, Orlando, Florida, was prepared under my direct supervision in accordance with acceptable standards of geological practice.



WORK PLAN ADDENDUM B

Installation of a Temporary Well, and Soil and Groundwater Sampling Study Area 54 Naval Training Center, Orlando, Florida

1.0 INTRODUCTION

Previous soil sampling at Site SA 54 revealed significantly elevated concentrations of polynuclear aromatic hydrocarbons (PAHs) in near-surface soils. As Figure 1 shows, observed concentrations were greater than 100 mg/kg at sampling locations 49 and 60. This addendum to the *Work Plan for the Investigation of Contaminated Soil, Study Area 54, Naval Training Center, Orlando, Florida* (Work Plan) (TtNUS, 2000a) provides guidance for soil sampling, installation of a temporary well, and groundwater sampling to help assess the potential for leaching of PAHs into groundwater at one of the two points. All fieldwork, including well installation, soil and groundwater sampling, documentation, and decontamination will be conducted in accordance with the Work Plan and the following guidance documents:

- *Project Operations Plan for Site Investigations and Remedial Investigations, Naval Training Center, Orlando, Florida* (POP) (ABB-ES, 1997).
- *Health and Safety Plan for Completion of Investigative Work and Data Sampling, Naval Training Center, Orlando, Florida* (TtNUS, 2001).

1.1 OBJECTIVES

The objectives of this supplemental investigation are to:

- Install one temporary 2-inch monitoring well at sampling location 49 or 60 (to be determined by the TtNUS field geologist and as noted below) where previous soil sampling detected significantly elevated concentrations of PAHs in soils.
- Collect one soil sample at the same location from a depth of 0 to 1 foot below ground surface (bgs) to confirm the presence of elevated levels of PAHs and determine the leachability of the compounds into the groundwater.
- Analyze the soil sample for total PAHs and leached PAHs using SW-846 Method 8310. The Synthetic Precipitation Leaching Procedure (SPLP), SW-846 Method 1312 will be used to prepare

LEGEND

- Benzo(a)pyrene_{equiv} ISOCONTOUR¹ (DASHED WHERE APPROX.) —
- Benzo(a)pyrene_{equiv} CONCENTRATION¹ 44.3
- SOIL SAMPLE +
- MULTIPLE PAH +
- Benzo(a)pyrene +
- NO PAH +
- NOT ANALYZED +

FDEP SCTL ¹ FOR Benzo(a)pyrene	
RESIDENTIAL	INDUSTRIAL
0.1	0.5

¹-CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)

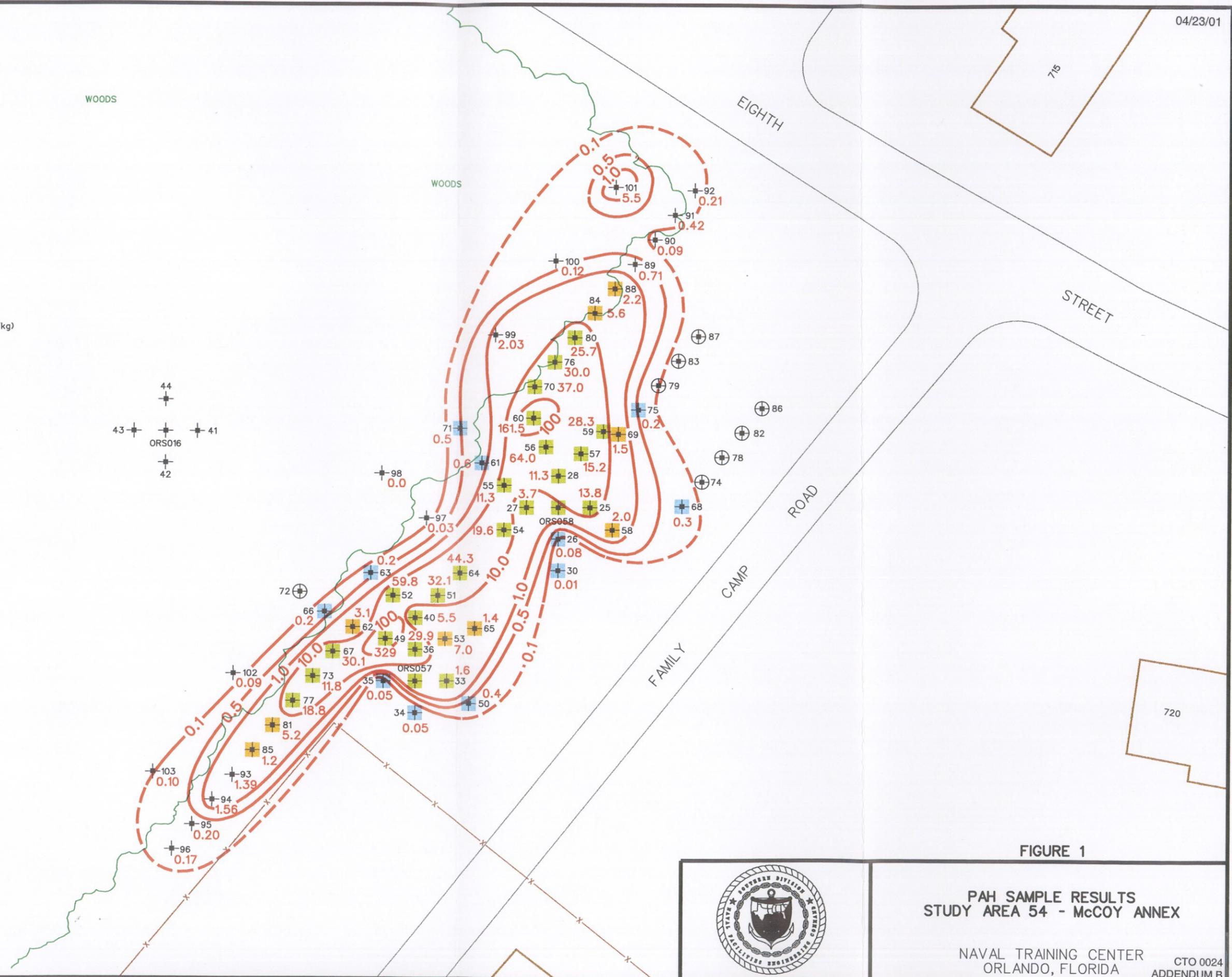


FIGURE 1

**PAH SAMPLE RESULTS
STUDY AREA 54 - MCCOY ANNEX**

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

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the leachate. The introduction to the method says, "Method 1312 is designed to determine the mobility of both organic and inorganic analytes in liquids, soils, and wastes" (USEPA, 1994).

- Collect one groundwater sample from the temporary well.
- Analyze the groundwater sample for PAHs using SW-846 Method 8310.

The temporary monitoring well will be installed at sampling location 60 if site conditions permit. Location 60 is readily accessible, while landscaping makes access to location 49 more difficult. The field geologist may move the activities to location 49, if necessary, based on access considerations.

2.0 SOIL SAMPLING, TEMPORARY WELL INSTALLATION, AND GROUNDWATER SAMPLING

2.1 SOIL SAMPLING

A soil sample and a duplicate sample will be collected from the 0 to 1-foot depth interval, placed in 4-ounce glass sample jars, then placed on ice until shipment to an analytical laboratory at the end of the workday.

2.2 TEMPORARY WELL INSTALLATION

A 2-inch temporary well with a 4-foot-long screen will be installed through a hollow stem auger at the soil sampling location. The screen and riser will be made of polyvinyl chloride with 0.010-inch slots. The screen and riser will be assembled with flush threads and no solvents will be used. The field geologist will select the well depth such that the center of the screen will be at the depth of the water table. Clean silica sand of U.S. Standard Sieve Size No. 30 to 65 will be used to create a sand pack and fill the annulus around the riser to the surface. A temporary cap will be provided during the period between well installation and acceptance of the groundwater sampling results.

The temporary well will be developed until the discharge water is visibly clear or as determined by the field geologist (approximately 1 hour per 2-inch well). Field parameters, such as pH, temperature, specific conductance, and turbidity, will be obtained during development. All development wastewater will be drummed.

The well will be designated well OLD-54-TW1. Upon acceptance of the groundwater sampling results, the temporary well will be abandoned in accordance with the POP.

2.3 MONITORING WELL PURGING AND SAMPLING

A peristaltic pump using dedicated Teflon[®]-lined discharge tubing will be used for both purging and sampling of the temporary wells. A flow-through cell will be used for real-time groundwater parameter monitoring during purging.

The temporary well is to be purged using micro-flow purging techniques prior to sampling. The steps listed below are to be followed for the purging procedure.

1. The water level will be measured and recorded prior to placing the tubing into the well.
2. The discharge tubing will be lowered into the well as slowly as possible to minimize disturbance to the water in the well.
3. The end of the tubing will be positioned at the midpoint of the saturated screen length. The end of the tubing will be kept at least 2 feet above the bottom of the well, where practical, to minimize mobilization of any particulates present.
4. The water level will be measured and recorded before starting the pump.
5. Purging will begin with the pump at the lowest setting and will slowly increase until discharge occurs.
6. The water level will be checked again.

The following guidance applies to the purging of the temporary well.

- The pumping rate will be adjusted until there is little or no water level drawdown. Drawdown should be less than 0.3 foot unless site conditions warrant a change. If the least drawdown that can be achieved exceeds 0.3 foot but remains stable, the purging procedure will continue.
- The water level and pumping rate will be monitored and recorded every 3 to 5 minutes (or as appropriate) during purging. Pumping rate adjustments will be recorded (both time and flow rate). Adjustments are best made during the first 15 minutes of pumping to minimize purging time. During pump start-up, drawdown may exceed the 0.3-foot target and then recover as pump flow adjustments are made. Unless site conditions warrant a change, purging will proceed at approximately 100 mL/min.

- Field parameters will be monitored and recorded every 3 to 5 minutes (or as appropriate) for stabilization. Note: During the early phase of purging, emphasis will be placed on minimizing and stabilizing pumping stress and recording those adjustments.
- Purging will be considered complete when temperature, specific conductance, pH, oxidation reduction potential (ORP), and dissolved oxygen (DO) have stabilized and turbidity has stabilized below 10 Nephelometric Turbidity Units (NTUs) (USEPA, 1996).
- Stabilization is considered to be achieved when three consecutive readings, taken at 3- to 5-minute intervals, are within the limits listed below. If turbidity is greater than 10 NTUs and has not decreased significantly after 60 minutes, purging will be discontinued and sample collection will be performed at the discretion of the Project Manager.

Parameter	Unit	Limit
Temperature	Degrees Fahrenheit (°F)	± 5%
Specific Conductance	Micro-siemens/centimeter (µs/cm)	± 5%
pH	Standard Unit (SU)	± 0.1
Oxidation Reduction Potential (ORP)	Millivolts (mV)	± 5%
Dissolved Oxygen (DO)	Milligrams per liter (mg/L)	± 5%
Turbidity	Nephelometric Turbidity Unit (NTU)	± 5% for values > 7 ± 10% for values < 7

When purging is complete, groundwater sampling will be performed in accordance with the procedures specified in Section 4.5.2.2 of the POP (ABB-ES, 1997). The flow-through cell will be disconnected and sample bottles will be filled directly from the Teflon[®] or Teflon[®]-lined tubing using the vacuum jug assembly method.

One groundwater sample will be collected. Two 1-liter amber glass bottles are required for each sample. The sample will be placed on ice until shipment to an analytical laboratory at the end of the workday.

2.4 SAMPLE NUMBERING

The groundwater samples will be numbered as follows:

NTC54PNNDD

Where:

- NTC = Naval Training Center
 54 = Site designation
 P = Sample Type ("S" for surface soil, "G" for groundwater)
 NNN = Sample Location (e.g., 060)
 DD = Sample Depth (e.g., 16 or 30)

Samples for field duplicates will be identified with a "blind" number (e.g., NTC54D1000). The corresponding environmental sample will be noted in the field logbook. Assuming the samples are collected at location 60, the soil sample will be numbered NTC54S060001 and the groundwater sample will be numbered NTC54G060001.

3.0 SAMPLE ANALYSIS

All samples will be shipped to Katahdin Analytical Services for the following analyses:

Sample Medium	Analytical Method
Soil	<u>Total PAHs</u> SW-846 Method 8310 <u>Leached PAHs</u> SW-846 Methods 1312 and 8310
Groundwater	<u>PAHs</u> SW-846 Method 8310

Field personnel must ship samples on the day they are collected by Federal Express Overnight Priority delivery to:

Katahdin Analytical Services
 340 County Road #5
 Westbrooke, Maine 04098
 Attn: Andrea Colby
 (207) 874-2400
 FAX: (207) 775-4029

3.1 QUALITY CONTROL SAMPLES

Because only one groundwater sample and two soil samples are to be collected, no field duplicate or MS/MSD samples will be required. In addition, because disposable sampling equipment will be used, no rinsate or field blanks will be required.

4.0 DATA QUALITY AND DATA VALIDATION

The limits used for laboratory analytical data in this program will be those set by the Contract Laboratory Program for Level IV data quality criteria. Data will be validated as described in Section 4.0 of the Work Plan and *USEPA Contract Laboratory Program: National Functional Guidelines for Organic Data Review* (USEPA, 1999) prior to entry into the NTC Orlando database.

5.0 DECONTAMINATION

Drilling and soil sampling equipment will be decontaminated as described in Section 3.0 of the Work Plan. Groundwater sampling will employ disposable tubing, so no decontamination will be required.

6.0 INVESTIGATION-DERIVED WASTE (IDW) MANAGEMENT

Drill cuttings, development and purge water, and decontamination fluids will be drummed separately in drums provided by the drilling subcontractor. Field personnel will use a paint stick or other permanent marker to label the drums with the following information:

- Identification No. (TtNUS-54-xxx). Example: TtNUS-54-TW1 for waste derived from temporary well number 1.
- Company name (Tetra Tech NUS).
- Base contact (Wayne Hansel) and phone number [(407) 895-6714].
- Site (Study Area 54).
- Material in drum (e.g., soil cuttings or decontamination fluids).
- Date the IDW was produced.

Upon completion of activities, field personnel will assure that drum lids and bungs are secure and have the drums moved to the McCoy Annex drum storage area. Miscellaneous sampling material (e.g., gloves, tubing, and plastic) will be bagged and disposed of as refuse in approved dumpsters located near Building 1056 in Area C.

7.0 LOGBOOKS AND FORMS

Field personnel will document field activities as described in Section 5.0 of the Work Plan and TtNUS *Standard Operating Procedure SA-6.3, Field Documentation* (TtNUS, 2000b).

8.0 CONTACTS

Project Area	Responsible Personnel	Phone Number
Task Order Management	Steven McCoy	(865) 220-4730
Technical Issues	Michael Campbell or Allan Jenkins	(865) 220-4714 / 4724
Health & Safety	Matt Soltis	(412) 921-8912
Procurement	Sandy D'Alessandris	(412) 921-8435
Drilling Services	Tod Fullerton (GPI)	(407) 426-7885
Laboratory Services	Andrea Colby (Katahdin)	(207) 874-2400
Base Contact	Wayne Hansel (NTC) (SOUTHDIV/Charleston)	(407) 895-6714 (843) 820-5572

REFERENCES

ABB-ES (ABB Environmental Services, Inc.), 1997. *Project Operations Plan for Site Investigations and Remedial Investigations, Naval Training Center, Orlando, Florida.*

TtNUS (Tetra Tech NUS, Inc.), 2000a. *Work Plan for the Investigation of Contaminated Soil, Study Area 54, Naval Training Center, Orlando, Florida, Rev. 2.* April.

TtNUS, 2000b. *Standard Operating Procedure SA-6.3, Field Documentation, Rev. 1.* January.

TtNUS, 2001. *Health and Safety Plan for Completion of Investigative Work and Data Sampling, Naval Training Center, Orlando, Florida.* April.

USEPA (U.S. Environmental Protection Agency), 1994. *SW-846 Method 1312, Synthetic Precipitation Leaching Procedure.* September.

USEPA, 1999. *USEPA Contract Laboratory Program: National Functional Guidelines for Organic Data Review.* EPA/540/R-99/008, Office of Solid Waste and Emergency Response, Washington, D.C. October.