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NAS BRUNSWICK ME
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ADDENDUM
WORK PLAN TO INVESTIGATE AND REMOVE RELOCATED SOILS SITE 17

Naval Air Station
Brunswick, Maine

Prepared for:

Department of the Navy
Naval Facilities Engineering Command
BRAC Program Management Office - Northeast
4911 South Broad Street
Philadelphia, Pennsylvania 19112-1303

Contract No. N62472-02-D-0810
Contract Task Order No. 017

June 2009

Prepared by:

ECC
33 Boston Post Road West, Suite 340
Marlborough, MA 01752

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Alexander Easterday, P.G. — 16 JUNE 2009 — Date
Project Manager

Gina M. Calderone, P.G., C.P.G — 16 June 2009 — Date
Maine Certified Professional Geologist

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1. INTRODUCTION

This is an Addendum to the Site 17 Work Plan To Investigate And Remove Relocated Soils issued in October 2008. This addendum is being issued to document changes to the October 2008 Final Work Plan resulting from execution of the test pit excavations conducted in October 2008.

2. SPECIFIC CHANGES TO THE WORK PLAN

The specific changes for each revised section in the Final Work Plan (October 2008) are presented below.

Section 1.4 Applicable or Relevant and Appropriate Requirements

The following text is Section 1.4, which is a new section to the Final Work Plan.

Applicable or relevant and appropriate requirements (ARARs) are the federal and state requirements used to evaluate the site and guide the selected removal action. The Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA) and the National Priorities List (NPL) require that removal actions attain ARARs to the greatest extent practicable. The ARARs from the April 1993 Action Memorandum are provided in Appendix A (Final Work Plan, Appendix A) and are still appropriate for removal action(s) at Site 17.

Under the description of ARARs in the NCP (National Oil and Hazardous Substances Pollution Contingency Plan) and the Superfund Amendments and Reauthorization Act (SARA), state and federal environmental requirements that must be considered are:

- Chemical specific
- Location specific
- Action specific

These are described in the following sections:

Chemical-specific ARARs - Chemical-specific ARARs are usually health-or-risk based standards limiting the concentration of a chemical found in or discharged to the environment. Chemical-specific ARARs govern the extent of site cleanup and provide either actual cleanup levels or a basis for calculating such levels. The chemical-specific ARARs for Site 17 are presented in Table B-1 of Attachment B of the 1993 Action Memorandum.

Location-specific ARARs - Location-specific ARARs govern natural site features (e.g., wetlands, floodplains, sensitive ecosystems) and special manmade features such as special places of historical or archeological significance. These ARARs generally restrict the concentration of hazardous substances or the conduct of activities based solely on the site's particular characteristics or location. Table B-2 in Attachment B of the 1993 Action Memorandum is a synopsis of potential location-specific standards

listed by site feature. Location-specific ARARs for Site 17 consist of general natural resources and groundwater protection regulations. There are no regulated natural features, such as wetlands or floodplains, in the vicinity of Site 17.

Action-specific ARARs - Action-specific ARARs usually set performance or design standards, controls, or restrictions on actions at hazardous waste sites. Applicable performance or design standards must be considered to develop technically feasible alternatives. Table B-3 in Attachment B of the 1993 Action Memorandum is a synopsis of potential action-specific ARARs identified for the removal alternatives developed as part of the Engineering Evaluation/Cost Analysis (EE/CA).

RCRA Land Disposal Restrictions – Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs) could be applicable to the removal action. As set forth under 40 Code of Federal Regulations (CFR) Part 268, LDRs may be invoked for removal actions involving the disposal of certain hazardous wastes. LDRs prohibit land disposal of hazardous wastes not meeting specified treatment standards. LDRs establish treatment standards based on the Best Demonstrated Available Technology (BDAT) for a specific waste. A BDAT treatment standard can be either a concentration level to be achieved or a specified technology that must be used. If the standard is concentration-based, any treatment technology that can achieve the standard may be used. Wastes treated according to the specified treatment standard may be land-disposed in a RCRA-permitted (i.e., Subtitle C) facility following treatment.

Table B-4 in Attachment B of the 1993 Action Memorandum lists a number of chemicals detected during the Site 17 site evaluation and associated waste codes, as set forth under 40 CFR Part 261. This table also includes the concentration-treatment standards for wastes that have been promulgated under 40 CFR Part 268 as well as the technology used to develop each treatment standard.

Soils containing these contaminants are considered hazardous under the contained-in policy. This policy states that when any material contains a listed hazardous waste, that material carries the waste code and must be managed as a hazardous waste until it no longer contains the waste. Because the soils at Site 17 are contaminated with RCRA-regulated wastes that have promulgated treatment standards, LDRs would apply to proposed actions involving placement. Soil removed from the site will be disposed of in accordance with the appropriate hazardous waste regulations where applicable.

The highest concentration of DDT detected in Site 17 soils was 6.3 parts per million (ppm). California Listed wastes include soil that contains total halogenated organic compounds (e.g., DDT) at concentrations greater than or equal to 1,000 ppm. Soils above 1,000 ppm are prohibited from land disposal under the California List Prohibitions. California List wastes must be incinerated, in accordance with 40 CFR Part 264, Subpart O, before land disposal. Although soils at Site 17 are not above 1,000 ppm, incineration was chosen as the treatment technology for pesticide-contaminated soils located at Site 17 due to LDRs (non-wastewater treatment standards) for each constituent. In addition, when a treatment standard has been promulgated for a listed waste, the

waste-specific treatment standard takes precedence over the California List standard or prohibition. Although the site is located in Maine, the California List is a specific component of the U.S. EPA's RCRA regulations and is referenced for completeness.

Section 2 Project Organization and Responsibilities

Further details of the project organization and responsibilities are provided as Appendix C.

Section 3.3 Relocated Soils Identification

Added text to Section 3.3 to provide more detail with the Relocated Soils Identification section and added "Excavation, Transport, and Disposal of Contaminated Soils" to Section 3.3.

Results from the 14 October 2008 test pitting and soil sampling conducted at Site 17 under Section 3.3, indicated that the area of relocated soils is slightly larger than as presented in the Final Work Plan. A figure showing the locations of the test pit excavations and soil sample locations along with a summary table of the soil sampling results are presented in Attachment A. Based on this finding, the Navy is proposing to increase the total amount of soil to be removed from approximately 27 cubic yards (cu yds) to 53 cu yds. This increase in soil removal will be accomplished by the following actions:

- Increase the horizontal extent of the area to be excavated by 7.5 linear feet along the east, 2 linear feet along the west and south sides of the relocated soils area. The north side of the excavation, will be increased by 1 linear foot beyond the northern edge of the relocated soils along Avenue B due to the buried natural gas utility line which prevents further excavating in this direction.

- Increase the vertical extent of the area to be excavated by an additional 3 inches, bringing the total vertical extent to be excavated to 9 inches.

This extension of the excavation footprint will bring the dimension of the soil removal area to approximately 99.5 feet by 19 feet. Figure 1 shows the approximate extent of the additional soils to be removed from this area.

Following the excavation of contaminated soils and prior to backfilling, the excavation will be lined with a geotextile fabric to delineate the boundary between the native material and backfill material. This will serve as a boundary marker for the extent of the excavation of the relocated soils at Site 17. The final excavation limits will be recorded with a survey-quality GPS unit, or by a State of Maine licensed surveyor.

Backfill for the Site 17 relocated soils area will be obtained from the same vendor and source previously used for Site 9 Removal Action.

Excavation, Transport, and Disposal of Contaminated Soils

The soil excavation, transport, and disposal of the relocated soils from Site 17 will be conducted by subcontractors to Environmental Restoration (ER) LLC, located in Glastonbery, Connecticut, under subcontract to ECC. The ER subcontractors are Ameritech Environmental Services, Inc. (EPA ID No. –MER000500595) and New England Disposal Technologies, Inc. (EPA ID No. MAC300008059). The excavated relocated soils, contaminated with pesticides, will be transported under hazardous waste manifest to Recupere Sol, Inc., located in Saint Ambrose, Quebec, Canada, for disposal by thermal incineration.

Existing monitoring well MW-NASB-098 will be protected during excavation and backfilling activities by temporary installation of construction fencing and/or by installation of stakes and high visibility warning tape around the well location.

The following methods will be used to prevent conditions conducive to dust generation and suppress dust should it occur:

- Adjacent paved areas and roads used for construction traffic will be maintained free of tracked soil or fill materials;
- Exposed excavations, disturbed ground surfaces, and unpaved traffic areas will be maintained in a moist condition; and,
- A temporary decontamination pad will be utilized to keep adjacent paved areas clean.

Excavated soils will be direct-loaded into transport vehicles. It is not necessary to wait for results of confirmatory soil samples because the soils to be excavated were previously moved from Site 17 and temporarily stored at the present location.

A 'Notification of Intent to Export Hazardous Waste Material to Canada' was issued to U.S. EPA Headquarters (to the attention of Mrs. Jean Shaw) on 22 April 2009 by the Navy. U.S. EPA Headquarters assigned the file number 219/09 to this Notification. The Navy will insure that consent from Canada is received prior to executing the removal action.

Section 3.4 Soil Sampling

The following text replaces the first paragraph of text within Section 3.4 of the Work Plan.

Following excavation of the contaminated soils from this 99.5-ft by 19-ft area, a total of 18 confirmatory soil samples will be collected from the bottom of the excavation for laboratory analysis. Six confirmatory soil samples will be collected from the excavation sidewalls, including one sample from the each of the end walls and two samples from each of the long sidewalls. Each of the sidewall confirmatory soil samples will be collected from 6 inches above the bottom of the excavation to the bottom of the excavation.

The soil samples will be submitted for laboratory analysis of United States Environmental Protection Agency (US EPA) low-level Method 8081A and US EPA Method 8081A Modified

(total pyrethrins). Soil sampling locations for confirmatory sampling are shown on Figure 2. Table 1 provides a summary of the confirmatory soil sampling locations and details.

Quality Assurance/Quality Control (QA/QC) for the soil sampling will include; three field duplicates, one rinsate blank, and two matrix spike/matrix spike duplicate samples. Soil samples will be submitted to APPL, Inc. Laboratories, 4203 West Swift, Fresno, CA, for pesticide analysis by USEPA Method 8081 and US EPA Method 8081B. Standard laboratory analysis turn around times will apply. Sample locations will be located by ECC field personnel using sub-meter Global Positioning Satellite (GPS) methods.

The standard operating procedure for collecting confirmatory grab samples during remedial excavation work is summarized below:

- Remove debris, grass, roots, rocks or other material leaving only the bare soil.
- Prior to entering an excavation to sample the sidewalls, determine if the excavation presents a confined space or collapse hazard. For confined space or other excavations with forbidden entry, samples will be collected from the excavator bucket.
- When sampling from an excavator bucket or a spoil pile, remove the upper most layer of soil, as this soil may consist of non-representative adjacent soil layers.
- If entry into the excavation is possible, other sampling instruments (hand trowels, spoons, etc.) may be used, once the sidewall surface has been scraped to the original matrix. Use a stainless steel spoon or hand trowel to collect a sample.
- Collect the soil from the specified location and place the soil in a stainless steel mixing bowl. Avoid collecting oversized rocks, roots, or other non-soil debris. Collect enough soil volume from the desired depth to fill the required sample jar(s).
- Homogenize the soil in the mixing bowl, by the quartering method - divide the sample into quarters - mix each quarter thoroughly, and then remix all four quarters.
- From the homogenized soil, fill the sample jars as full as possible.

Following sample collection, all soil samples are placed in pre-cleaned jars with preservatives (as necessary) specific to each type of analyses being performed. Then, samples are placed on ice and kept cool until received by the laboratory.

Further details of this standard operating procedure are presented in Appendix D. Note – ECC will be utilizing the following SOP sections: Section 5.2.2 (Sample Homogenization for Non-VOC samples), Section 5.8.3.4 (In-Pit Sampling [note that this excavation is not greater than 4 feet below ground surface and is not a confined space), and Section 5.3 (Surface Soil Sampling [excavation bottom and side-wall faces are the surfaces] with samples being homogenized in accordance with Section 5.2.2).

Section 3.8 Completion Report

A new section, Section 3.8 Completion Report, is being added to Section 3 of the work plan.

The following information will be included in the completion report for this excavation task:

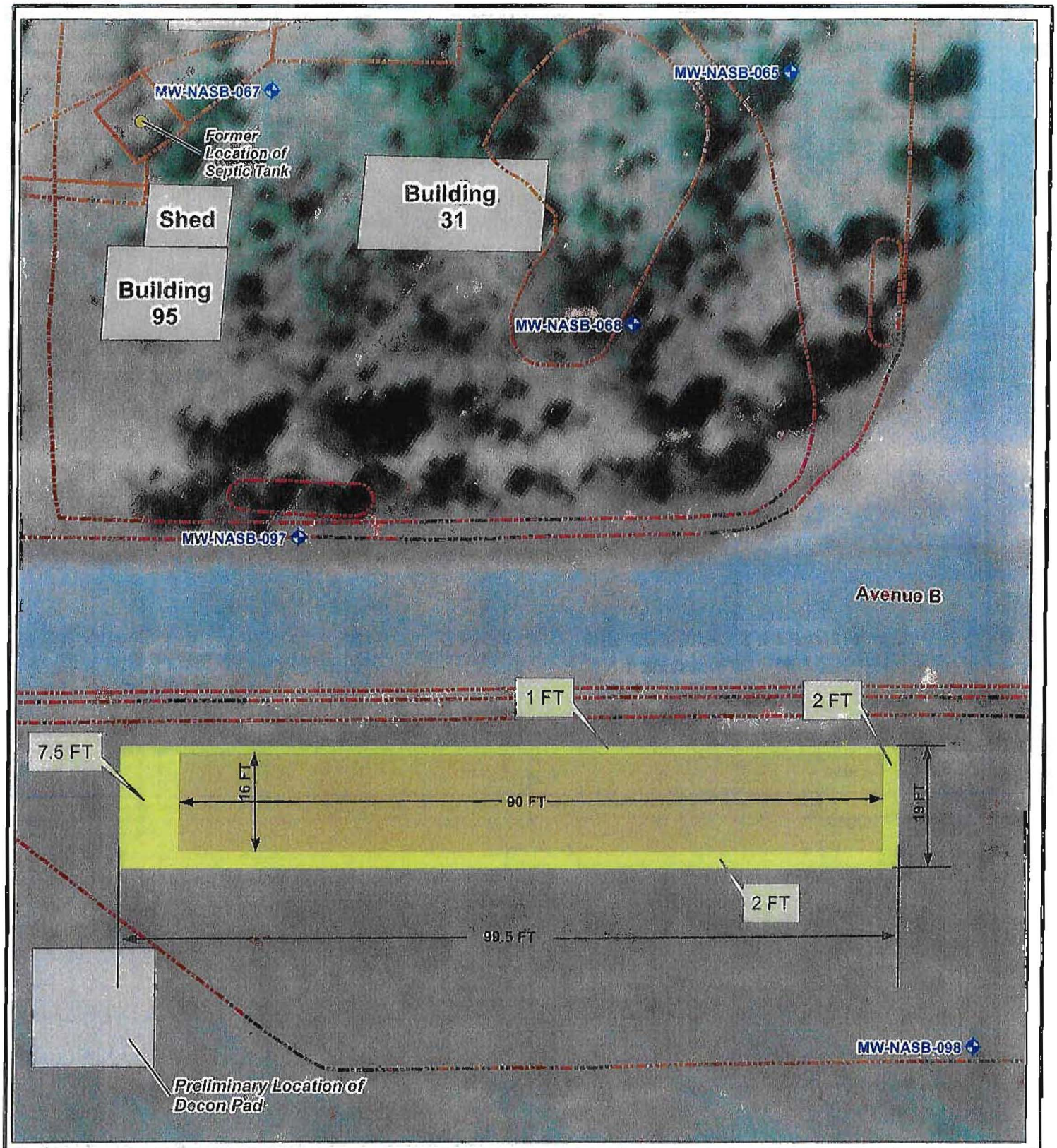
- Analytical data from the October 2008 test pit excavations;
- Surveyed limits of excavation at the Site 17 relocated soils area;
- Locations and results of confirmatory soil samples;
- Analytical data reports and chains of custody;
- Soil loading, transport, and disposal logs with signed manifests;
- Disposal facility weight tickets;
- Backfill and site restoration details; and,
- Photo log of construction activities.

Section 4. Schedule

This is a new section to the Work Plan.

ECC anticipates that the excavation of the relocated soils at Site 17 to be conducted in July 2009. Once ECC has scheduled a specific date in July 2009 with ER, ECC will notify all the project stakeholders of the specific date at least 10 days in advance of the field work.

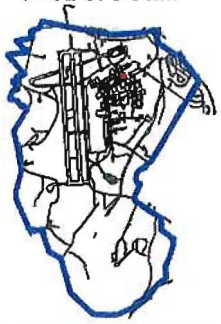
FIGURES



Contract No.	N62472-02-D-0810
Description	Site 17 Site Map
Coordinate system	NAD 1983, UTM, Zone 19 N In meter
Sources	Naval base boundary provided by Navy.

Date	16-JUN-2009	Rev.	Date	App. By
DB	C. Guido			
CB	J. Donovan			
AB				

Area of Detail



Legend

- Former Location of Septic Tank
- Monitoring Well
- Preliminary Location of Decon Pad
- Former Excavation Boundary (Approximate)
- Former Building
- Soil Relocation Area (Approximate)
- Additional Soil to be Removed

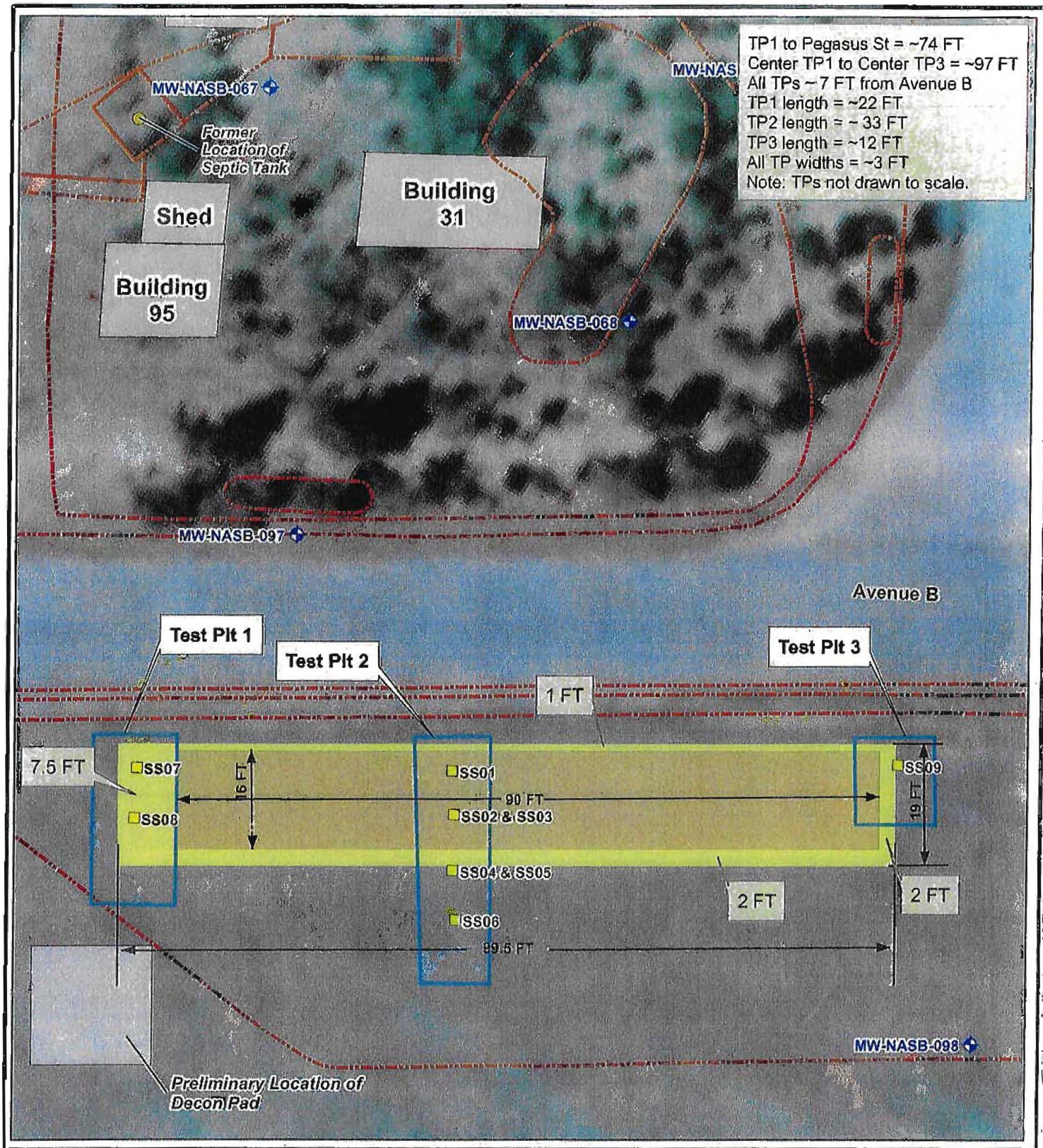
Figure 1

Site 17 Relocated Soil Removal

Naval Air Station
Brunswick, Maine

EDC Marlborough, MA
GIS C:\NAVY_GIS\1007_BrunswickNB\gis95\WPaddendum2009\MapDocuments\Fig1_Site17_RelocSoilRemoval.mxd

0 10 20 Feet



Contract No.	N62472-02-D-0810
Description	Site 17 Site Map
Coordinate system	NAD 1983, UTM, Zone 19 N in meter
Sources	Naval base boundary provided by Navy.

Date	16-JUN-2009	Rev.	Date	App. By
DB	C. Guido			
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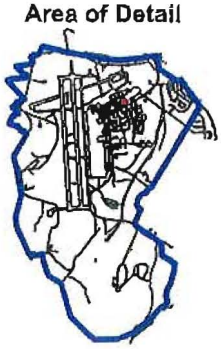
AB				

Area of Detail



Legend

- Test Pit Soil Sample Locations
- Former Location of Septic Tank
- Monitoring Well
- Preliminary Location of Decon Pad
- Test Pits
- Former Excavation Boundary (Approximate)
- Former Building
- Soil Relocation Area (Approximate)
- Additional Soil to be Removed

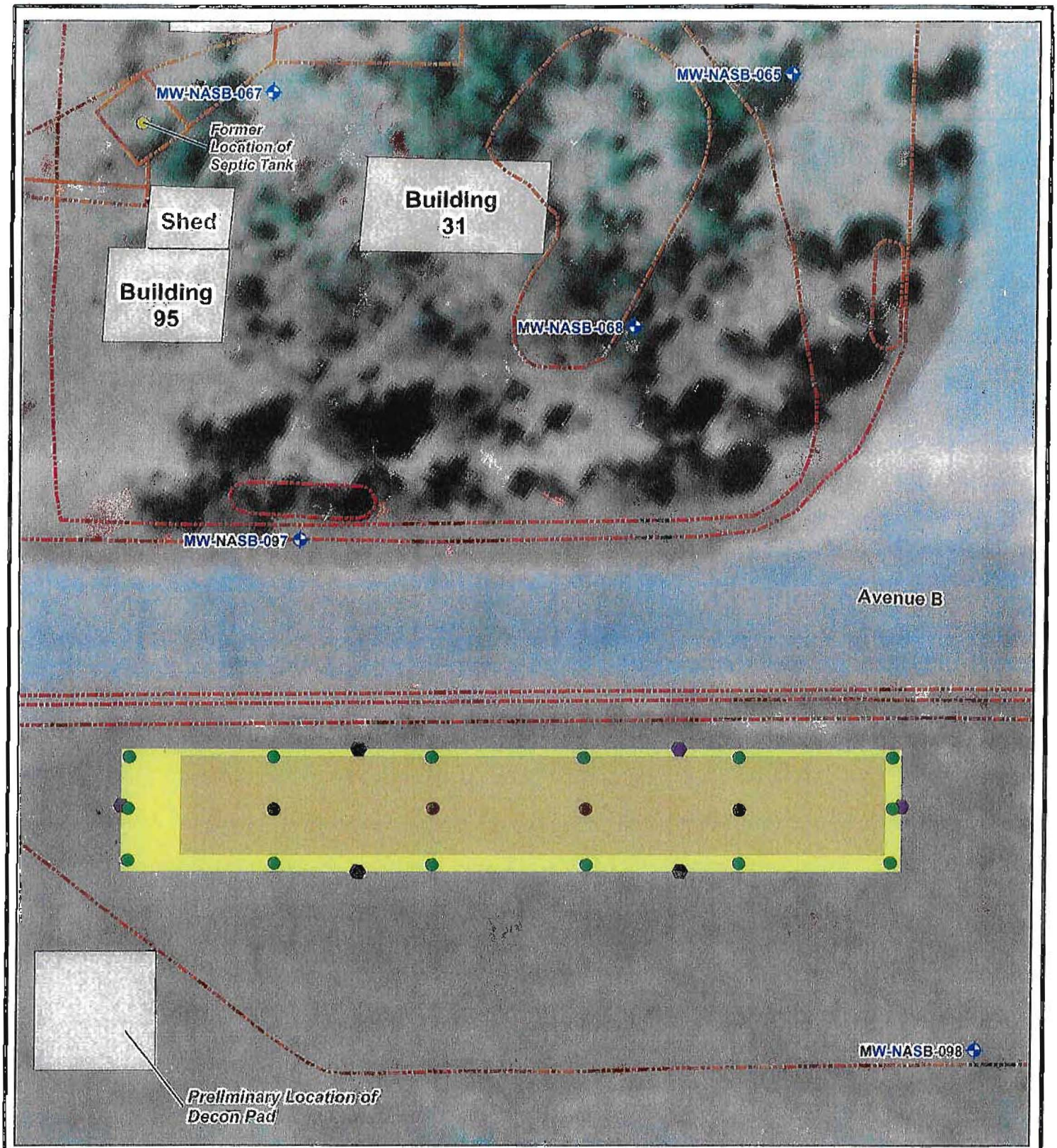
Figure 1A

Site 17 Test Pits

Naval Air Station
Brunswick, Maine

ECC Marlborough, MA
GIS C:\NAVY_GIS\TO07_Brunswick\Bldg95WP\addendum2009\MapDocuments\Fig1A_Site17_TestPits_rev1.mxd

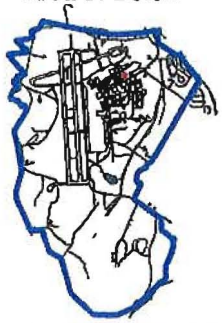
0 10 20 Feet



Contract No.	N62472-02-D-0810
Description	Site 17 Site Map
Coordinate system	NAD 1983, UTM, Zone 19 N In meter
Sources	Naval base boundary provided by Navy.

Date	18-JUN-2009	Rev.	Date	App. By
DB	C. Guido			
CB	J. Donovan			
AB				

Area of Detail



Legend

- Confirmation Soil Sampling Location (Bottom)
- Confirmation Soil Sampling Location (Sidewall)
- Former Location of Septic Tank
- Monitoring Well
- Preliminary Location of Decon Pad
- Former Excavation Boundary (Approximate)
- Former Building
- Soil Relocation Area (Approximate)
- Additional Soil to be Removed

Figure 2

Site 17 Confirmation Sampling Locations

Naval Air Station
Brunswick, Maine

ECC Marlborough, MA
GIS C:\NAVY_GIS\TO07_Brunswick\Bldg95WPadden\dwn2006\MapDocuments\Fig2_Site17_ConfirmSampling.mxd

0 10 20 Feet

TABLES

TABLE 1 - SUMMARY OF CONFIRMATORY SOIL SAMPLES
SITE 17, NAVAL AIR STATION BRUNSWICK, MAINE

Site	Confirmatory Sample ID	Anticipated Collection Depth (ft bgs)	Laboratory Analysis		Number of Sample Containers and Type of Containers	Sample Location
			USEPA Method low-level 8081A	USEPA Method 8081A Modified (total pyrethrins)		
Site 17	S17-PB-01	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-02	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-03	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-04	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-05	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-06	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-07	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-08	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-09	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-10	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-11	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-12	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-13	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-14	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-15	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-16	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-17	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-PB-18	2.5	X	X	1- 8 ounce glass jar	Bottom of Excavation
Site 17	S17-SW-01	1.5 – 2.0	X	X	1- 8 ounce glass jar	Side Wall of Excavation
Site 17	S17-SW-02	1.5 – 2.0	X	X	1- 8 ounce glass jar	Side Wall of Excavation
Site 17	S17-SW-03	1.5 – 2.0	X	X	1- 8 ounce glass jar	Side Wall of Excavation
Site 17	S17-SW-04	1.5 – 2.0	X	X	1- 8 ounce glass jar	Side Wall of Excavation
Site 17	S17-SW-05	1.5 – 2.0	X	X	1- 8 ounce glass jar	Side Wall of Excavation
Site 17	S17-SW-06	1.5 – 2.0	X	X	1- 8 ounce glass jar	Side Wall of Excavation

Notes:

1) Quality Assurance/Quality Control (QA/QC) for the soil sampling will include; three field duplicates, one rinsate blank, and two matrix spike/matrix spike duplicate samples.
2.) Soil samples will be submitted to APPL, Inc. Laboratories, 4203 West Swift, Fresno, CA under chain-of-custody (standard turn around times).
3) Total pyrethrins are defined as the following compounds, CAS # 8003-34-7 (pyrethrum), CAS # 121-21-1 (pyrethrin I), and CAS # 121-29-9 (pyrethrin II).
4) On the chain of custody, pesticides and total pyrethrins analysis will be indicated by marking, low-level 8081A to include CAS # 8003-34-7, CAS # 121-21-1, and CAS # 121-29-9.

APPENDICES

APPENDIX C

PROJECT ORGANIZATION AND RESPONSIBILITIES

PROJECT ORGANIZATION AND RESPONSIBILITIES

The individuals directly involved with this project and their specific responsibilities are outlined below:

Todd Bober, US Navy, BRAC PMO, Northeast, Remedial Project Manager – Provides overall project coordination and is the US Navy decision-maker for this project. Coordinates all activities within the US Navy for the project. Coordinates and resolves issues with regulatory case managers.

US Navy
BRAC Program Management Office Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303
Phone: (215) 897-4911

Lisa Joy, Environmental Director, Naval Air Station Brunswick – Naval Air Station Brunswick point of contact for any environmental issues, while conducting work at Naval Air Station Brunswick.

Environmental Department
Old Gurnet Road
Brunswick, ME
Phone: (207) 921-1720

Michael Fagan, Installation Restoration Program Manager, Naval Air Station Brunswick – Naval Air Station Brunswick daily point of contact for the contractor while conducting site activities at Site 17.

Environmental Department
Old Gurnet Road
Brunswick, ME
Phone: (207) 921-1717

Al Easterday, ECC, Project Manager – Oversees project financials, resources, scheduling, and technical management of all work efforts of the work plan.

ECC
33 Boston Post Road West, Suite 340
Marlborough, Massachusetts 01752
Phone: (508) 229-2270
Cell: (508) 726-0284

Chris Troy, ECC, Site Safety Officer – Provides senior review of the Site Health and Safety Plan, supports the field team, audits Tasks Orders as necessary for health and safety, and stop work decisions. Reviews consultant's and subcontractor's health and safety programs, as they relate to work under the Task Order, to ensure consistency with ECC's health and safety program.

ECC
33 Boston Post Road West, Suite 340
Marlborough, Massachusetts 01752
Phone: (508) 229-2270

Gina Calderone, ECC, Maine Certified Geologist – Provides senior review of the Work Plan to ensure that the deliverables meet ECC's quality assurance standards. Provides technical support to the project team.

ECC
33 Boston Post Road West, Suite 340
Marlborough, Massachusetts 01752
Cell: (845) 532-0236

Jeff Donovan and David Comeau, ECC, Geologist/Site Manager – Coordinates and shcedules field activities, directs the field team and subcontractors to ensure adherence to the Work Plan. Provides direct communication to the Project Manager.

ECC
33 Boston Post Road West, Suite 340
Marlborough, MA 01752
Phone: (508) 229-2270 ext. 123
Cell:(508) 509-1784

Jackson Kiker, ECC, Senior Chemist – Coordinates analysis with laboratory, ensures adherence to analytical requirements presented in the Work Plan, and conducts quality review of the laboratory data.

ECC
33 Boston Post Road West, Suite 340
Marlborough, MA 01752
Phone: (508) 229-2270 Ext 124

REGULATORS:

Claudia Sait, Maine Department of Environmental Protection, Remedial Project Manager – Responsible for MEDEP regulatory oversight.

State House, Station 17
Augusta, Maine 04333-0017
Phone: (207) 287-7713

Michael Daly, U.S. Environmental Protection Agancy, Region I, Remedial Project Manager – Responsible for EPA regulatory oversight.

1 Congress Street, Suite 1100 (HBT)
Boston, Massachusetts 02214-2023
Phone: (617) 918-1386

ECC SUBCONTRACTOR:

Rick Ramuglia, ER LLC, Project Manager – Soil excavation, loading, transport, and disposal.

Environmental Restoration, LLC
110 Granby, Bloomfield, Connecticut, 06002
Office Phone: (860) 769-7356
Cell Phone: (860) 881-7749

Chris May, ER LLC, Site Supervisor - Soil excavation, loading, transport, and disposal.

Environmental Restoration, LLC
110 Granby, Bloomfield, Connecticut, 06002
Office Phone: (860) 769-7356

Ken Hatch, ER LLC, Equipment Operator - Soil excavation, loading, transport, and disposal.

Environmental Restoration, LLC
110 Granby, Bloomfield, Connecticut, 06002
Office Phone: (860) 769-7356

APPENDIX D

STANDARD OPERATING PROCEDURES – SOIL SAMPLING

TETRA TECH NUS, INC.	STANDARD OPERATING PROCEDURES	Number SA-1.3	Page 1 of 20
		Effective Date 09/03	Revision 7
		Applicability Tetra Tech NUS, Inc.	
		Prepared Earth Sciences Department	
Subject SOIL SAMPLING		Approved D. Senovich	

TABLE OF CONTENTS

1.0 PURPOSE

This procedure discusses the methods used to collect surface, near surface, and subsurface soil samples. Additionally, it describes the method for sampling of test pits and trenches to determine subsurface soil and rock conditions, and recover small-volume or bulk samples.

2.0 SCOPE

This procedure is applicable to the collection of surface, near surface and subsurface soils for laboratory testing, which are exposed through hand digging, hand augering, drilling, or machine excavating at hazardous substance sites.

3.0 GLOSSARY

Composite Sample - A composite sample exists as a combination of more than one sample at various locations and/or depths and times, which is homogenized and treated as one sample. This type of sample is usually collected when determination of an average waste concentration for a specific area is required. Composite samples are not to be collected for volatile organics analysis.

Grab Sample - One sample collected at one location and at one specific time.

Non-Volatile Sample - A non-volatile sample includes all other chemical parameters (e.g., semivolatiles, pesticides/PCBs, metals, etc.) and those engineering parameters that do not require undisturbed soil for their analysis.

Hand Auger - A sampling device used to extract soil from the ground in a relatively undisturbed form.

Thin-Walled Tube Sampler - A thin-walled metal tube (also called a Shelby tube) used to recover relatively undisturbed soil samples. These tubes are available in various sizes, ranging from 2 to 5 inches outside diameter (OD) and from 18 to 54 inches in length.

Split-Barrel Sampler - A steel tube, split in half lengthwise, with the halves held together by threaded collars at either end of the tube. Also called a split-spoon sampler, this device can be driven into resistant materials using a drive weight mounted in the drilling string. A standard split-barrel sampler is typically available in two common lengths, providing either 20-inch or 26-inch longitudinal clearance for obtaining 18-inch or 24-inch-long samples, respectively. These split-barrel samplers commonly range in size from 2-inch OD to 3-1/2 inch OD. The larger sizes are commonly used when a larger volume of sample material is required.

Test Pit and Trench - Open, shallow excavations, typically rectangular (if a test pit) or longitudinal (if a trench), excavated to determine the shallow subsurface conditions for engineering, geological, and soil chemistry exploration and/or sampling purposes. These pits are excavated manually or by machine (e.g., backhoe, clamshell, trencher excavator, or bulldozer).

Confined Space - As stipulated in 29 CFR 1910.146, a confined space means a space that: 1) is large enough and so configured that an employee can bodily enter and perform assigned work; 2) has limited or restricted means for entry or exit (for example tanks, vessels, silos, storage bins, hoppers, vaults, pits, and excavations); and 3) is not designed for continuous employee occupancy. TtNUS considers all confined space as permit-required confined spaces.

4.0 RESPONSIBILITIES

Project Manager - The Project Manager is responsible for determining sampling objectives, as well as, the field procedures used in the collection of soil samples. Additionally, in consultation with other project personnel (geologist, hydrogeologist, etc.), the Project Manager establishes the need for test pits or trenches, and determines their approximate locations and dimensions.

Site Safety Officer (SSO) - The SSO (or a qualified designee) is responsible for providing the technical support necessary to implement the project Health and Safety Plan. This will include (but not be limited to) performing air quality monitoring during sampling, boring and excavation activities, and to ensure that workers and offsite (downwind) individuals are not exposed to hazardous levels of airborne contaminants. The SSO/designee may also be required to advise the FOL on other safety-related matters regarding boring, excavation and sampling, such as mitigative measures to address potential hazards from unstable trench walls, puncturing of drums or other hazardous objects, etc.

Field Operations Leader (FOL) - The FOL is responsible for finalizing the location of surface, near surface, and subsurface (hand and machine borings, test pits/trenches) soil samples. He/she is ultimately responsible for the sampling and backfilling of boreholes, test pits and trenches, and for adherence to OSHA regulations during these operations.

Project Geologist/Sampler - The project geologist/sampler is responsible for the proper acquisition of soil samples and the completion of all required paperwork (i.e., sample log sheets, field notebook, boring logs, test pit logs, container labels, custody seals, and chain-of-custody forms).

Competent Person - A Competent Person, as defined in 29 CFR 1929.650 of Subpart P - Excavations, means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

5.0 PROCEDURES

5.1 Overview

Soil sampling is an important adjunct to groundwater monitoring. Sampling of the soil horizons above the groundwater table can detect contaminants before they have migrated into the water table, and can establish the amount of contamination sorbed on aquifer solids that have the potential of contributing to groundwater contamination.

Soil types can vary considerably on a hazardous waste site. These variations, along with vegetation, can affect the rate of contaminant migration through the soil. It is important, therefore, that a detailed record be maintained during the sampling operations, particularly noting the location, depth, and such characteristics as grain size, color, and odor. Subsurface conditions are often stable on a daily basis and may demonstrate only slight seasonal variation especially with respect to temperature, available oxygen and light penetration. Changes in any of these conditions can radically alter the rate of chemical reactions or the associated microbiological community, thus further altering specific site conditions. As a result, samples must be kept at their at-depth temperature or lower, protected from direct light, sealed tightly in approved glass containers, and be analyzed as soon as possible.

The physical properties of the soil, its grain size, cohesiveness, associated moisture, and such factors as depth to bedrock and water table, will limit the depth from which samples can be collected and the method required to collect them. Often this information on soil properties can be obtained from published soil surveys available through the U.S. Geological Surveys and other government or farm agencies. It is the

intent of this procedure to present the most commonly employed soil sampling methods used at hazardous waste sites.

5.2 Soil Sample Collection

5.2.1 Procedure for Collecting Soil Samples for Volatile Organic Compounds

The above described traditional sampling techniques, used for the collection of soil samples for volatile organic analysis, have recently been evaluated by the scientific community and determined to be ineffective in producing accurate results (biased low) due to the loss of volatile organics in the sampling stages and microbial degradation of aromatic volatiles. One of the newly adopted sampling procedures for collecting soil samples includes the field preservation of samples with methanol or sodium bisulfate to minimize volatilization and biodegradation. These preservation methods may be performed either in the field or laboratory, depending on the sampling methodology employed.

Soil samples to be preserved by the laboratory are currently being performed using method SW-846, 5035. Laboratories are currently performing low level analyses (sodium bisulfate preservation) and high level analyses (methanol preservation) depending on the end users needs.

It should be noted that a major disadvantage of the methanol preservation method is that the laboratory reporting limits will be higher than conventional testing. The reporting levels using the new method for most analytes are 0.5 µg/g for GC/MS and 0.05 µg/g for GC methods.

The alternative preservation method for collecting soil samples is with sodium bisulfate. This method is more complex to perform in the field and therefore is not preferred for field crews. It should also be noted that currently, not all laboratories have the capabilities to perform this analysis. The advantage to this method is that the reporting limits (0.001 µg/g for GC/PID or GC/ELCD, or 0.010 for GC/MS) are lower than those described above.

The following procedures outline the necessary steps for collecting soil samples to be preserved at the laboratory, and for collecting soil samples to be preserved in the field with methanol or sodium bisulfate.

5.2.1.1 Soil Samples to be Preserved at the Laboratory

Soil samples collected for volatile organics that are to be preserved at the laboratory will be obtained using a hermetically sealed sample vial such as an EnCore™ sampler. Each sample will be obtained using a reusable sampling handle provided with the EnCore™ sampler. The sample is collected by pushing the EnCore™ sampler directly into the soil, ensuring that the sampler is packed tight with soil, leaving zero headspace. Using this type of sampling device eliminates the need for field preservation and the shipping restrictions associated with preservatives. A complete set of instructions is included with each Encore™ sampler shipment by the manufacturer.

Once the sample is collected, it should be placed on ice immediately and shipped to the laboratory within 48 hours (following the chain-of-custody and documentation procedures outlined in SOP SA-6.1). Samples must be preserved by the laboratory within 48 hours of sample collection.

If the lower detection limits are necessary, an option would be to collect several EnCore™ samplers at a given sample location. Send all samplers to the laboratory and the laboratory can perform the required preservation and analyses.

5.2.1.2 Soil Samples to be Preserved in the Field

Soil samples preserved in the field may be prepared for analyses using both the low-level (sodium bisulfate preservation) method and medium-level (methanol preservation) method.

Methanol Preservation (Medium Level):

Soil samples to be preserved in the field with methanol will utilize 40-60 mL glass vials with septum lids. Each sample bottle will be filled with 25 mL of demonstrated analyte-free purge and trap grade methanol. Bottles may be prespiked with methanol in the laboratory or prepared in the field.

Soil will be collected with the use of a decontaminated (or disposable), small-diameter coring device such as a disposable tube/plunger-type syringe with the tip cut off. The outside diameter of the coring device must be smaller than the inside diameter of the sample bottle neck.

A small electronic balance or manual scale will be necessary for measuring the volume of soil to be added to the methanol preserved sample bottle. Calibration of the scale should be performed prior to use and intermittently throughout the day according to the manufacturers requirements.

The sample should be collected by pulling the plunger back and inserting the syringe into the soil to be sampled. The top several inches of soil should be removed before collecting the sample. Approximately 10 grams ±2g (8-12 grams) of soil should be collected. The sample should be weighed and adjusted until obtaining the required amount of sample. The sample weight should be recorded to the nearest 0.01 gram in the field logbook and/or sample log sheet. The soil should then be extruded into the methanol preserved sample bottle taking care not to contact the sample container with the syringe. The threads of the bottle and cap must be free of soil particles.

After capping the bottle, swirl the sample (do not shake) in the methanol and break up the soil such that all of the soil is covered with methanol. Place the sample on ice immediately and prepare for shipment to the laboratory as described in SOP SA-6.1.

Sodium Bisulfate Preservation (Low Level):

Samples to be preserved using the sodium bisulfate method are to be prepared as follows:

Add 1 gram of sodium bisulfate to 5 mL of laboratory grade deionized water in a 40-60 mL glass vial with septum lid. Bottles may be prespiked in the laboratory or prepared in the field. The soil sample should be collected in a manner as described above and added to the sample container. The sample should be weighed to the nearest 0.01 gram as described above and recorded in the field logbook or sample log sheet.

Care should be taken when adding the soil to the sodium bisulfate solution. A chemical reaction of soils containing carbonates (limestone) may cause the sample to effervesce or the vial to possibly explode.

When preparing samples using the sodium bisulfate preservation method, duplicate samples must be collected using the methanol preservation method on a one for one sample basis. The reason for this is because it is necessary for the laboratory to perform both the low level and medium level analyses. Place the sample on ice immediately and prepare for shipment to the laboratory as described in SOP SA-6.1.

If the lower detection limits are necessary, an option to field preserving with sodium bisulfate would be to collect 3 EnCore™ samplers at a given sample location. Send all samplers to the laboratory and the laboratory can perform the required preservation and analyses.

5.2.2 Procedure for Collecting Non-Volatile Soil Samples

Non-volatile soil samples may be collected as either grab or composite samples. The non-volatile soil sample is thoroughly mixed in a stainless steel or disposable, inert plastic tray, using a stainless steel trowel or other approved tool, then transferred into the appropriate sample container(s). Head space is permitted in a non-volatile soil sample container to allow for sample expansion.

5.2.3 Procedure for Collecting Undisturbed Soil Samples (ASTM D1587-83)

When it is necessary to acquire undisturbed samples of soil for purposes of engineering parameter analysis (e.g., permeability), a thin-walled, seamless tube sampler (Shelby tube) will be employed. The following method will be used:

1. Remove all surface debris (e.g., vegetation, roots, twigs, etc.) from the specific sampling location and drill and clean out the borehole to the sampling depth, being careful to minimize the chance for disturbance of the material to be sampled. In saturated material, withdraw the drill bit slowly to prevent loosening of the soil around the borehole and to maintain the water level in the hole at or above groundwater level.

2. The use of bottom discharge bits or jetting through an open-tube sampler to clean out the borehole shall not be allowed. Use of any side-discharge bits is permitted.

3. A stationary piston-type sampler may be required to limit sample disturbance and aid in retaining the sample. Either the hydraulically operated or control rod activated-type of stationary piston sampler may be used. Prior to inserting the tube sampler into the borehole, check to ensure that the sampler head contains a check valve. The check valve is necessary to keep water in the rods from pushing the sample out the tube sampler during sample withdrawal and to maintain a suction within the tube to help retain the sample.

4. To minimize chemical reaction between the sample and the sampling tube, brass tubes may be required, especially if the tube is stored for an extended time prior to testing. While steel tubes coated with shellac are less expensive than brass, they're more reactive, and shall only be used when the sample will be tested within a few days after sampling or if chemical reaction is not anticipated. With the sampling tube resting on the bottom of the hole and the water level in the boring at groundwater level or above, push the tube into the soil by a continuous and rapid motion, without impacting or twisting. In no case shall the tube be pushed farther than the length provided for the soil sample. Allow about 3 inches in the tube for cuttings and sludge.

5. Upon removal of the sampling tube from the hole, measure the length of sample in the tube and also the length penetrated. Remove disturbed material in the upper end of the tube and measure the length of sample again. After removing at least an inch of soil from the lower end and after inserting an impervious disk, seal both ends of the tube with at least a 1/2-inch thickness of wax applied in a way that will prevent the wax from entering the sample. Clean filler must be placed in voids at either end of the tube prior to sealing with wax. Place plastic caps on the ends of the sample tube, tape the caps in place, and dip the ends in wax.

6. Affix label(s) to the tube as required and record sample number, depth, penetration, and recovery length on the label. Mark the "up" direction on the side of the tube with indelible ink, and mark the end of the sample. Complete Chain-of-Custody (see SOP SA-6.3) and other required forms (including Attachment A of this SOP). Do not allow tubes to freeze, and store the samples vertically with the same orientation they had in the ground, (i.e., top of sample is up) in a cool place out of the sun at all times. Ship samples protected with suitable resilient packing material to reduce shock, vibration, and disturbance.

Thin-walled undisturbed tube samplers are restricted in their usage by the consistency of the soil to be sampled. Often, very loose and/or wet samples cannot be retrieved by the samplers, and soils with a consistency in excess of very stiff cannot be penetrated by the sampler. Devices such as Dennison or Pitcher core samplers can be used to obtain undisturbed samples of stiff soils. Using these devices normally increases sampling costs, and therefore their use shall be weighed against the need for acquiring an undisturbed sample.

5.3 Surface Soil Sampling

The simplest, most direct method of collecting surface soil samples (most commonly collected to a depth of 6 inches) for subsequent analysis is by use of a stainless steel trowel. Surface soils are considered 0-12 inches bgs.

In general, the following equipment is necessary for obtaining surface soil samples:

- Stainless steel or pre-cleaned disposable trowel.
- Real-time air monitoring instrument (e.g., PID, FID, etc.).
- Latex gloves.
- Required Personal Protective Equipment (PPE).
- Required paperwork (see SOP SA-6.3 and Attachment A of this SOP).
- Required decontamination equipment.
- Required sample container(s).
- Wooden stakes or pin flags.
- Sealable polyethylene bags (i.e., Ziploc® baggies).
- Heavy duty cooler.
- Ice.
- Chain-of-custody records and custody seals.

When acquiring surface soil samples, the following procedure shall be used:

1. Carefully remove vegetation, roots, twigs, litter, etc., to expose an adequate soil surface area to accommodate sample volume requirements.

2. Using a decontaminated stainless steel trowel, follow the procedure cited in Section 5.2.1 for collecting a volatile soil sample. Surface soil samples for volatile organic analysis should be collected from 6-12 inches bgs only.

3. Thoroughly mix (in-situ) a sufficient amount of soil to fill the remaining sample containers and transfer the sample into those containers utilizing the same stainless steel trowel employed above. Cap and securely tighten all sample containers.

4. Affix a sample label to each container. Be sure to fill out each label carefully and clearly, addressing all the categories described in SOP SA-6.3.

5. Proceed with the handling and processing of each sample container as described in SOP SA-6.2.

5.4 Near-Surface Soil Sampling

Collection of samples from near the surface (depth of 6-18 inches) can be accomplished with tools such as shovels and stainless steel or pre-cleaned disposable trowels.

The following equipment is necessary to collect near surface soil samples:

- Clean shovel.
- The equipment listed under Section 5.3 of this procedure.
- Hand auger.

To obtain near-surface soil samples, the following protocol shall be observed:

1. With a clean shovel, make a series of vertical cuts to the depth required in the soil to form a square approximately 1 foot by 1 foot.
2. Lever out the formed plug and scrape the bottom of the freshly dug hole with a decontaminated stainless steel or pre-cleaned disposable trowel to remove any loose soil.
3. Follow steps 2 through 5 listed under Section 5.3 of this procedure.

5.5 Subsurface Soil Sampling With a Hand Auger

A hand augering system generally consists of a variety of all stainless steel bucket bits (i.e., cylinders 6-1/2" long, and 2-3/4", 3-1/4", and 4" in diameter), a series of extension rods (available in 2', 3', 4' and 5' lengths), and a cross handle. A larger diameter bucket bit is commonly used to bore a hole to the desired sampling depth and then withdrawn. In turn, the larger diameter bit is replaced with a smaller diameter bit, lowered down the hole, and slowly turned into the soil at the completion depth (approximately 6 inches). The apparatus is then withdrawn and the soil sample collected.

The hand auger can be used in a wide variety of soil conditions. It can be used to sample soil both from the surface, or to depths in excess of 12 feet. However, the presence of rock layers and the collapse of the borehole normally contribute to its limiting factors.

To accomplish soil sampling using a hand augering system, the following equipment is required:

- Complete hand auger assembly (variety of bucket bit sizes).
- Stainless steel mixing bowls.
- The equipment listed under Section 5.3 of this procedure.

To obtain soil samples using a hand auger, the following procedure shall be followed:

1. Attach a properly decontaminated bucket bit to a clean extension rod and further attach the cross handle to the extension rod.
2. Clear the area to be sampled of any surface debris (vegetation, twigs, rocks, litter, etc.).
3. Begin augering (periodically removing accumulated soils from the bucket bit) and add additional rod extensions as necessary. Also, note (in a field notebook, boring log, and/or on standardized data sheets) any changes in the color, texture or odor of the soil.
4. After reaching the desired depth, slowly and carefully withdraw the apparatus from the borehole.
5. Remove the soiled bucket bit from the rod extension and replace it with another properly decontaminated bucket bit. The bucket bit used for sampling is commonly smaller in diameter than the bucket bit employed to initiate the borehole.

6. Carefully lower the apparatus down the borehole. Care must be taken to avoid scraping the borehole sides.

7. Slowly turn the apparatus until the bucket bit is advanced approximately 6 inches.

8. Discard the top of the core (approximately 1"), which represents any loose material collected by the bucket bit before penetrating the sample material.

9. Fill volatile sample container(s), using a properly decontaminated stainless steel trowel, with sample material directly from the bucket bit. Refer to Section 5.2.1 of this procedure.

10. Utilizing the above trowel, remove the remaining sample material from the bucket bit and place into a properly decontaminated stainless steel mixing bowl and thoroughly homogenize the sample material prior to filling the remaining sample containers. Refer to Section 5.2.2 of this procedure.

11. Follow steps 4 and 5 listed under Section 5.3 of this procedure.

5.6 Subsurface Soil Sampling With a Split-Barrel Sampler (ASTM D1586-84)

Split-barrel (split-spoon) samplers consist of a heavy carbon steel or stainless steel sampling tube that can be split into two equal halves to reveal the soil sample (see Attachment B). A drive head is attached to the upper end of the tube and serves as a point of attachment for the drill rod. A removable tapered nosepiece/drive shoe attaches to the lower end of the tube and facilitates cutting. A basket-like sample retainer can be fitted to the lower end of the split tube to hold loose, dry soil samples in the tube when the sampler is removed from the drill hole. This split-barrel sampler is made to be attached to a drill rod and forced into the ground by means of a 140-lb or larger casing driver.

Split-barrel samplers are used to collect soil samples from a wide variety of soil types and from depths greater than those attainable with other soil sampling equipment.

The following equipment is used for obtaining split-barrel samples:

- Drilling equipment (provided by subcontractor).
- Split-barrel samplers (O.D. 2 inches, I.D. 1-3/8 inches, either 20 inches or 26 inches long); Larger O.D. samplers are available if a larger volume of sample is needed.
- Drive weight assembly, 140-lb. weight, driving head and guide permitting free fall of 30 inches.
- Stainless steel mixing bowls.
- Equipment listed under Section 5.3 of this procedure.

The following steps shall be followed to obtain split-barrel samples:

1. Remove the drive head and nosepiece, and open the sampler to reveal the soil sample. Immediately scan the sample core with a real-time air monitoring instrument (e.g., FID, PID, etc.). Carefully separate the soil core, with a decontaminated stainless steel knife or trowel, at about 6-inch intervals while scanning the center of the core for elevated readings. Also scan stained soil, soil lenses, and anomalies (if present), and record readings.

2. Collect the volatile sample from the center of the core where elevated readings occurred. If no elevated readings where encountered the sample material should still be collected from the core's

center (this area represents the least disturbed area with minimal atmospheric contact). Refer to Section 5.2.1 of this procedure.

3. Using the same trowel, remove remaining sample material from the split-barrel sampler (except for the small portion of disturbed soil usually found at the top of the core sample) and place the soil into a decontaminated stainless steel mixing bowl. Thoroughly homogenize the sample material prior to filling the remaining sample containers. Refer to Section 5.2.2 of this procedure.

4. Follow steps 4 and 5 listed under Section 5.3 of this procedure.

5.7 Subsurface Soil Sampling Using Direct Push Technology

Subsurface soil samples can be collected to depths of 40+ feet using direct push technology (DPT). DPT equipment, responsibilities, and procedures are described in SOP SA-2.5.

5.8 Excavation and Sampling of Test Pits and Trenches

5.8.1 Applicability

This subsection presents routine test pit or trench excavation techniques and specialized techniques that are applicable under certain conditions.

During the excavation of trenches or pits at hazardous waste sites, several health and safety concerns arise which control the method of excavation. No personnel shall enter any test pit or excavation over 4 feet deep except as a last resort, and then only under direct supervision of a Competent Person (as defined in 29 CFR 1929.650 of Subpart P - Excavations). Whenever possible, all required chemical and lithological samples should be collected using the excavator bucket or other remote sampling apparatus. If entrance is still required, all test pits or excavations must be stabilized by bracing the pit sides using specifically designed wooden or steel support structures. Personnel entering the excavation may be exposed to toxic or explosive gases and oxygen-deficient environments. Any entry may constitute a Confined Space and must be done in conformance with all applicable regulations. In these cases, substantial air monitoring is required before entry, and appropriate respiratory gear and protective clothing is mandatory. There must be at least two persons present at the immediate site before entry by one of the investigators. The reader shall refer to OSHA regulations 29 CFR 1926, 29 CFR 1910.120, 29 CFR 1910.134, and 29 CFR 1910.146.

Excavations are generally not practical where a depth of more than about 15 feet is desired, and they are usually limited to a few feet below the water table. In some cases, a pumping system may be required to control water levels within the pit, providing that pumped water can be adequately stored or disposed. If data on soils at depths greater than 15 feet are required, the data are usually obtained through test borings instead of test pits.

In addition, hazardous wastes may be brought to the surface by excavation equipment. This material, whether removed from the site or returned to the subsurface, must be properly handled according to any and all applicable federal, state, and local regulations.

5.8.2 Test Pit and Trench Excavation

These procedures describe the methods for excavating and logging test pits and trenches excavated to determine subsurface soil and rock conditions. Test pit operations shall be logged and documented (see Attachment C).

Test pits and trenches may be excavated by hand or by power equipment to permit detailed description of the nature and contamination of the in-situ materials. The size of the excavation will depend primarily on the following:

- The purpose and extent of the exploration.
- The space required for efficient excavation.
- The chemicals of concern.
- The economics and efficiency of available equipment.

Test pits normally have a cross section that is 4 to 10 feet square; test trenches are usually 3 to 6 feet wide and may be extended for any length required to reveal conditions along a specific line. The following table, which is based on equipment efficiencies, gives a rough guide for design consideration:

Equipment	Typical Widths, in Feet
Trenching machine	2
Backhoe	2-6
Track dozer	10
Track loader	10
Excavator	10
Scraper	20

The lateral limits of excavation of trenches and the position of test pits shall be carefully marked on area base maps. If precise positioning is required to indicate the location of highly hazardous waste materials, nearby utilities, or dangerous conditions, the limits of the excavation shall be surveyed. Also, if precise determination of the depth of buried materials is needed for design or environmental assessment purposes, the elevation of the ground surface at the test pit or trench location shall also be determined by survey. If the test pit/trench will not be surveyed immediately, it shall be backfilled and its position identified with stakes placed in the ground at the margin of the excavation for later surveying.

The construction of test pits and trenches shall be planned and designed in advance as much as possible. However, field conditions may necessitate revisions to the initial plans. The final depth and construction method shall be determined by the field geologist. The actual layout of each test pit, temporary staging area, and spoils pile will be predicated based on site conditions and wind direction at the time the test pit is made. Prior to excavation, the area can be surveyed by magnetometer or metal detector to identify the presence of underground utilities or drums.

As mentioned previously, no personnel shall enter any test pit or excavation except as a last resort, and then only under direct supervision of a Competent Person. If entrance is still required, Occupational Safety and Health Administration (OSHA) requirements must be met (e.g., walls must be braced with wooden or steel braces, ladders must be in the hole at all times, and a temporary guardrail must be placed along the surface of the hole before entry). It is emphasized that the project data needs should be structured such that required samples can be collected without requiring entrance into the excavation. For example, samples of leachate, groundwater, or sidewall soils can be taken with telescoping poles, etc.

Dewatering may be required to assure the stability of the side walls, to prevent the bottom of the pit from heaving, and to keep the excavation dry. This is an important consideration for excavations in cohesionless material below the groundwater table. Liquids removed as a result of dewatering operations must be handled as potentially contaminated materials. Procedures for the collection and disposal of such materials should be discussed in the site-specific project plans.

5.8.3 Sampling in Test Pits and Trenches

5.8.3.1 General

Test pits and trenches are usually logged as they are excavated. Records of each test pit/trench will be made as presented in Attachment C. These records include plan and profile sketches of the test pit/trench showing materials encountered, their depth and distribution in the pit/trench, and sample locations. These records also include safety and sample screening information.

Entry of test pits by personnel is extremely dangerous, shall be avoided unless absolutely necessary, and can occur only after all applicable Health and Safety and OSHA requirements have been met.

The final depth and type of samples obtained from each test pit will be determined at the time the test pit is excavated. Sufficient samples are usually obtained and analyzed to quantify contaminant distribution as a function of depth for each test pit. Additional samples of each waste phase and any fluids encountered in each test pit may also be collected.

In some cases, samples of soil may be extracted from the test pit for reasons other than waste sampling and chemical analysis, for instance, to obtain geotechnical information. Such information would include soil types, stratigraphy, strength, etc., and could therefore entail the collection of disturbed (grab or bulk) or relatively undisturbed (hand-carved or pushed/driven) samples, which can be tested for geotechnical properties. The purposes of such explorations are very similar to those of shallow exploratory or test borings, but often test pits offer a faster, more cost-effective method of sampling than installing borings.

5.8.3.2 Sampling Equipment

The following equipment is needed for obtaining samples for chemical or geotechnical analysis from test pits and trenches:

- Backhoe or other excavating machinery.
- Shovels, picks, hand augers, and stainless steel trowels/disposable trowels.
- Sample container - bucket with locking lid for large samples; appropriate bottleware for chemical or geotechnical analysis samples.
- Polyethylene bags for enclosing sample containers; buckets.
- Remote sampler consisting of 10-foot sections of steel conduit (1-inch-diameter), hose clamps and right angle adapter for conduit (see Attachment D).

5.8.3.3 Sampling Methods

The methods discussed in this section refer to test pit sampling from grade level. If test pit entry is required, see Section 5.8.3.4.

- Excavate trench or pit in several depth increments. After each increment, the operator will wait while the sampler inspects the test pit from grade level to decide if conditions are appropriate for sampling. (Monitoring of volatiles by the SSO will also be used to evaluate the need for sampling.) Practical depth increments range from 2 to 4 feet.

- The backhoe operator, who will have the best view of the test pit, will immediately cease digging if:

  - Any fluid phase or groundwater seepage is encountered in the test pit.
  - Any drums, other potential waste containers, obstructions or utility lines are encountered.
  - Distinct changes of material are encountered.

This action is necessary to permit proper sampling of the test pit and to prevent a breach of safety protocol. Depending upon the conditions encountered, it may be required to excavate more slowly and carefully with the backhoe.

For obtaining test pit samples from grade level, the following procedure shall be followed:

- Remove loose material to the greatest extent possible with backhoe.

- Secure walls of pit if necessary. (There is seldom any need to enter a pit or trench which would justify the expense of shoring the walls. All observations and samples should be taken from the ground surface.)

- Samples of the test pit material are to be obtained either directly from the backhoe bucket or from the material once it has been deposited on the ground. The sampler or Field Operations Leader directs the backhoe operator to remove material from the selected depth or location within the test pit/trench. The bucket is brought to the surface and moved away from the pit. The sampler and/or SSO then approaches the bucket and monitors its contents with a photoionization or flame ionization detector. The sample is collected from the center of the bucket or pile and placed in sample containers using a decontaminated stainless steel trowel or disposable spatula.

- If a composite sample is desired, several depths or locations within the pit/trench are selected and a bucket is filled from each area. It is preferable to send individual sample bottles filled from each bucket to the laboratory for compositing under the more controlled laboratory conditions. However, if compositing in the field is required, each sample container shall be filled from materials that have been transferred into a mixing bucket and homogenized. Note that homogenization/compositing is not applicable for samples to be subjected to volatile organic analysis.

- Using the remote sampler shown in Attachment D, samples can be taken at the desired depth from the side wall or bottom of the pit. The face of the pit/trench shall first be scraped (using a long-handled shovel or hoe) to remove the smeared zone that has contacted the backhoe bucket. The sample shall then be collected directly into the sample jar, by scraping with the jar edge, eliminating the need to utilize samplers and minimizing the likelihood of cross-contamination. The sample jar is then capped, removed from the assembly, and packaged for shipment.

- Complete documentation as described in SOP SA-6.3 and Attachment C of this SOP.

5.8.3.4 <u>In-Pit Sampling</u>

Under rare conditions, personnel may be required to enter the test pit/trench. This is necessary only when soil conditions preclude obtaining suitable samples from the backhoe bucket (e.g., excessive mixing of soils or wastes within the test pit/trench) or when samples from relatively small discrete zones within the test pit are required. This approach may also be necessary to sample any seepage occurring at discrete levels or zones in the test pit that are not accessible with remote samplers.

In general, personnel shall sample and log pits and trenches from the ground surface, except as provided for by the following criteria:

- There is no practical alternative means of obtaining such data.
- The Site Safety Officer and Competent Person determines that such action can be accomplished without breaching site safety protocol. This determination will be based on actual monitoring of the pit/trench after it is dug (including, at a minimum, measurements of volatile organics, explosive gases and available oxygen).
- A Company-designated Competent Person determines that the pit/trench is stable or is made stable (by grading the sidewalls or using shoring) prior to entrance of any personnel. OSHA requirements must be strictly observed.

If these conditions are satisfied, one person will enter the pit/trench. On potentially hazardous waste sites, this individual will be dressed in safety gear as required by the conditions in the pit. He/she will be affixed to a safety rope and continuously monitored while in the pit.

A second individual will be fully dressed in protective clothing including a self-contained breathing device and on standby during all pit entry operations. The individual entering the pit will remain therein for as brief a period as practical, commensurate with performance of his/her work. After removing the smeared zone, samples shall be obtained with a decontaminated trowel or spoon. As an added precaution, it is advisable to keep the backhoe bucket in the test pit when personnel are working below grade. Such personnel can either stand in or near the bucket while performing sample operations. In the event of a cave-in they can either be lifted clear in the bucket, or at least climb up on the backhoe arm to reach safety.

5.8.3.5 Geotechnical Sampling

In addition to the equipment described in Section 5.8.3.2, the following equipment is needed for geotechnical sampling:

- Soil sampling equipment, similar to that used in shallow drilled boring (i.e., open tube samplers), which can be pushed or driven into the floor of the test pit.
- Suitable driving (i.e., a sledge hammer) or pushing (i.e., the backhoe bucket) equipment which is used to advance the sampler into the soil.
- Knives, spatulas, and other suitable devices for trimming hand-carved samples.
- Suitable containers (bags, jars, tubes, boxes, etc.), labels, wax, etc. for holding and safely transporting collected soil samples.
- Geotechnical equipment (pocket penetrometer, torvane, etc.) for field testing collected soil samples for classification and strength properties.

Disturbed grab or bulk geotechnical soil samples may be collected for most soils in the same manner as comparable soil samples for chemical analysis. These collected samples may be stored in jars or plastic-lined sacks (larger samples), which will preserve their moisture content. Smaller samples of this type are usually tested for their index properties to aid in soil identification and classification, while larger bulk samples are usually required to perform compaction tests.

Relatively undisturbed samples are usually extracted in cohesive soils using open tube samplers, and such samples are then tested in a geotechnical laboratory for their strength, permeability and/or compressibility. The techniques for extracting and preserving such samples are similar to those used in performing Shelby tube sampling in borings, except that the sampler is advanced by hand or backhoe,

rather than by a drill rig. Also, the sampler may be extracted from the test pit by excavation around the sampler when it is difficult to pull it out of the ground. If this excavation requires entry of the test pit, the requirements described in Section 5.8.3.4 of this procedure must be followed. The open tube sampler shall be pushed or driven vertically into the floor or steps excavated in the test pit at the desired sampling elevations. Extracting tube samples horizontally from the walls of the test pit is not appropriate, because the sample will not have the correct orientation.

A sledge hammer or the backhoe may be used to drive or push the sampler or tube into the ground. Place a piece of wood over the top of the sampler or sampling tube to prevent damage during driving/pushing of the sample. Pushing the sampler with a constant thrust is always preferable to driving it with repeated blows, thus minimizing disturbance to the sample. If the sample cannot be extracted by rotating it at least two revolutions (to shear off the sample at the bottom), hand-excavate to remove the soil from around the sides of the sampler. If hand-excavation requires entry of the test pit, the requirements in Section 5.8.3.4 of this procedure must be followed. Prepare, label, pack and transport the sample in the required manner, as described in SOP SA-6.3 and SA-6.1.

5.8.4 Backfilling of Trenches and Test Pits

All test pits and excavations must be either backfilled, covered, or otherwise protected at the end of each day. No excavations shall remain open during non-working hours unless adequately covered or otherwise protected.

Before backfilling, the onsite crew shall photograph all significant features exposed by the test pit and trench and shall include in the photograph a scale to show dimensions. Photographs of test pits shall be marked to include site number, test pit number, depth, description of feature, and date of photograph. In addition, a geologic description of each photograph shall be entered in the site logbook. All photographs shall be indexed and maintained as part of the project file for future reference.

After inspection, backfill material shall be returned to the pit under the direction of the FOL.

If a low permeability layer is penetrated (resulting in groundwater flow from an upper contaminated flow zone into a lower uncontaminated flow zone), backfill material must represent original conditions or be impermeable. Backfill could consist of a soil-bentonite mix prepared in a proportion specified by the FOL (representing a permeability equal to or less than original conditions). Backfill can be covered by "clean" soil and graded to the original land contour. Revegetation of the disturbed area may also be required.

5.9 Records

The appropriate sample log sheet (see Attachment A of this SOP) must be completed by the site geologist/sampler. All soil sampling locations should be documented by tying in the location of two or more nearby permanent landmarks (building, telephone pole, fence, etc.) or obtaining GPS coordinates; and shall be noted on the appropriate sample log sheet, site map, or field notebook. Surveying may also be necessary, depending on the project requirements.

Test pit logs (see Attachment C of this SOP) shall contain a sketch of pit conditions. In addition, at least one photograph with a scale for comparison shall be taken of each pit. Included in the photograph shall be a card showing the test pit number. Boreholes, test pits and trenches shall be logged by the field geologist in accordance with SOP GH-1.5.

Other data to be recorded in the field logbook include the following:

- Name and location of job.
- Date of boring and excavation.

- Approximate surface elevation.
- Total depth of boring and excavation.
- Dimensions of pit.
- Method of sample acquisition.
- Type and size of samples.
- Soil and rock descriptions.
- Photographs.
- Groundwater levels.
- Organic gas or methane levels.
- Other pertinent information, such as waste material encountered.

6.0 REFERENCES

American Society for Testing and Materials, 1987. ASTM Standards D1587-83 and D1586-84. ASTM Annual Book of Standards. ASTM. Philadelphia, Pennsylvania. Volume 4.08.

NUS Corporation, 1986. Hazardous Material Handling Training Manual.

NUS Corporation and CH2M Hill, August, 1987. Compendium of Field Operation Methods. Prepared for the U.S. EPA.

OSHA, Excavation, Trenching and Shoring 29 CFR 1926.650-653.

OSHA, Confined Space Entry 29 CFR 1910.146.

ATTACHMENT A
SOIL & SEDIMENT SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: _____ Sample ID No.: _____
Project No.: _____ Sample Location: _____
Sampled By: _____
C.O.C. No.: _____

- [ ] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other _____
- [ ] QA Sample Type: _____

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION

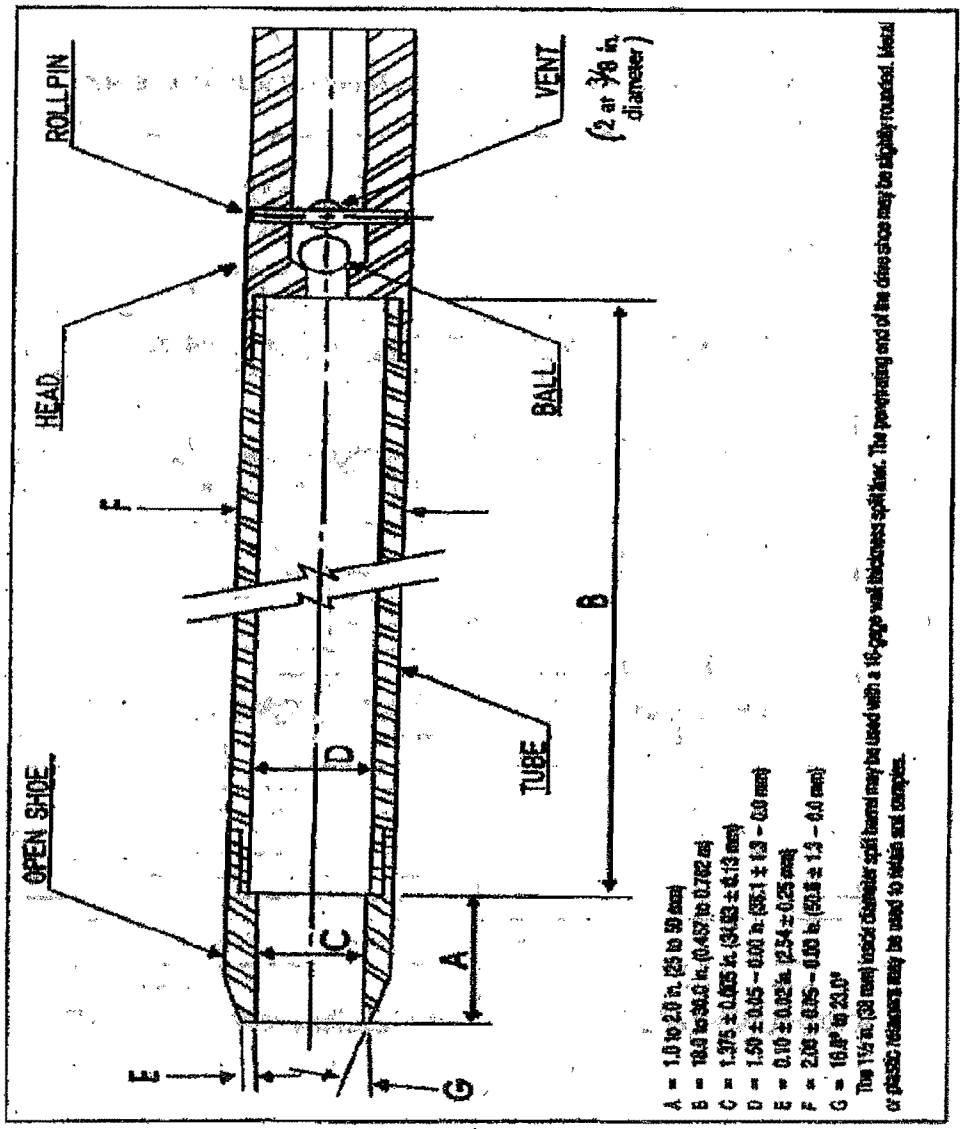
Analysis	Container Requirements	Collected	Other

OBSERVATIONS/NOTES

QUALITY CONTROL SAMPLES

MS/MSD	Duplicate ID No.:	Signature(s):

ATTACHMENT B
SPLIT-SPOON SAMPLER



ATTACHMENT C
TEST PIT LOG

Tetra Tech NUS, Inc.

TEST PIT LOG

Page ___ of ___

PROJECT NAME: _____ TEST PIT No.: _____
PROJECT NUMBER: _____ DATE: _____
LOCATION: _____ GEOLOGIST: _____

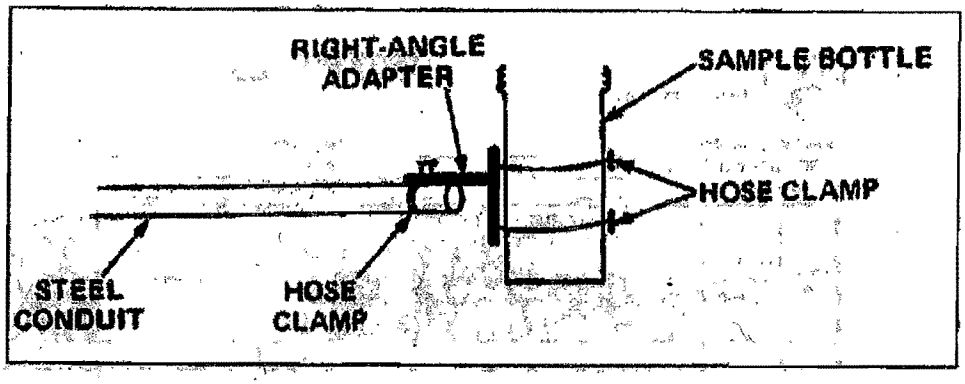
Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION	USCS	Remarks	PID/FID READING	

TEST PIT CROSS SECTION AND / OR PLAN VIEW

REMARKS: _____

PHOTO LOG: _____

ATTACHMENT D
REMOTE SAMPLE HOLDER FOR TEST PIT/TRENCH SAMPLING



APPENDIX E

REGULATOR COMMENT LETTERS, RESPONSE TO COMMENTS, AND CONCURRENCE LETTERS

REGULATOR COMMENT LETTERS

From: <Daly.Mike@epamail.epa.gov>
To: paul.burgio@navy.mil; todd.bober@navy.mil
CC: Jeff.Orient@tetratech.com; Charles.Race@tetratech.com; michael.fagan1@na...
Date: 5/8/2009 11:21 AM
Subject: NAS Brunswick: Draft Addendum - Site 17 Final Workplan to Investigate & RemoveRelocated Soils

Todd & Paul,

I've completed my review of the subject document. Given that this effort should be very straight forward, I focused only on those aspects of the plan that directly affect execution of the removal and future removal/remedial efforts that the Navy may need to take at Site 17 based on the results of the Site 17 remedial investigation that is currently underway.,

Page 2, Par 2: In addition to lining the excavation with a geo-textile fabric prior to backfilling, a survey of the final excavation limits should be completed with a survey-quality GPS unit.

Page 2, Par 2: As with the backfill used at Site 9, will the backfill for this project have chemical profiles available to confirm it is "clean"? Perhaps the Navy could rely on the same backfill supplier of the Site 9 project and confirm from that supplier that the material will come from the same source as the Site 9 project.

Page 2, Excavation, Transport, & Disposal of Contaminated Soils: Will excavated soils be stockpiled in piles or in roll-offs on-site prior to transport off-base or will they be excavated and directly loaded into trucks for transportation off-base? Will the Navy wait until receipt of confirmatory soil samples to validate the determination that no additional soils beyond the identified 50 cu yds are required to be removed before backfilling the excavation? These details are important and should be discussed in the workplan, especially if soils will be stockpiled and managed on-site for later transport off-base and the excavation will remain open for some period of time prior to backfilling.

Page 2, Excavation, Transport, & Disposal of Contaminated Soils: As with the ash/soil removal effort recently completed at Site 9, the Navy will need to submit to EPA headquarters in Washington, D.C., a notification of intent to export the hazardous waste from this effort to Canada. The notification describes the type and amount of waste, its itinerary, the number of shipments expected, and the period during which shipments will occur. EPA forwards this notification to the government(s) of Canada. The government of the importing country must consent to the shipment before it may proceed. The U.S. exporter may not allow a shipment to proceed unless EPA has notified it of the consent of the importing country. The exporter must attach the uniform hazardous waste manifest to the shipment (while the waste is traveling within the U.S.), and the acknowledgment of consent from the importing country.

A report summarizing the soil removal should be drafted to document the completion of this effort.

If you would like to discuss these comments further, please give me a call.

Thanks for the opportunity to review the document!

Have a good weekend,

Mike

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

May 12, 2009

Mr. Todd Bober
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Site 17- South of Avenue B, Soil Removal Addendum
Naval Air Station, Brunswick, Maine

Dear Mr. Bober:

Pursuant to Section VI of the Naval Air Station, Brunswick, Maine Federal Facility Agreement (Oct 1990), as amended, the Maine Department of Environmental Protection (MEDEP) has reviewed the draft "Addendum – Site 17 Final Work Plan to Investigate and Remove the Relocated Soils", dated April 22, 2009, prepared by ECC. Based on that review MEDEP has the following comments and issues.

General Comments:

1. It would be helpful if the title included the fact that the analytical results of the test pitting are included in this addendum. (If a separate letter report is still to be issued at a later date then this is not necessary.)

2. Please update the project organization and responsibilities list to include the sub-contractor's key personnel, EPA's and MEDEP's Remedial Project Managers, along with contact information.

3. MEDEP supports EPA's request for a closeout report. Please add a section in the workplan that outlines the information that will be included in the close out report.

4. PCB analysis is expected to be required for waste characterization for disposal. If the soil sample(s) contain PCBs at a level exceeding 1 ppm, additional site characterization and delineation will need to be conducted to determine if any PCBs remain at this site and to what extent. This investigation must include not only the area where the soils currently reside but the areas from which the soils were originally excavated. PCBs are regulated as hazardous waste in Maine and under Toxic Substances Control Act as well.

5. Please add a section on how the existing monitoring wells in the vicinity of the reburied contaminated soil will be protected during the excavation.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., 28 TYSON DR.

BANGOR
106 HOGAN ROAD
BANGOR, ME 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, ME 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, ME 04769-2094
(207) 764-0477 FAX: (207) 764-1507

web site: www.maine.gov/dep

printed on recycled paper

Specific Comments:

6. Page 1, Relocated Soils Identifications, bullet 1: It is difficult to determine looking at the various figures but if appears that the proposed horizontal extent of the area to be excavated does not include the area to the west where SS07 (DDT-5000 µg/kg) and SS08 (DDT- 6300 µg/kg) exceeded the Preliminary Remedial Goal (PRG) established by the Action Memorandum (1993) or the south central area (SS4 and SS6) where DDT concentrations also exceeded the PRGs of 500 µg/kg. The area to be excavated needs to be expanded to include these areas.

7. Page 2, Soil Sampling:

   a.) It is unclear why confirmation sampling is proposed for the bottom of the excavation but not for the sidewalls. It would take approximately 6 additional samples to confirm that the horizontal extent had been reached. (The RI samples in the area appear to have been too deep (2-3 ' bgs) to capture the buried contaminated soil so those analysis cannot be used in lieu of confirmation samples as proposed in the original workplan response to comments.)

   b.) Please provide the standard operating procedure for collecting the confirmation samples to MEDEP for review and approval prior to finalizing the workplan addendum.

8. Page 2, Excavation, Transportation, and Disposal of Contaminated Soils:

   a.) The State of Maine Hazardous Waste Management Rules, Chapter 853 requires all hazardous waste transporters to be licensed. MEDEP cannot find any record of Environmental Restoration (ER) LLC of [*Glastonbery*], CT being licensed with the State of Maine to transport hazardous waste. The Navy needs to make sure that ER has a Federal hazardous waste transporter number also.

   b.) To meet the Federal and State requirements for air quality, please address how dust suppression will be handled during excavation if it becomes necessary.

9. Section 3.4 of the original workplan indicates that the Investigation Derived Waste fluids would be sampled for total pyrethrins, this must be expanded to include DDT and the other pesticides analytes.

10. If the lined roll offs are going to be stored on site they must be properly labeled. Ideally, the roll off can be stored in a secure (locked) building with secondary containment. If this is not possible construction fencing should be installed around the reburied contaminated soil with room for the decon pad and storage. (If the excavation is to be held open after the excavation construction fence must be installed.)

11. Page 4, Applicable or Relevant and Appropriate Requirements, para 3: The information about California is superfluous and should be removed.

12. Figure 1: Please add the location of the decontamination pad to the workplan.

13. Table 1: Please add the sample locations to the table.

Please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: Hard Copy:

File
Ed Benedikt

Electronic Copy

Chris Evans-MEDEP
Paul Burgio –BRAC PMO
Al Easterday-ECC
Carol Warren
Gina Calderone-ECC
Suzanne Johnson-BASCE
Carolyn Lepage-Lepage Environmental
Mike Fagan-BNAS
Mike Daly-EPA
David Chipman
Catherine Guido-ECC
Vicki Boundy-MMRA
Scott Libby

RESPONSE TO REGULATOR COMMENTS

Responses to Comments
Provided by the U.S. Environmental Protection Agency
Draft Addendum – Site 17 Final Work Plan to Investigate and Remove Relocated Soils, 22 April 2009
Naval Air Station, Brunswick, Maine

Reviewer: Michael Daly, Remedial Project Manager U.S. EPA, Region I
Date: 8 May 2009
Respondent: US Navy
Date: 20 June 16, 2009

Comment #	Location	Comment	Response
1	Page 2, Paragraph 2	In addition to lining the excavation with a geo-textile fabric prior to backfilling, a survey of the final excavation limits should be completed with a survey-quality GPS unit.	**Concur.** The final excavation limits will be recorded with a survey-quality GPS unit, or by a Maine licensed surveyor.
2	Page 2, Paragraph 2	As with the backfill used at Site 9, will the backfill for this project have chemical profiles available to confirm it is "clean"? Perhaps the Navy could rely on the same backfill supplier of the Site 9 project and confirm from that supplier that the material will come from the same source as the Site 9 project.	**Noted.** The backfill for the Site 17 relocated soils area excavation will be obtained from the same vendor and source previously used for Site 9.
3	Page 2, Excavation, Transport, & Disposal of Contaminated Soils	Will excavated soils be stockpiled in piles or in roll-offs on-site prior to transport off-base or will they be excavated and directly loaded into trucks for transportation off-base? Will the Navy wait until receipt of confirmatory soil samples to validate the determination that no additional soils beyond the identified 50 cu yds are required to be removed before backfilling the excavation? These details are important and should be discussed in the workplan, especially if soils will be stockpiled and managed on-site for later transport off-base and the excavation will remain open for some period of time prior to backfilling.	**Noted.** Excavated soils will be direct-loaded into transport vehicles for off-site disposal (incineration) in Canada. The US Navy will not wait for results from the confirmatory soil samples because the soils to be excavated were previously moved from Site 17 and temporarily stored at the present location. The relocated soils excavation area itself has no history of pesticide, or other contaminant release(s).
4	Page 2, Excavation, Transport, & Disposal of Contaminated Soils	As with the ash/soil removal effort recently completed at Site 9, the Navy will need to submit to EPA headquarters in Washington, D.C., a notification of intent to export the hazardous waste from this effort to Canada. The notification describes the type and amount of waste, its itinerary, the number of shipments expected, and the period during which shipments will occur. EPA forwards this notification to the government(s) of Canada. The government of the importing country	**Concur.** A "Notification of Intent to Export Hazardous Waste Material to Canada" was issued to US EPA Headquarters to the attention of Mrs. Jean Shaw on 22 April 2009 by the US Navy. US EPA Headquarters has assigned a file number to this notification that is 219/09. The Navy will make sure that consent from Canada is received prior to executing the removal action.

Comment #	Location	Comment	Response
		must consent to the shipment before it may proceed. The U.S. exporter may not allow a shipment to proceed unless EPA has notified it of the consent of the importing country. The exporter must attach the uniform hazardous waste manifest to the shipment (while the waste is traveling within the U.S.), and the acknowledgment of consent from the importing country.	
5	General	A report summarizing the soil removal should be drafted to document the completion of this effort.	**Concur.** A section outlining the information to be included in the closeout report will be added to the work plan addendum as suggested.
END OF COMMENTS			

Responses to Comments
Provided by the State of Maine, Department of Environmental Protection
Draft Addendum – Site 17 Final Work Plan to Investigate and Remove Relocated Soils, 22 April 2009
Naval Air Station, Brunswick, Maine

Reviewer: Ms. Claudia Sait, MEDEP Remedial Project Manager
Date: 12 May 2009
Respondent: US Navy
Date: 20 May 2009June 16, 2009

Comment #	Location	Comment	Response
1	General	It would be helpful if the title included the fact that the analytical results of the test pitting are included in this addendum. (If a separate letter report is still to be issued at a later date then this is not necessary.)	**Noted.** Analytical data from the October 2008 test pit excavations will be included in the completion report for this effort.
2	General	Please update the project organization and responsibilities list to include the subcontractor's key personnel, EPA's and MEDEP's Remedial Project Managers, along with contact information.	**Concur.** The project organization and responsibilities list will be updated as suggested.
3	General	MEDEP supports EPA's request for a closeout report. Please add a section in the workplan that outlines the information that will be included in the close out report.	**Concur.** A section outlining the information to be included in the closeout report will be added to the work plan addendum as suggested.
4	General	PCB analysis is expected to be required for waste characterization for disposal. If the soil sample(s) contain PCBs at a level exceeding 1 ppm, additional site characterization and delineation will need to be conducted to determine if any PCBs remain at this site and to what extent. This investigation must include not only the area where the soils currently reside but the areas from which the soils were originally excavated. PCBs are regulated as hazardous waste in Maine and under Toxic Substances Control Act as well.	**Noted.** The soils being removed were previously excavated from the Site 17 area and do not have a history of PCB release. A separate site investigation to evaluate potential PCB impacts is beyond the scope of the proposed soil removal and disposal action.
5	General	Please add a section on how the existing monitoring wells in the vicinity of the reburied contaminated soil will be protected during the excavation.	**Concur.** A section will be added to the addendum detailing procedures for protection of the existing monitoring well (MW-NASB-098) located in the vicinity of the soil excavation.
6	Page 1, Relocation Soils Identifications, Bullet 1	It is difficult to determine looking at the various figures but if appears that the proposed horizontal extent of the area to be excavated does not include the area to the west where SS07 (DDT5000 µg/kg) and SS08 (DDT6300 µg/kg) exceeded the Preliminary Remedial Goal (PRG) established by the Action Memorandum (1993) or the south central area (SS4 and SS6) where DDT concentrations also exceeded the PRGs of 500 µg/kg. The area to be excavated needs to be expanded to include these areas.	**Noted.** While the PRG for surface soils (i.e., 0-2 feet bgs) is 500 µg/kg, the referenced test pit samples were collected from >2 feet bgs and therefore the subsurface PRG of 135,000 µg/kg applies. Although the test pit soil samples were impacted, none of the reported concentrations exceeded the subsurface PRG. The proposed excavation of relocated soil does not include the areas around SS07; SS08; or SS4 and SS6. The relevant figures will be revised for clarity.

Comment #	Location	Comment	Response
7	Page 2, Soil Sampling	a.) It is unclear why confirmation sampling is proposed for the bottom of the excavation but not for the sidewalls. It would take approximately 6 additional samples to confirm that the horizontal extent had been reached. (The RI samples in the area appear to have been too deep (23' bgs) to capture the buried contaminated soil so those analysis cannot be used in lieu of confirmation samples as proposed in the original work plan response to comments.) b.) Please provide the standard operating procedure for collecting the confirmation samples to MEDEP for review and approval prior to finalizing the workplan addendum.	a.) **Concur.** Six confirmatory sidewall samples will be collected, including two grab samples from the excavation end walls and four grab samples from the sidewalls. The anticipated locations of the sidewall samples will be added to relevant figures in the work plan addendum. b.) **Concur.** A standard operating procedure for collecting soil samples will be included as an attachment to the work plan addendum.
8	Page 2, Excavation, Transportation, and Disposal of Contaminated Soils	a.) The State of Maine Hazardous Waste Management Rules, Chapter 853 requires all hazardous waste transporters to be licensed. MEDEP cannot find any record of Environmental Restoration (ER) LLC of [Glastonbery], CT being licensed with the State of Maine to transport hazardous waste. The Navy needs to make sure that ER has a Federal hazardous waste transporter number also. b.) To meet the Federal and State requirements for air quality, please address how dust suppression will be handled during excavation if it becomes necessary.	a.) **Noted.** The transporters for this effort are subcontractors of Environmental Restoration, LLC (ER) and they are; AmeriTech Environmental Services, Inc (EPA ID No. - MER000500595) and New England Disposal Technologies, Inc. (EPA ID No. - MAC300008059). b.) **Concur.** The dust suppression standard procedures will be added as an attachment to the work plan addendum.
9	Section 3.4	Section 3.4 of the original workplan indicates that the Investigation Derived Waste fluids would be sampled for total pyrethrins, this must be expanded to include DDT and the other pesticides analytes.	**Concur.** Investigation Derived Waste fluids will be sampled for DDT and other pesticide analytes, as required by the disposal facility.
10		If the lined roll offs are going to be stored on site they must be properly labeled. Ideally, the roll off can be stored in a secure (locked) building with secondary containment. If this is not possible construction fencing should be installed around the reburied contaminated soil with room for the decon pad and storage. (If the excavation is to be held open after the excavation construction fence must be installed.	**Noted.** Excavated soils will be direct-loaded into transport vehicles for off-site disposal (incineration) in Canada.
11	Page 4, Applicable or Relevant and Appropriate Requirements, Paragraph 3	The information about California is superfluous and should be removed.	**Noted.** The California List in the Applicable or Relevant and Appropriate Requirements (ARARs) list is a specific component of the US EPA's Resource Conservation Recovery Act (RCRA) regulations and will remain in the work plan addendum. This will be clarified in the work plan addendum.
12	Figure 1	Please add the location of the decontamination pad to the workplan.	**Concur.** The location of the decontamination pad will be added to relevant figures.
13	Table 1	Please add the sample locations to the table.	**Concur.** A Soil Sampling Summary Table will be added to addendum to provide details about the sampling locations.
END OF COMMENTS			

CONCURRENCE LETTERS

From: <Daly.Mike@epamail.epa.gov>
To: <paul.burgio@navy.mil>, <todd.bober@navy.mil>, "Al Easterday" <AEasterda...
CC: "Claudia Sait" <Claudia.B.Sait@maine.gov>, "Catherine Guido" <CGuido@ecc...
Date: 6/3/2009 11:41 AM
Subject: NAS Brunswick: Site 17 Workplan Addendum - Redline/Strikeout Version

Paul Todd & Al,

I've reviewed the subject document you provided us at yesterday's managers meeting. I have no further comments that would effect the execution of this workplan. To re-emphasize a point I made yesterday, the scope of this effort is to remove the finite volume of previously characterized RCRA LDR removal action soils that were reburied south of Avenue B and which thus created the present day situation. The use of the reference geotextile fabric and the clear visual differences between the relocated soils and native soils should make it relatively very easy to remove these relocated soils. Completion of this removal effort will bring to conclusion a resolution of this long-standing issue.

Thanks,

Mike

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

June 5, 2009

Mr. Todd Bober
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Site 17, Workplan to Investigate and Remove Relocated Soils - Addendum
Response to Comments (RTCs)
Naval Air Station, Brunswick, Maine

Dear Mr. Bober:

Pursuant to Section VI of the Naval Air Station, Brunswick, Maine Federal Facility Agreement (Oct 1990), as amended, the Maine Department of Environmental Protection (MEDEP) has reviewed the Navy's responses dated May 21, 2009, to MEDEP's comments, dated May 12, 2009, for draft "Addendum – Site 17 Final Work Plan to Investigate and Remove the Relocated Soils", (April 2009), prepared by ECC. Based on that review and discussions with Navy on June 2, 2009, MEDEP has no additional comments provided that:

- The soil removal is extended 2 feet west of sample locations SS07 and SS08;
- the Tetra Tech's soil sampling standard operating procedures (SOP) for the confirmation soil sampling are included and appropriate sections of SOP are cited in the addendum (paragraph 2 of Jackson Kiker's email dated June 1, 2009);
- text is added to the addendum that the sidewall confirmation soil samples will be taken starting 6 inches above the bottom of the excavation down to the bottom of the hole;
- the pesticide concentrations in remaining soil determined during this removal action as confirmation samples and the earlier testing pitting activity are included in the Remedial Investigation Report;
- the follow sentence "The relocated soils area itself has no history of pesticide, or other contaminant release(s)." in the red line strike out version is deleted (The area roughly 55 feet south of Avenue B had one foot of pesticide contaminated soil removed and the ditch had three feet of soil removed according to the draft final Close Out Report.), and
- the proposed revisions and additions are incorporated into the final report along with regulator comments, responses and this letter..

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., 28 TYSON DR.

BANGOR
106 HOGAN ROAD
BANGOR, ME 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, ME 04103
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Please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: Hard Copy:

File
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Chris Evans-MEDEP
Paul Burgio –BRAC PMO
Al Easterday-ECC
Carol Warren
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Suzanne Johnson-BASCE
Carolyn Lepage-Lepage Environmental
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