

**Abbreviated  
Field Verification Sampling Plan  
for  
Waste Oil Tank No. 5  
Removal Action  
Naval Submarine Base  
New London  
Groton, Connecticut**



**Northern Division  
Naval Facilities Engineering Command  
Contract Number N62472-90-D-1298  
Contract Task Order 0129**

**July 1994**



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C-49-07-4-085

July 11, 1994

Project Number 9594

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Northern Division (Code 1823)  
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Mail Stop 82  
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Reference: CLEAN Contract N62472-90-D-1298  
Contract Task Order No. 129

Subject: Draft Abbreviated Field Verification Sampling Plan  
OT5 Removal Action  
Naval Submarine Base New London, Groton, Connecticut

Dear Mr. Helland:

Please find attached three copies of the draft Abbreviated Field Verification Sampling Plan for the Waste Oil Tank No. 5 (OT5) Removal Action. Please call me with your comments or fax marked-up document if you wish to have this document changed in any way before it is issued in its final version.

Very truly yours,

A handwritten signature in black ink, appearing to read "JL Glorieux", is written over a horizontal line.

Jean-Luc Glorieux, P.E.  
Manager, Task 10

JLG/jlg  
Attachment

cc: Mr. Roger Boucher, NORTHDIV (letter only)  
Lt. Pat Rios, ROICC, SUBASE NLON  
Lt. Cdr. Mark Whitson, ROICC, SUBASE NLON (letter only)  
Mr. Matt Cochran, Halliburton NUS, Pittsburgh  
Mr. John Trepanowski, Halliburton NUS, Wayne  
Ms. Debra Wroblewski, Halliburton NUS, Pittsburgh (letter only)  
File 9594

**ABBREVIATED FIELD VERIFICATION SAMPLING PLAN  
FOR  
WASTE OIL TANK NO. 5 REMOVAL ACTION  
NAVAL SUBMARINE BASE - NEW LONDON  
GROTON, CONNECTICUT**

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

**Submitted to:  
Northern Division  
Environmental Branch, Code 1823  
Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop #82  
Lester, Pennsylvania 19113-2090**

**Submitted by:  
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**CONTRACT NUMBER N62472-90-D-1298  
CONTRACT TASK ORDER 0129**

**July 1994**

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## **1.0 INTRODUCTION AND PROJECT BACKGROUND**

### **1.1 INTRODUCTION**

The field work described in this plan will be performed under Task 10 of Contract Task Order (CTO) Number 129 of Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62472-90-4-1298.

Task 10 of CTO No. 129 is for the removal and disposal of PCB-contaminated sludge at Waste Oil Tank No. 5 (OT#5) of the Naval Submarine Base - New London (NSB-NLON) in Groton Connecticut. This Abbreviated Field Verification Sampling Plan describes the necessary sampling and analysis to ensure that the containers currently used for on-site storage of the OT#5 sludge have been properly decontaminated.

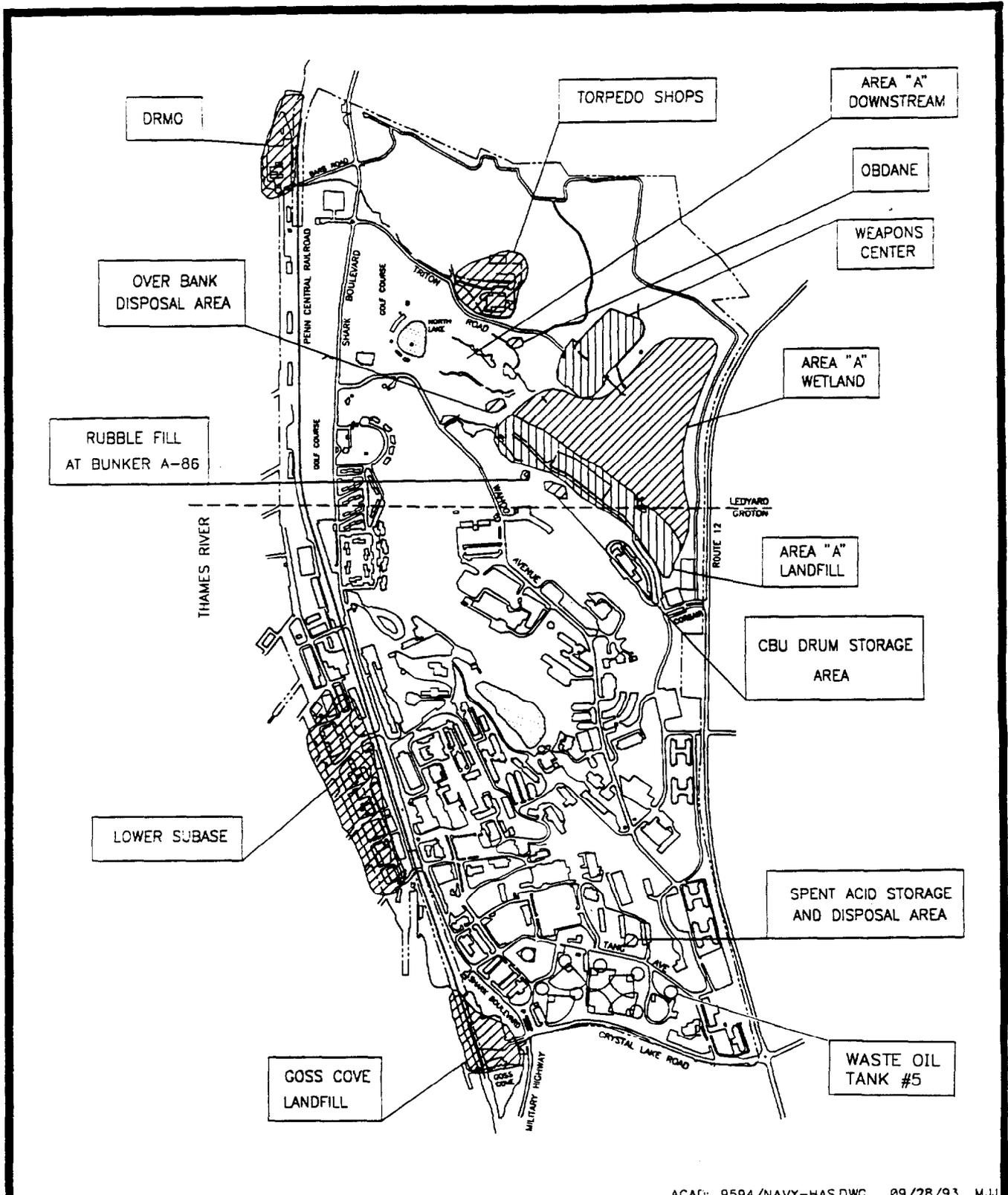
### **1.2 PROJECT BACKGROUND**

OT#5 is located in the southern portion of NSB-NLON, immediately north of Crystal Lake Road and between Sculpin Avenue and Tang Avenue. Site location is shown on Figure 1-1. OT#5 is a concrete underground storage structure approximately 112 feet in diameter and 11 feet deep and is buried about 5 feet below grade. The reported capacity of OT#5 is about 810,000 gallons. OT#5 was built in the 1940s and initially used for fuel storage. Ten to fifteen years ago, the tank was converted for waste storage, predominantly bilge water. OT#5 was eventually taken out of service and most of its contents, including floating product, water, and sludge were removed and disposed of in mid-1993.

Some of the waste accumulated as a result of these closure activities are currently stored on site in two (2) 20,000-gallon capacity frac trailers and two (2) 20-cubic yards capacity roll-off containers.

The majority of the waste stored on site is an oily sludge removed from the bottom of OT#5. This sludge is fairly viscous but pumpable and has an average specific gravity of about 10 pounds per gallon. The main contaminants of concern in the OT#5 bottom sludge are Polychlorinated Biphenyls (PCBs) with concentrations which may reach in excess of 1,000 mg/kg.

Other wastes stored on site include spent decontamination fluids, waste diaper-like wipe cloths, and discarded personnel protection equipment (PPE) used during the OT#5 closure activities. The spent decontamination fluids have an average specific gravity of about 8 pounds per gallon and are highly



ACAD: 9594/NAVY-HAS.DWG 09/28/93 MJJ

INSTALLATION RESTORATION STUDY  
 NAVAL SUBMARINE BASE - NEW LONDON  
 GROTON, CT

SOURCE: Naval Submarine Base  
 Existing Conditions  
 April 1985  
 Loureiro Engineering Associates

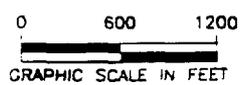


FIGURE 1-1  
 SITE LOCATION MAP  
 ATLANTIC ENVIRONMENTAL SERVICES, INC.

contaminated. The oil content of these fluids may be as high as 70 to 80 percent and their PCBs concentrations may be similar to those of the OT#5 bottom sludge.

The approximate contents of the two frac trailers and two roll-off containers are as follows:

Storage Vessel	Contents
Frac Trailer No.1	19,000 Gallons Bottom Sludge
Frac Trailer No.2	6,000 Gallons Decontamination Fluid
Roll-Off Container No.1	20,000 Pounds Bottom Sludge + Waste Wipe Cloths+Discarded PPE
Roll-Off Container No.2	20,000 Pounds Bottom Sludge + Waste Wipe Cloths+Discarded PPE

### 1.3 OBJECTIVE AND SAMPLING STRATEGY

The objective of the work described in this Abbreviated Field Verification Sampling Plan is to ensure that the two frac trailers and two roll-off containers described above have been properly decontaminated after their current contents have been removed for off-site incineration. Wipe sampling will be collected from the inside surfaces of these containers following their decontamination and the analytical data generated from this sampling will be used to demonstrate that these surfaces do not exceed the PCB clean-up standard of  $10 \mu\text{g}/100 \text{ cm}^2$  as established by 40 CFR §761.125.

### 1.4 PLAN FORMAT

Section 1.0 of This Abbreviated Field Verification Sampling Plan is this brief introduction and description of project background. Section 2.0 describes the procedures and methods that will be used to implement the field work. Section 3.0 contains a site-specific sampling plan. Sections 4.0 and 5.0 address field measurements and the keeping of records. A site management plan is included in Section 6.0. Appendices A and B provide field activities forms and standard sampling operating procedures, respectively.

## **2.0 FIELD OPERATIONS**

### **2.1 MOBILIZATION/DEMOBILIZATION**

Following approval of this Abbreviated Field Verification Sampling Plan, Halliburton NUS will complete laboratory specifications, obtain a laboratory subcontractor, and prepare for mobilization. All Halliburton NUS field team members will review this plan as well as the site-specific Removal Action Health and Safety Plan (RAHSP) prepared by the Removal Action Subcontractor.

The Halliburton NUS Field Operations Leader (FOL) will coordinate the mobilization of all equipment and materials required for field sampling. As complete self-contained wipe sampling kits will be provided by the laboratory subcontractor and as health and safety monitoring will be performed by the Removal Action Subcontractor, it is anticipated that only personal protective equipment (PPE) will be required for verification sampling. The required equipment and material will be packed at Halliburton NUS central warehouse in Pittsburgh, Pennsylvania and shipped to NSB-NLON. Only one such shipment is anticipated. After completion of field activities, the Halliburton NUS FOL will demobilize the sampling equipment and ship it back as well as any leftover materials to the Pittsburgh warehouse.

### **2.2 HEALTH AND SAFETY**

All field sampling activities for this project will be conducted in accordance with the site-specific Removal Action Health and Safety Plan (RAHSP) prepared by the Removal Action Subcontractor. Prior to any sampling, Halliburton NUS field personnel will familiarize themselves with the Removal Action Subcontractor's site-specific RAHSP and receive site-specific health and safety training from the Removal Action Subcontractor's Site Safety and Health Officer (SSHO).

### **2.3 WIPE SAMPLING**

A total of fourteen (14) wipe environmental samples will be collected following the decontamination of the frac trailers and roll-off containers. Five (5) wipe samples will be collected from the inside surfaces of each of the two frac trailers and two (2) wipe samples will be collected from the inside surfaces of each of the two roll-off containers. The purpose of this sampling is to demonstrate that decontamination has removed PCBs from the inside surfaces of the frac trailers and roll-off containers down to less than 10  $\mu\text{g}/100\text{ cm}^2$  as specified by 40 CFR §761.125.

For each of the frac trailers, one wipe sample will be collected from each inside wall and from the bottom of the trailer. Each wipe sample will be collected in a boxed pattern, i.e., each wipe sample will be a composite of five wipes, each 100 square centimeters in area, collected from each corner and from the center of the panel being sampled.

For each of the roll-off containers, one wipe sample will be collected from the inside walls and one from the bottom of the container. The inside wall samples will be a composite of four wipes, each 100 square centimeters in area, collected from the center of each wall. The bottom samples will be collected in a boxed pattern, i.e., each sample will be a composite of five wipes, each 100 square centimeters in area, collected from each corner and from the center of the container bottom.

It should be noted that the above number of samples is based on the anticipation that only one verification wipe sample will be required for a given surface. If the first verification sample indicates that the sampled surface does not meet the 10  $\mu\text{g}/100 \text{ cm}^2$  PCB clean-up standard, an additional verification sample will be required at the same location after further decontamination has been performed by the removal Action Subcontractor.

All wipe samples will be collected in accordance to Halliburton NUS Standard Operating Procedure for wipe sampling which is included in Appendix B.1.

One collocated field duplicate wipe sample will also be collected. This field duplicate wipe sample and one wipe medium blank will be analyzed for quality assurance/quality control (RA/RC) purposes. These samples are further discussed in Section 3.5.

## **2.4 DECONTAMINATION**

Any equipment as may be used for verification sampling will be decontaminated prior to, during, and after sampling. Personal decontamination requirements are addressed in the Removal Action Subcontractor's site-specific RAHSP.

## **2.5 WASTE HANDLING**

All disposable sampling equipment and PPE will be placed in onsite containers provided by the Removal Action Subcontractor. The Removal Action Subcontractor will provide for the disposal of all wastes.

## 3.0 ENVIRONMENTAL SAMPLING

### 3.1 SAMPLING ANALYSIS SUMMARY

Samples collected from the frac trailers and roll-off containers will be submitted for the laboratory analyses presented in Tables 3-1 and 3-2. These tables indicate the analytical parameters, analytical methods, preservation methods, and holding times for each sample.

As noted in Section 2.3, the number of samples indicated on Tables 3-1 and 3-2 is based on the anticipation that only one round of verification sampling will be required for each surface to be sampled. If analytical results from the first round of verification sampling indicates that some of the sampled surfaces failed to meet the 10  $\mu\text{g}/100 \text{ cm}^2$  PCB clean-up standard, additional samples will be required.

### 3.2 SAMPLING PROCEDURES

All sampling will be performed in accordance with the procedures described in Section 2.0 and Appendix B of this Abbreviated Field verification Sampling Plan.

### 3.3 SAMPLE HANDLING

Sample handling includes the field-related requirements for the selection of sample containers, preservatives, allowable holding times, and requested analyses. In addition sample handling also addresses sample identification, packaging, and shipping.

Sample containers and preservatives will be selected in accordance with U.S. EPA User's Guide to the Contract Laboratory Program (U.S. EPA, December 1986) and the Federal Register (U.S. EPA, October 26, 1984). Table 3-2 provides a summary of sampling handling requirements.

#### 3.3.1 Sampling Identification System

Each sample collected will be assigned a unique sample tracking number. This sample tracking number will consist of a three-segment alpha-numeric code that identifies the sample medium, location, and QC designation, as required.

TABLE 3-1

**ANALYTICAL PROGRAM SUMMARY  
WASTE OIL TANK NO. 5 REMOVAL ACTION  
NSB NLON, GROTON, CONNECTICUT**

Media	Analysis	Method	NEESA DQO Level	Number of Samples <sup>1</sup>
Wipe	PCB	40 CFR 7.2.2 (equiv.); SW\8080	C	16

<sup>1</sup> The tally 16 represents a total of 13 five-wipe composite samples, plus 3 four-wipe composite samples (including one collocated field duplicate and one wipe medium blank.)

TABLE 3-2

**SAMPLE HANDLING REQUIREMENTS  
WASTE OIL TANK NO. 5 REMOVAL ACTION  
NSB NLON, GROTON, CONNECTICUT**

Media	Analysis	Bottleware <sup>1</sup>	Preservation	Holding Time
Wipe	PCB	4 oz. glass jar with teflon-lined lid	Cool to 4°C	7 days extract; 40 days analysis

- <sup>1</sup> All bottleware must meet ICHM Series 300 cleanliness criteria or equivalent. All solvents must be certified to be >99.95% pure (i.e., "free" of the contaminants of concern). Certification of bottleware cleanliness and solvent purity must be included in the bottleware shipment.

Any other pertinent information regarding sample identification will be recorded in the field log books.

The alphanumeric coding to be used for sample identification will be as follows:

(Medium & Location)	-	(Sample Identifier)	-	(QC Designation)
4 symbols	-	4 symbols	-	1 symbol

Medium:

WS = Wipe Sample

Location:

F1 = Frac Trailer No. 1  
F2 = Frac Trailer No. 2  
R1 = Roll-Off Container No. 1  
R2 = Roll-Off Container No. 2

Sample Identifier:

The first two symbols of the identifier will be as follows:

NW = North Wall (frac trailers only)  
SW = South Wall (frac trailers only)  
WW = West Wall (frac trailers only)  
EW = East Wall (frac trailers only)  
WL = Walls (roll-off containers only)  
BM = Bottom (frac trailers and roll-off containers)

The last two symbols of the Sample Identifier will be the sample number at that location, i.e., 01 for first sample collected at a particular location, 02 for the second (first repeat) sample etc.

QC Sample Designation:

D = Duplicate  
F = Field Blank

For example, the first wipe sample collected from the west wall of frac trailer No. 1 will be identified as:

WPF1-WW01

The second wipe sample collected from the bottom of roll-off container No. 2 will be identified as:

WSR2-BM02

As noted in Section 2.3, it is likely that only one wipe sample will be taken at each location and, accordingly, the last two symbols of the Sample Identifier will most probably be limited to 01.

All QC samples will be assigned a sequential sample number. A designation which blinds the sample's QC identity will be used for all field duplicates. The field duplicates (D) samples will be collected from the same location.

Procedures for the preparation of samples and tags are provided in Section 5.2 of Halliburton NUS SOP SA-6.1 which is included as Appendix B.2.

### **3.3.2 Sample Packaging and Shipping**

Samples will be packaged and shipped in accordance with Halliburton NUS SOP SA-6.2 which is included as Appendix B.3. The Halliburton NUS FOL will be responsible for completion of the following forms:

- Sample Labels
- Chain-of-Custody Forms
- Appropriate labels applied to shipping coolers
- Chain-of-Custody Labels
- Express Mail Air Bills

### **3.4 SAMPLE CUSTODY**

Custody of samples must be maintained and documented at all times. Chain-of-custody begins with the collection of the samples in the field. Section 5.3 of Halliburton NUS SOP SA-6.1, which is included as Appendix B.2, provides a description of the chain-of-custody procedures to be followed. A sample chain-of-custody form is attached in Appendix A.

### 3.5 QUALITY CONTROL SAMPLES

In addition to regular calibration of field equipment and appropriate documentation, QC samples will be collected or generated during environmental sampling activities. QC samples pertinent to this effort include field duplicates and field blanks. Each type of field QC sample is defined as follows:

- Field Duplicates: Field duplicates for wipe samples are collocated. Collocated samples are obtained from two locations positioned immediately beside each other, serving, in essence, as a duplicate location. Duplicates are obtained during a single act of sampling and are used to assess the overall precision of the sampling and analysis program. Ten percent of all samples for each media shall be field duplicates. Duplicates are analyzed for the same parameters as the associated environmental samples. Per the Navy's request, one field duplicate will be collected for this effort.
- Field Blanks: Field blanks for wipe samples consist of preparing a wipe medium and containerizing it for analysis without contacting it with a sampling surface. Field blanks are used to confirm the analyte-free condition of disposable/dedicated sampling materials or the effectiveness of decontamination procedures (where applicable). Per Navy's guidance, one wipe medium blank will be analyzed for this effort.

## 4.0 FIELD MEASUREMENTS

It is assumed that no field measurements or monitoring will be taken during performance of the verification sampling since a monitoring program will be instituted by the Removal Action Subcontractor. However, if monitoring for health and safety is necessary, instruments used in the field will be calibrated according to the procedures described below.

### 4.1 EQUIPMENT CALIBRATION

Several monitoring instruments which may be used during field activities include:

- HNu photoionization indicator device
- OVA flame ionization indicator device
- Carbon monoxide meter

These instruments will be calibrated daily or according to the manufacturer's operating manual.

Calibration will be documented on an equipment calibration log. A sample calibration log is attached in Appendix A. During calibration, an appropriate maintenance check will be performed on each piece of equipment. If damaged or defective parts are identified during the maintenance check and it is determined that the damage could have an impact on the instrument's performance, the instrument will be removed from service until the defective parts are repaired or replaced.

### 4.2 EQUIPMENT MAINTENANCE

Measuring equipment used in environmental monitoring or analysis and test equipment used for calibration and maintenance shall be controlled by established procedures. Measuring equipment shall have an initial calibration and shall be recalibrated at scheduled intervals against certified standards. Equipment will be calibrated periodically.

Halliburton NUS maintains a large inventory of sampling and measurement equipment. In the event that failed equipment cannot be repaired, replacement equipment will be shipped to the site by overnight express carrier to minimize downtime.

## **5.0 RECORD KEEPING**

In addition to chain-of-custody records, certain standard forms will be completed for sample description and documentation. These shall include sample log sheets, excavation logs, and logbooks. These forms are attached in Appendix A.

A bound/weatherproof field notebook shall be maintained by the field operations leader (FOL). All information related to sampling or field activities will be recorded in the field notebook. This information will include, but is not limited to, sampling time, weather conditions, unusual events, field measurements, descriptions of photographs, etc.

A bound/weatherproof site logbook shall be maintained by the Halliburton NUS FOL. The requirements of the site logbook are outlined in Sections 5.0 of Halliburton NUS SOP SA-6.3 which is included as Appendix B.4. This book will contain a summary of the day's activities and will reference the field notebooks when applicable.

At the completion of field activities, the Halliburton NUS FOL shall submit to the Halliburton NUS Project Manager all field records, data, field notebooks, logbooks, chain-of-custody receipts, sample log sheet, drilling logs, daily logs, etc.

## 6.0 SITE MANAGEMENT

### 6.1 BASE SUPPORT

The CLEAN Remedial Project Manager (RPM) is:

Brian Helland  
Northern Division  
Naval Facilities Engineering Command  
Code 1823  
10 Industrial Highway  
Lester, Pennsylvania 19113-2090  
Tel: (610) 595-0567 - Ext.124  
Fax: (610) 595-0555

The NSB-NLON Point of Contact is:

Lt. Pat Rios  
ROICC - Building 135  
Naval Submarine Base, New London  
Groton, Connecticut 06349-5100  
Tel: (203) 449-4563  
Fax: (203) 449-4565

The Removal Action Subcontractor principal is:

Mr. William Gerardi  
Site Remediation Services, Inc.  
P.O. Box 967  
10 Stoughton Road  
East Windsor, Connecticut 06088  
Tel: (203) 623-8179  
Fax: (203) 627-5719

Throughout the duration of the verification sampling, the Removal Action Subcontractor will provide the following services:

- Provide field office space for Halliburton NUS personnel assigned to the verification sampling task.
- Provide storage for Halliburton NUS sampling equipment and PPE.
- Dispose of all waste generated as a result of the sampling activities in accordance with applicable state and Federal regulations.
- Provide decontamination facilities for Halliburton NUS personnel and equipment.

## **6.2 CONTINGENCY PLAN**

In the event of problems which may be encountered during the sampling activities, the Halliburton NUS Project Manager will be notified immediately, followed by the NSB-NLON Point of Contact. The Halliburton NUS Project Manager will determine a course of action so as to not interfere with the schedule or budget. All contingency plans will be approved by the NSB-NLON Point of Contact and the CLEAN RPM before being enacted.

**APPENDIX A**

**FORMS**

# SAMPLE LOG SHEET



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon / Pond
- Other \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

Case # \_\_\_\_\_

By \_\_\_\_\_

Project Site Name \_\_\_\_\_ Project Site Number \_\_\_\_\_

NUS Source No. \_\_\_\_\_ Source Location \_\_\_\_\_

Sample Method:	Composite Sample Data		
	Sample	Time	Color / Description
Depth Sampled:			
Sample Date & Time:			
Sampled By:			
Signature(s):			
<b>Type of Sample</b> <input type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
	<b>Sample Data</b>		
	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
Analysis:	<b>Observations / Notes</b>  _____ _____ _____ _____ _____ _____ _____ _____		
	Organic	Inorganic	
Traffic Report #			
Tag #			
AB #			
Date Shipped			
Time Shipped			
Lab			
Volume			





## **APPENDIX B**

### **STANDARD OPERATING PROCEDURES**

- B.1 Wipe Sampling**
- B.2 Procedure No. SA-6.1, Sec. 5.0: Sample Identification & Chain-of-Custody**
- B.3 Procedure No. SA-6.2, Sec. 5.0: Sample Packaging and Shipping**
- B.4 Procedure No. SA-6.3, Sec. 5.0: Site Logbook**

## **APPENDIX B.1**

### **WIPE SAMPLING STANDARD OPERATING PROCEDURE**

# SOP: WIPE SAMPLING

PAGE 1 of 8

Rev. 0: 4/94 DAS;

Rev. 1: 7/94 DAS

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## 1.0 PURPOSE

The purpose of this procedure is to describe the methods, materials, and equipment necessary to perform wipe sampling.

Wipe sampling procedures and subsequent laboratory analysis are conducted to determine the presence of (or verify the absence of) surface contamination.

This procedure is to be used for obtaining samples suitable for subsequent laboratory analysis of various organic and inorganic compounds.

This procedure is applicable to the sampling of various surfaces (i.e., walls, floors) which are relatively non-porous; and various surface material types (e.g., concrete, painted).

For porous surfaces (e.g., unsealed concrete, brick, asphalt, wood), destructive sampling (i.e., samples obtained by chipping or drilling) may be required.

## 2.0 SCOPE

This Standard Operating Procedure (SOP) is intended to serve as general guidance. Considerations such as sampling strategy, solvent, wipe media, and quality control procedures are addressed.

Techniques and recommended numbers of samples obtained will vary based upon the application. Regulatory programs (such as RCRA) may have specific requirements governing wipe sampling protocol. Where such guidance is applicable, the wipe sampling protocols detailed therein, supersede this procedure.

## 3.0 GLOSSARY

Ampule - small, disposable, sealed (all-in-one), glass vial (usually having a tapered neck), for which the contents are accessed by breaking the vial open.

Background Sample - sample obtained (for reference purposes) at a location suspected to be free of contamination, and thus representative of naturally occurring conditions.

# SOP: WIPE SAMPLING

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Rev. 0: 4/94 DAS;

Rev. 1: 7/94 DAS

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Collocated - two locations positioned immediately beside each other, serving, in essence, as a duplicate location.

Composited - a mixture or combination of two or more aliquots of solid material which is then processed together, collectively, as a singular unit.

Soluble - the ability or tendency of a substance to mix or blend uniformly with another; the ability of a material to be dissolved by the chosen solvent.

## 4.0 RESPONSIBILITIES

Field Team Leader (FTL) - retains overall responsibility for the proper acquisition, documentation, storage, packaging, and shipment of environmental wipe samples and associated quality control samples. The FTL (or designee) is responsible for interfacing with the analytical laboratory as needed.

Sampler - directly responsible for the proper acquisition, documentation, labeling, preservation, storage and custody of all samples personally collected, until properly released to another party for packaging and/or transport.

Analytical Laboratory - responsible for the provision of all wipe media, solvent, and incidental materials required to acquire wipe samples for subsequent submission to the laboratory for analysis.

## 5.0 PROCEDURES

### 5.1 Wipe Media

The wipe media is the solid material (e.g., filter paper, gauze) used to contact the sampling surface for purposes of transferring contaminants from the sampling surface to the wipe media.

The selection of appropriate wipe media material is contingent upon the texture of surface to be sampled (i.e., rough, smooth), and the contaminants that will be analyzed (i.e., organic, inorganic). The media pieces may be round or square, usually sized between 5 cm and 15 cm. Physical and technical concerns as well as laboratory policy dictate the type of wipe media provided.

# SOP: WIPE SAMPLING

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Rev. 0: 4/94 DAS;

Rev. 1: 7/94 DAS

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## 5.2 Solvent

The solvent is the liquid phase used to transport the contaminants from the sampling surface to the wipe media.

The contaminants of concern must be soluble in the solvent selected. Health & Safety concerns will also dictate solvent selection.

Typically, analyte-free water (example - used to sample inorganic particulates), or a specific solvent (example - hexane, used to sample for PCBs) is used. Wipe media may be provided immersed in solvent (excess solvent is shaken off before use), or the solvent may be provided separately in sealed ampules or squirt bottles (media is wetted prior to use).

The solvent used must be of an analytical grade certified to be free of the contaminants of concern.

## 5.3 Sampling Strategy

### 5.3.1 Random Wipe Sampling

Random sampling is conducted without measuring exact distances between sampling points, however, consistency in pattern and surface area wiped is strictly maintained.

For pattern, a boxed configuration is suggested. In the boxed pattern, areas in approximately the two opposing upper and two opposing lower corners of the sampling surface are wiped, as well as the center area. Hence, a total of five wipe samples are obtained per surface sampled.

The wipe samples obtained can be analyzed individually, or composited and analyzed collectively. At each location, care is taken to physically wipe a consistent amount of surface area (corporate policy is to wipe 100 cm<sup>2</sup>; that is, an area 10 cm X 10 cm.) A stencil cut-out (template) is used to obtain this consistency (reference Section 5.4).

In the event that several wipe samples must be obtained from a particular location (i.e., to accommodate multiple fraction

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analyses - SVOCs, PCBs, metals), these wipes must be collocated as described in Section 5.6.2.

## 5.3.2 Zoned Wipe Sampling

Extremely large surface areas can first be divided into zones, then randomly sampled as described above.

## 5.3.3 Grid (Coordinate) System Wipe Sampling

The grid (coordinate) system of sample location technique (analogous to that employed in surface soil sampling), may be used to conduct wipe sampling. This technique designates sampling areas by distances measured from two ordinate directions. The wipe sample is then obtained by centering the wipe area at the point of the ordinates' intersection. At each sampling location thus designated, care must be taken to physically wipe a consistent amount of surface area (i.e., usually 100 cm<sup>2</sup>). A stencil cut-out (template) is used to obtain this consistency (reference Section 5.4). Usually samples obtained by using an ordinate system are analyzed individually, rather than composited with other wipes taken at other ordinate locations.

In the event that several wipe samples must be obtained from a particular location (i.e., to accommodate multiple fraction analyses - SVOCs, PCBs, metals), these wipes must be collocated as described in Section 5.6.2.

## 5.4 Sample Acquisition

Wipe samples are to be obtained using the procedures described below:

- Using a clean, impervious chemical protective disposable glove (such as a surgeon's glove), remove a piece of wipe media from its container. The glove must be changed if it touches the surface being wiped. A new glove should be used for each sample obtained to avoid cross-contamination.
- As applicable, either shake off the excess solvent from the piece of wipe media, or wet the medium thoroughly

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(but not to excess) with the solvent provided. The wipe medium should not be dripping.

- Using a firm touch, use the moistened wipe medium to thoroughly wipe the area within the pre-placed template (reference Section 5.3). If the area wiped is not flat, care must be taken to wipe any crevices or depressions.
- Without allowing the wipe medium to contact any other surface, fold it in half (with the exposed side in), then in half again, and place the medium into a clean glass jar.

Seal the glass sample jar securely, document the sample acquisition appropriately in the field notebook, and label the sample container with the appropriate information.

Preserve and store the sample in the manner described in Section 5.5.

- Thoroughly rinse the template with solvent, and wipe dry with a disposable wiping cloth.
- Repeat steps outlined above until all samples are obtained.

### 5.5 Sample Documentation, Preservation, Storage, Packaging, Shipment

Sample documentation, preservation, storage, packaging, and shipment are to be conducted as described above and in accordance with the protocols outlined in the established corporate SOPs governing these tasks (i.e., SOPs SA-6.1, SA-6.2, SF-1.2).

### 5.6 Quality Control Procedures

The acquisition and handling techniques described in previous sections will ensure representative samples, free of field-induced and cross-contamination. In addition, the following quality control procedures are to be observed (when appropriate to the

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application).

## 5.6.1 Quality Control Blanks

Blanks are prepared by wetting the wipe medium (reference Section 5.4) and placing it immediately into a clean glass jar without contacting it with a sampling surface. Blanks are to be documented, preserved, stored, packaged, and shipped in the same manner as the associated environmental samples. Typically, a minimum of one blank is collected per wipe sampling event. One blank should also be collected per each lot change of wipe media and/or solvent. The frequency with which blanks are to be collected are detailed in the applicable regulatory guidance and the project planning documents.

## 5.6.2 Field Duplicates

Field duplicates consist of collocated samples. The number of field duplicates obtained is dictated by the applicable regulatory guidance and is detailed in the project planning documents. Usually, field duplicates are obtained at a rate of 5% or 10%.

## 5.6.3 Background Samples

As applicable, background samples may be obtained. The number and location of background samples is detailed in the project planning documents.

## 6.0 REFERENCES

U.S. EPA, 1987. Wipe Sampling and Double Wash/Rinse Cleanup. John H. Smith, Ph. D, Chief, PCB Disposal Section, Chemical Regulation Branch, U.S. EPA.

U.S. EPA, 1986. Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup. EPA-560/5-86-017.

U.S. EPA, 1985. Verification of PCB Spill Cleanup by Sampling and Analysis. EPA-560/5-85-026.

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## 7.0 ATTACHMENTS

A: 10 cm<sup>2</sup> template outline.

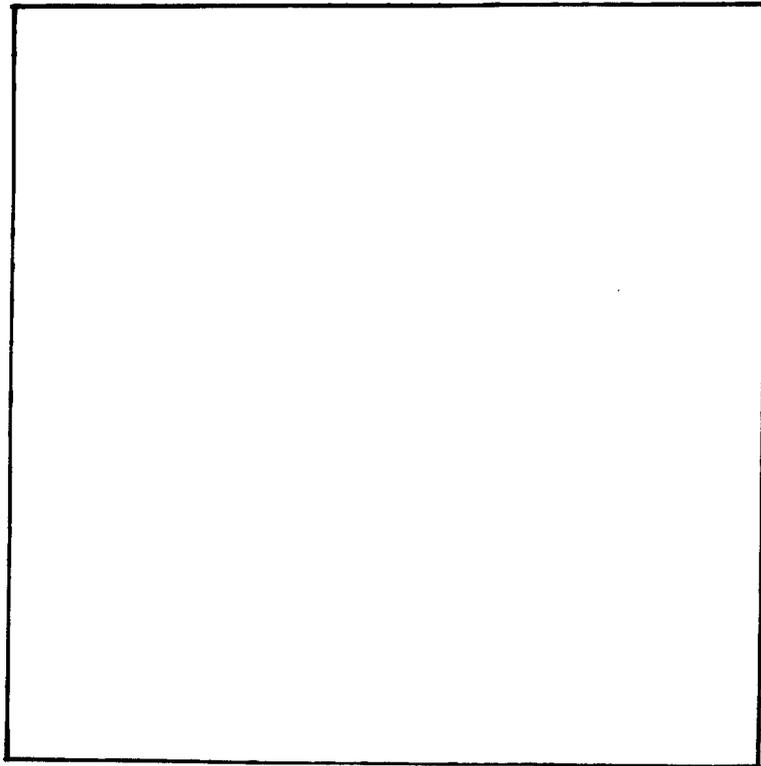
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Attachment A



**APPENDIX B.2**

**PROCEDURE NO. SA-6.1, SECTION 5.0:  
SAMPLE IDENTIFICATION & CHAIN-OF-CUSTODY**

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#### ~~4.0 RESPONSIBILITIES~~

~~Field Operations Leader - Responsible for determining that chain-of-custody procedures are implemented up to and including release to the shipper.~~

~~Field Samplers - Responsible for initiating the Chain-of-Custody Record and maintaining custody of samples until they are relinquished to another custodian, to the shipper, or to the common carrier.~~

~~Remedial Investigation Leader - Responsible for determining that chain-of-custody procedures have been met by the sample shipper and analytical laboratory.~~

#### 5.0 PROCEDURES

##### 5.1 OVERVIEW

The term "chain-of-custody" refers to procedures which ensure that evidence presented in a court of law is what it is represented to be. The chain-of-custody procedures track the evidence from the time and place it is first obtained to the courtroom and, secondly, provide security for the evidence as it is moved and/or passes from the custody of one individual to another.

Chain-of-custody procedures, recordkeeping, and documentation are an important part of the management control of samples. Regulatory agencies must be able to provide the chain of possession and custody of any samples that are offered for evidence, or that form the basis of analytical test results introduced as evidence. Written procedures must be available and followed whenever evidence samples are collected, transferred, stored, analyzed, or destroyed.

##### 5.2 SAMPLE IDENTIFICATION

The method of identification of a sample depends on the type of measurement or analysis performed. When in-situ measurements are made, the data are recorded directly in bound logbooks or other field data records, with identifying information.

###### 5.2.1 Sample Label

Samples, other than in-situ measurements, are removed and transported from the sample location to a laboratory or other location for analysis. Before removal, however, a sample is often divided into portions, depending upon the analyses to be performed. Each portion is preserved in accordance with the Sampling Plan. Each sample container is identified by a sample label (see Attachment B). Sample labels are provided by the PMO. The information recorded on the sample label includes:

- **Project:** EPA Work Assignment Number (can be obtained from the Sampling Plan).
- **Station Location:** The unique sample number identifying this sample (can be obtained from the Sampling Plan).
- **Date:** A six-digit number indicating the day, month, and year of sample collection; e.g., 12/21/85.
- **Time:** A four-digit number indicating the 24-hour time of collection (for example: 0954 is 9:54 a.m., and 1629 is 4:29 p.m.).
- **Medium:** Water, soil, sediment, sludge, waste, etc.

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- **Concentration:** The expected concentration (i.e., low, medium, high).
- **Sample Type:** Grab or composite.
- **Preservation:** Type of preservation added and pH levels.
- **Analysis:** VOA, BNAs, PCBs, pesticides, metals, cyanide, other.
- **Sampled By:** Printed name of the sampler.
- **Case Number:** Case number assigned by the Sample Management Office.
- **Traffic Report Number:** Number obtained from the traffic report labels.
- **Remarks:** Any pertinent additional information.

Using just the work assignment number of the sample label maintains the anonymity of sites. This may be necessary, even to the extent of preventing the laboratory performing analysis from knowing the identity of the site (e.g., if the laboratory is part of an organization that has performed previous work on the site).

#### 5.2.2 Sample Identification Tag

A Sample Identification Tag (Attachment F) must also be used for samples collected for CLP (Contract Laboratory Program) analysis. The Sample Identification Tag is a white, waterproof paper label, approximately 3-by-6 inches, with a reinforced eyelet, and string or wire for attachment to the neck of the sample bottle. The Sample Tag is a controlled document, and is provided by the regional EPA office. Following sample analysis, the Sample Tag is retained by the laboratory as evidence of sample receipt and analysis.

The following information is recorded on the tag:

- **Project Code:** Work Assignment Number.
- **Station Number:** The middle portion of the Station Location Number, (between the hyphens).
- **Month/Day/Year:** Same as Date on Sample Label.
- **Time:** Same as Time on Sample Label.
- **Designate - Comp/Grab:** Composite or grab sample.
- **Station Location:** Same as Station Location on Sample Label.
- **Samplers:** Same as Sampled By on Sample Label.
- **Preservative:** Yes or No.
- **Analyses:** Check appropriate box(es).

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- Remarks: Same as Remarks on Sample Label (make sure the Case Number and Traffic Report numbers are recorded).
- Lab Sample Number: For laboratory use only.

The tag is then tied around the neck of the sample bottle.

If the sample is to be split, it is aliquoted into similar sample containers. Identical information is completed on the label attached to each split.

Blank, duplicate, or field spike samples shall not be identified as such on the label, as they may compromise the quality control function. Sample blanks, duplicates, spikes, and splits are defined in Procedure SA-6.6.

### 5.3 CHAIN-OF-CUSTODY PROCEDURES

After collection, separation, identification, and preservation, the sample is maintained under chain-of-custody procedures until it is in the custody of the analytical laboratory and has been stored or disposed of.

#### 5.3.1 Field Custody Procedures

- Samples are collected as described in the site-specific Sampling Plan. Care must be taken to record precisely the sample location and to ensure that the sample number on the label matches the sample log sheet and Chain-of-Custody Record exactly.
- The person undertaking the actual sampling in the field is responsible for the care and custody of the samples collected until they are properly transferred or dispatched.
- When photographs are taken of the sampling as part of the documentation procedure, the name of the photographer, date, time, site location, and site description are entered sequentially in the site logbook as photos are taken. Once developed, the photographic prints shall be serially numbered, corresponding to the logbook descriptions.
- Sample labels shall be completed for each sample, using waterproof ink unless prohibited by weather conditions, e.g., a logbook notation would explain that a pencil was used to fill out the sample label because a ballpoint pen would not function in freezing weather.

#### 5.3.2 Transfer of Custody and Shipment

Samples are accompanied by a Chain-of-Custody Record Form. Chain-of-Custody Record Forms used in EPA Regions I-IV are shown in Attachments A through D. The appropriate form shall be obtained from the EPA Regional Office. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the Record. This Record documents sample custody transfer from the sampler, often through another person, to the analyst in the laboratory. The Chain-of-Custody Record is filled out as follows:

- Enter header information (project number, samplers, and project name -- project name can be obtained from the Sampling Plan).
- Sign, date, and enter the time under "Relinquished by" entry.

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- Enter station number (the station number is the middle portion of the station location number, between the hyphens).
- Check composite or grab sample.
- Enter station location number (the same number as the station location on the tag and label).
- Enter the total number of containers per station number and the type of each bottle.
- Enter either the inorganic traffic report number, the organic traffic report number, or the SAS number for each station number in the remarks column.
- Enter the tag number from the bottom of the sample identification tag in the remarks column for each station location.
- Make sure that the person receiving the sample signs the "Received by" entry, or enter the name of the carrier (e.g., UPS, Federal Express) under "Received by." Receiving laboratory will sign "Received for Laboratory by" on the lower line and enter the date and time.
- Enter the bill-of-lading or Federal Express airbill number under "Remarks," in the bottom right corner, if appropriate.
- Place the original (top, signed copy) of the Chain-of-Custody Record Form in the appropriate sample shipping package. Retain the pink copy with field records.
- Sign and date the custody seal, a 1- by 3-inch white paper label with black lettering and an adhesive backing. Attachment G is an example of a custody seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field. Custody seals are provided by ZPMO on an as-needed basis.
- Place the seal across the shipping container opening so that it would be broken if the container is opened.
- Complete other carrier-required shipping papers.

The custody record is completed using black waterproof ink. Any corrections are made by drawing a line through and initialing and dating the change, then entering the correct information. Erasures are not permitted.

Common carriers will usually not accept responsibility for handling Chain-of-Custody Record Forms; this necessitates packing the record in the sample container (enclosed with other documentation in a plastic zip-lock bag). As long as custody forms are sealed inside the sample container and the custody seals are intact, commercial carriers are not required to sign off on the custody form.

If sent by mail, the package will be registered with return receipt requested. If sent by common carrier or air freight, proper documentation must be maintained.

The laboratory representative who accepts the incoming sample shipment signs and dates the Chain-of-Custody Record, completing the sample transfer process. It is then the laboratory's responsibility to maintain internal logbooks and custody records throughout sample preparation and analysis.

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### 5.3.3 Receipt for Samples Form

Whenever samples are split with a private party or government agency, a separate Receipt for Samples Record Form is prepared for those samples and marked to indicate with whom the samples are being split. The person relinquishing the samples to the party or agency shall require the signature of a representative of the appropriate party acknowledging receipt of the samples. If a representative is unavailable or refuses to sign, this is noted in the "Received by" space. When appropriate, as in the case where the representative is unavailable, the custody record shall contain a statement that the samples were delivered to the designated location at the designated time. This form must be completed and a copy given to the owner, operator, or agent-in-charge even if the offer for split samples is declined. The original is retained by the Field Operations Leader.

### 6.0 REFERENCES

U.S. EPA, 1984. User's Guide to the Contract Laboratory Program, Office of Emergency and Remedial Response, Washington, D.C.

### 7.0 ATTACHMENTS

- Attachment A - Chain-of-Custody Record Form for use in Region I
- Attachment B - Chain-of-Custody Record Form for use in Region II
- Attachment C - Chain-of-Custody Record Form for use in Region III
- Attachment D - Chain-of-Custody Record Form for use in Region IV
- Attachment E - Sample Label
- Attachment F - Sample Identification Tag
- Attachment G - Chain-of-Custody Seal



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**ATTACHMENT B**  
**CHAIN-OF-CUSTODY RECORD FORM FOR USE IN REGION II**  
 (Original is 8 by 10-1/2)  
**CHAIN OF CUSTODY RECORD**

ENVIRONMENTAL PROTECTION AGENCY - REGION II  
 SURVEILLANCE & ANALYSIS DIVISION  
 PRINCETON, NEW JERSEY 08507

Name of the P and Address						
Sample Number	Number of Containers	Description of Samples				
Person Assuming Responsibility for Sample					Time	Date
Sample Number	Relinquished By	Received By	Time	Date	Reason for Change of Custody	
Sample Number	Relinquished By	Received By	Time	Date	Reason for Change of Custody	
Sample Number	Relinquished By	Received By	Time	Date	Reason for Change of Custody	
Sample Number	Relinquished By	Received By	Time	Date	Reason for Change of Custody	

D334901

ENVIRONMENTAL PROTECTION AGENCY  
Office of Enforcement

REGION 3  
Curtis Bldg., 6th & Walnut Sts.  
Philadelphia, Pennsylvania 19106

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	REMARKS				
SAMPLERS: (Signature)											
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION						
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks			

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

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ATTACHMENT C  
CHAIN-OF-CUSTODY RECORD FORM FOR USE IN REGION III  
(Original is 8-1/2 x 11-3/4")



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ATTACHMENT E  
SAMPLE LABEL

<input type="checkbox"/> <input type="checkbox"/> <b>NUR</b> PROJECT: _____ <small>CONSTRUCTION</small>	
STATION LOCATION: _____	
DATE: ____/____/____ TIME: _____ hrs.	
MEDIA: WATER <input type="checkbox"/> SOIL <input type="checkbox"/> SEDIMENT <input type="checkbox"/> _____ <input type="checkbox"/>	
CONCENTRATION: LOW <input type="checkbox"/> MED <input type="checkbox"/> HIGH <input type="checkbox"/>	
TYPE: GRAB <input type="checkbox"/> COMPOSITE <input type="checkbox"/>	
ANALYSIS	
VOA <input type="checkbox"/>	BNA's <input type="checkbox"/>
PCB's <input type="checkbox"/>	PESTICIDES <input type="checkbox"/>
METALS: TOTAL <input type="checkbox"/>	DISSOLVED <input type="checkbox"/>
CYANIDE <input type="checkbox"/>	_____ <input type="checkbox"/>
PRESERVATION	
Cool to 4°C	<input type="checkbox"/>
HNO <sub>3</sub> to pH <2	<input type="checkbox"/>
NAOH to pH >12	<input type="checkbox"/>
_____	<input type="checkbox"/>
Sampled by: _____	
Case No.: _____ Traffic Report No.: _____	
Remarks:	

ACTFILE: FORMS\BOTLABL

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ATTACHMENT F  
SAMPLE IDENTIFICATION TAG

☆ GPO 506-552

Designate:	Grab	Preservative: Yes <input type="checkbox"/> No <input type="checkbox"/>
	Comp.	
Time	Samplers (Signatures)	ANALYSES
		BOD Anions
Solids (TSS) (TDS) (SS)		
COD, TOC, Nutrients		
Phenolics		
Mercury		
Metals		
Cyanide		
Oil and Grease		
Organics GC/MS		
Priority Pollutants		
Station No.		Station Location
Month/Day/Year		Pesticides
		Mutagenicity
		Bacteriology
Project Code		Remarks:
	Tag No.	Lab Sample No.
	3 60966	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



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ATTACHMENT G  
CHAIN-OF-CUSTODY SEAL

_____ <b>Signature</b>			<b>CUSTODY SEAL</b>
_____ <b>Date</b>			_____ <b>Date</b>
<b>CUSTODY SEAL</b>			_____ <b>Signature</b>

**APPENDIX B.3**

**PROCEDURE NO. SA-6.2, SECTION 5.0: SAMPLE PACKAGING AND SHIPPING**

Subject  <b>SAMPLE PACKAGING AND SHIPPING</b>	Number  SA-6.2	Page  3 of 12
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Reportable Quantity (RQ) - A parenthetical note of the form "(RQ-1000/454)" following an entry in the DOT Hazardous Materials table (49 CFR 172.101) indicates the reportable quantity of the substance in pounds and kilograms. If a spill of that amount or more of the substance occurs during transit or storage, a report must be filed with DOT according to 49 CFR 171.15-15 concerning hazardous materials incidents reports. If the material spilled is a hazardous waste, a report must always be filed, regardless of the amount, and must include a copy of the manifest. If the RQ notation appears, it must be shown either immediately before or after the proper shipping name on the shipping paper (or manifest). Most shipping papers and manifests will have a column designated "HM" which may be used for this purpose.

#### 4.0 RESPONSIBILITIES

Field Operations Leader or Team Sampling Leader - responsible for determining that samples are properly packaged and shipped.

Sampling Personnel - responsible for implementing the packaging and shipping requirements.

#### 5.0 PROCEDURES

##### 5.1 INTRODUCTION

Samples collected for shipment from a site shall be classified as either environmental or hazardous material (or waste) samples. In general, environmental samples are collected off-site (for example from streams, ponds, or wells) and are not expected to be grossly contaminated with high levels of hazardous materials. On-site samples (for example, soil, water, and materials from drums or bulk storage tanks, obviously contaminated ponds, lagoons, pools, and leachates from hazardous waste sites) are considered hazardous. A distinction must be made between the two types of samples in order to:

- Determine appropriate procedures for transportation of samples. If there is any doubt, a sample shall be considered hazardous and shipped accordingly.
- Protect the health and safety of laboratory personnel receiving the samples. Special precautions are used at laboratories when samples other than environmental samples are received.

##### 5.2 ENVIRONMENTAL SAMPLES

###### 5.2.1 Packaging

Environmental samples may be packaged following the procedures outlined in Section 5.4 for samples classified as "flammable liquids" or "flammable solids." Requirements for marking, labeling, and shipping papers do not apply.

Environmental samples may also be packed without being placed inside metal cans as required for flammable liquids or solids.

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- Place sample container, properly identified and with a sealed lid, in a polyethylene bag, and seal the bag.
- Place sample in a fiberboard container or metal picnic cooler which has been lined with a large polyethylene bag.
- Pack with enough noncombustible, absorbent, cushioning materials to minimize the possibility of the container breaking.
- Seal large bag.
- Seal or close outside container.

#### 5.2.2 Marking Labeling

Sample containers must have a completed sample identification tag and the outside container must be marked "Environmental Sample." The appropriate side of the container must be marked "This End Up" and arrows placed appropriately. No DOT marking or labeling are required.

#### 5.2.3 Shipping Papers

No DOT shipping papers are required. However, the appropriate chain-of-custody forms must be included with the shipment.

#### 5.2.4 Transportation

There are no DOT restrictions on mode of transportation.

### 5.3 DETERMINATION OF SHIPPING CLASSIFICATION FOR HAZARDOUS MATERIAL SAMPLES

Samples not determined to be environmental samples, or samples known or expected to contain hazardous materials, must be considered hazardous material samples and transported according to the requirements listed below.

#### 5.3.1 Known Substances

If the substance in the sample is known or can be identified, package, mark, label and ship according to the specific instructions for that material (if it is listed) in the DOT Hazardous Materials Table, 49 CFR 172.101.

Unz and Company have published the following steps to help in locating a proper shipping name from the Hazardous Materials Table, 49 CFR 172.101.

1. Look first for the chemical or technical name of the material, for example, ethyl alcohol. Note that many chemicals have more than one technical name, for example, perchloroethylene (not listed in 172.101) is also called tetrachloroethylene (listed 172.101). It may be useful to consult a chemist for all possible technical names a material can have. If your material is not listed by its technical name then. . . . .

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2. Look for the chemical family name. For example, pentyl alcohol is not listed but the chemical family name is: alcohol, n.o.s. (not otherwise specified). If the chemical family name is not listed then. . . . .
3. Look for a generic name based on end use. For example, Paint, n.o.s or Fireworks, n.o.s. If a generic name based on end use is not listed then. . . . .
4. Look for a generic family name based on end use, for example, drugs, n.o.s. or cosmetics, n.o.s. Finally, if your material is not listed by a generic family name but you suspect or know the material is hazardous because it meets the definition of one or more hazardous classes, then. . . . .
5. You will have to go the the general hazard class for a proper shipping name. For example, Flammable Liquid, n.o.s, or Oxidizer, n.o.s.

### 5.3.2 Unknown Substances

For samples of hazardous substances of unknown content, select the appropriate transportation category according to the DOT Hazardous Materials Classification (Attachment A), a priority system of transportation categories.

The correct shipping classification for an unknown sample is selected through a process of elimination, utilizing Attachment A. Unless known or demonstrated otherwise (through the use of radiation survey instruments), the sample is considered radioactive and appropriate shipping regulations for "radioactive material" followed.

If a radioactive material is eliminated, the sample is considered to contain "Poison A" materials (Attachment B), the next classification on the list. DOT defines "Poison A" as extremely dangerous poisonous gases or liquids of such a nature that a very small amount of gas, or vapor of the liquids, mixed with air is dangerous to life. Most Poison A materials are gases or compressed gases and would not be found in drum-type containers. Liquid Poison A would be found only in closed containers; however, all samples taken from closed drums do not have to be shipped as Poison A, which provides for a "worst case" situation. Based upon information available, a judgment must be made whether a sample from a closed container is a Poison A.

If Poison A is eliminated as a shipment category, the next two classifications are "flammable" or "nonflammable" gases. Since few gas samples are collected, "flammable liquid" would be the next applicable category. With the elimination of radioactive material, Poison A, flammable gas, and nonflammable gas, the sample can be classified as flammable liquid (or solid) and shipped accordingly. These procedures would also suffice for shipping any other samples classified below flammable liquids in the DOT classification table (Attachment A). For samples containing unknown materials, categories listed below flammable liquids/solids on Attachment A are generally not used because showing that these materials are not flammable liquids (or solids) requires flashpoint testing, which may be impractical and possibly dangerous at a site. Thus, unless the sample is known to consist of materials listed as less hazardous than flammable liquid (or solid) on Attachment A, it is considered a flammable liquid (or solid) and shipped as such.

For any hazardous material shipment, utilize the shipping checklist (Attachment C) as a guideline to ensure that all sample-handling requirements are satisfied.

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#### 5.4 PACKAGING AND SHIPPING OF SAMPLES CLASSIFIED AS FLAMMABLE LIQUID (OR SOLID)

##### 5.4.1 Packaging

Applying the word "flammable" to a sample does not imply that it is in fact flammable. The word prescribes the class of packaging according to DOT regulations.

1. Collect sample in the prescribed container with a nonmetallic, Teflon-lined screw cap. To prevent leakage, fill container no more than 90 percent full.
2. Complete sample label and sample identification tag and attach securely to sample container.
3. Seal container and place in 2-mil thick (or thicker) polyethylene bag, one sample per bag. Position sample identification tag so that it can be read through bag. Seal bag.
4. Place sealed bag inside metal can and cushion it with enough noncombustible, absorbent material (for example, vermiculite or diatomaceous earth) between the bottom and sides of the can and bag to prevent breakage and absorb leakage. Pack one bag per can. Use clips, tape, or other positive means to hold can lid securely, tightly and permanently. Mark can as indicated in Paragraph 1 of Section 5.4.2, below.
5. Place one or more metal cans (or single 1-gallon bottle) into a strong outside container, such as a metal picnic cooler or a DOT-approved fiberboard box. Surround cans with noncombustible, absorbent cushioning materials for stability during transport. Mark container as indicated in Paragraph 2 of Section 5.4.2.

##### 5.4.2 Marking/Labeling

1. Use abbreviations only where specified. Place the following information, either hand-printed or in label form, on the metal can (or 1-gallon bottle):
  - Laboratory name and address.
  - "Flammable Liquid, n.o.s. UN1993" or "Flammable Solid, n.o.s. UN1325."

Not otherwise specified (n.o.s) is not used if the flammable liquid (or solid) is identified. Then the name of the specific material is listed before the category (for example, Acetone, Flammable Liquid), followed by its appropriate UN number found in the DOT Hazardous Materials table (49 CFR 172.101).

2. Place all information on outside shipping container as on can (or bottle), specifically:
  - Proper shipping name.
  - UN or NA number.
  - Proper label(s).
  - Addressee and sender.

Place the following labels on the outside shipping container: "Cargo Aircraft Only" and "Flammable Liquid" (or "Flammable Solid"). "Dangerous When Wet" label shall be used if the solid has not been exposed to a wet environment. "Laboratory Samples" and "THIS SIDE UP" or "THIS END UP" shall also be marked on the top of the outside container, and upward-pointing arrows shall be placed on all four sides of the container.

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### 5.4.3 Shipping Papers

1. Use abbreviations only where specified. Complete the carrier-provided bill of lading and sign certification statement (if carrier does not provide, use standard industry form, see Attachment D). Provide the following information in the order listed (one form may be used for more than one exterior container).
  - "Flammable Liquid, n.o.s. UN1993" or "Flammable Solid, n.o.s. UN1325."
  - "Limited Quantity" (or "Ltd. Qty. ").
  - "Cargo Aircraft Only."
  - Net weight (wt) or net volume (vol), just before or just after "Flammable Liquid, n.o.s." or "Flammable Solid, n.o.s.," by item, if more than one metal can is inside an exterior container.
  - "Laboratory Samples" (if applicable).
2. Include Chain-of-Custody Record, properly executed in outside container.
3. "Limited Quantity" of "Flammable Liquid, n.o.s." is limited to one pint per inner container. For "Flammable Solid, n.o.s.," net weight of inner container plus sample shall not exceed one pound; total package weight shall not exceed 25 pounds.

### 5.4.4 Transportation

1. Transport unknown hazardous substance samples classified as flammable liquids by rented or common carrier truck, railroad, or express overnight package services. Do not transport by any passenger-carrying air transport system, even if they have cargo-only aircraft. DOT regulations permit regular airline cargo-only aircraft, but difficulties with most suggest avoiding them. Instead, ship by airline carriers that only carry cargo.
2. For transport by government-owned vehicle, including aircraft, DOT regulations do not apply. However, procedures described above, with the exception of execution of the bill of lading with certification, shall still be used.

## 6.0 REFERENCES

U.S. Department of Transportation, 1983. Hazardous Materials Regulations, 49 CFR 171-177.

NUS Standard Operating Procedure SA-6.1 - Sample Identification and Chain-of-Custody

NUS Standard Operating Procedure SA-1.2 - Sample Preservation

NUS Standard Operating Procedure SF-1.5 - Compatibility Testing

**APPENDIX B.4**

**PROCEDURE NO. SA-6.3, SECTION 5.0: SITE LOGBOOK**

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## 1.0 PURPOSE

This procedure describes the process for keeping a site logbook.

## 2.0 SCOPE

The site logbook is a controlled document which records all major on-site activities during a Remedial Investigation/Feasibility Study. At a minimum, the following activities/events shall be recorded in the site logbook:

- Arrival/departure of site visitors
- Arrival/departure of equipment
- Sample pickup (chain-of-custody form numbers, carrier, time)
- Sampling activities/sample logsheet numbers
- Start or completion of borehole/trench/monitoring well installation or sampling activities
- Health and Safety issues

The site logbook is initiated at the start of the first on-site activity (e.g., initial reconnaissance survey). Entries are made for every day that on-site activities take place which involve RI/FS contractor personnel. One current site logbook is maintained per site.

The site logbook becomes part of the permanent site file maintained in the RI contractor's office. Because information contained in the site logbook may be admitted as evidence in cost recovery or other legal proceedings, it is critical that this document be properly maintained.

## 3.0 GLOSSARY

Site Logbook - The logbook is a bound notebook with consecutively numbered pages that cannot be removed. Upon entry of data, the logbook requires signature by the responsible site leader (see Section 5.1).

## 4.0 RESPONSIBILITIES

The site logbook is issued by the Regional Manager (or his designee) to the Site Manager for the duration of the project. The Site Manager releases the site logbook to the Field Operations Leader or other person responsible for the direction of on-site activities (e.g., Reconnaissance Survey Team Leader, Sampling Team Leader). It is the responsibility of this person (or his designee) to keep the site logbook current while in his possession, and return it to the Site Manager or turn it over to another field team. Following the completion of all fieldwork, the site logbook is returned to the Site Manager for inclusion in the permanent site files.

## 5.0 PROCEDURES

### 5.1 GENERAL

The cover of each site logbook contains the following information:

- Project Name
- NUS Project Number
- RI/FS Contractor and Site Manager's Name
- Sequential Book Number

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- Start Date
- End Date

Daily entries into the logbook may contain a variety of information. At the beginning of each day the following information must be recorded:

- Date
- Start time
- Weather
- All field personnel present
- Any visitors present

During the day, a summary of all site activities and level of personal protection shall be recorded in the logbook. The information need not duplicate that recorded in other field notebooks (e.g., sample logbook, Site Geologist's notebook, Health and Safety Officer's notebook, etc.), but shall summarize the contents of these other notebooks and refer to the page locations in these notebooks for detailed information. An example of a site logbook page is shown in Attachment A.

The sample logsheet for each sample collected (see Procedure SA-6.6) must be referenced. If measurements are made at any location, the measurements and equipment used must either be recorded in the site logbook or reference must be made to the notebook and page number(s) on which they are recorded (see Attachment A).

All entries shall be made in black pen. No erasures are permitted. If an incorrect entry is made, the data shall be crossed out with a single strike mark, and initialed and dated. At the completion of entries by any individual, the logbook must be signed. It must also be signed by the Field Operations Leader or responsible site leader at the end of each day.

## 5.2 PHOTOGRAPHS

When movies, slides, or photographs are taken of a site or any monitoring location, they are numbered to correspond to logbook entries. The name of the photographer, date, time, site location, site description, and weather conditions are entered in the logbook as the photographs are taken. A series entry may be used for rapid-sequence photographs. The photographer is not required to record the aperture settings and shutter speeds for photographs taken within the normal automatic exposure range. However, special lenses, films, filters, and other image-enhancement techniques must be noted in the logbook. If possible, such techniques shall be avoided, since they can adversely affect the admissibility of photographs as evidence. Chain-of-custody procedures depend upon the subject matter, type of film, and the processing it requires. Film used for aerial photography, confidential information, or criminal investigation require chain-of-custody procedures. Adequate logbook notation and receipts may be used to account for routine film processing. Once processed, the slides or photographic prints shall be serially numbered and labeled according to the logbook descriptions.

## ~~6.0 REFERENCES~~

~~None.~~

## ~~7.0 ATTACHMENTS~~

~~Attachment A - Typical Site Logbook Entry~~