RI99254

SAMPLING AND ANALYSIS PLAN

NON-TIME CRITICAL REMOVAL SUPPORT
ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

RAYMARK-SHORE ROAD
STRATFORD, CONNECTICUT

RESPONSE ACTION CONTRACT (RAC), REGION I

For
U.S. Environmental Protection Agency

By
Tetra Tech NUS, Inc.

EPA Contract No. 68-W6-0045
EPA Work Assignment No. 035-NSEE-01H3
TtNUS Project No. N0162

February 1999

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RAC 1
SAMPLING AND ANALYSIS PLAN
RAYMARK SHORE ROAD
STRATFORD, CONNECTICUT

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1.0 PROJECT INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS), at the request of the U.S. Environmental Protection Agency (EPA), Region I, will provide Non-Time Critical Removal (NTCR) support for the Raymark Industries Inc. Site. The field investigation will be performed in the vicinity of Shore Road and the Housatonic Boat Club. The NTCR support will be performed under contract number 68-W6-0045, and Work Assignment Number 035-NSEE-01H3.

Under this work assignment, TtNUS will be responsible for performing the following activities: mobilizing and demobilizing; performing soil borings; collecting soil samples; analyzing soil samples; and surveying all sample locations using Global Positioning System (GPS) equipment.

This Sampling and Analysis Plan (SAP) for Shore Road is divided into three sections: Section 1.0, Project Introduction; Section 2.0, the Site Management Plan and the Field Sampling Plan; and Section 3.0, the Quality Assurance Project Plan. Technical specifications (surface and subsurface soil sampling and IDW disposal) are attached as Appendices. All field work performed under this work assignment will follow the TtNUS Health and Safety Plan (HASP) used under Raymark OU2/OU4 field investigation dated October 1998.

Section 1.0 describes the project location and history.

Section 2.0 presents the Site Management Plan and Field Sampling Plan (plan) as one document, which is an integrated approach for conducting fieldwork activities. The plan addresses the project organization and responsibilities of personnel engaged in performing field investigation activities, the projected field operations schedule, and site access and security. The plan also provides detailed guidance on how activities will be performed to meet the objectives of the work assignment. This guidance includes sampling and analytical objectives; the number, type, and location of all samples to be collected during the field investigation; detailed procedures for field activities; and data management elements. TtNUS field personnel will use the plan as a guide for performing all field activities and analytical procedures according to designated, accepted protocols.

Section 3.0 presents the Quality Assurance Project Plan (QAPP). The QAPP describes the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) procedures and methodologies to be employed by TtNUS to ensure the technical integrity of analytical data, evaluation procedures, sampling and analytical procedures, and site records.

The plan also includes appendices for the field forms, technical specifications for geoprobe drilling, and data quality objective forms. Analytical specifications are submitted to EPA under the Delivery of Analytical Services work assignment. The HASP used for the Raymark OU2 and OU4 field investigations will be followed for this field investigation because site conditions and nature of the sampling activities are similar. The HASP details the site-specific health and safety information including a hazard assessment, personnel training, monitoring procedures for site operations, safe operating procedures, health and safety equipment, disposal procedures, and other health and safety requirements.

1.1 Site Background Information

This section describes the site history and working project definitions.

1.1.1 Site History

The Raymark Industries, Inc. (Raymark Facility) site, formerly named Raybestos - Manhattan Company, was located at 75 East Main Street in Stratford, Fairfield County, Connecticut. This former Resource Conservation and Recovery Act (RCRA) facility occupied 33 acres. The company manufactured friction materials containing asbestos and non-asbestos materials, metals, phenol-formaldehyde resins, and various adhesives.

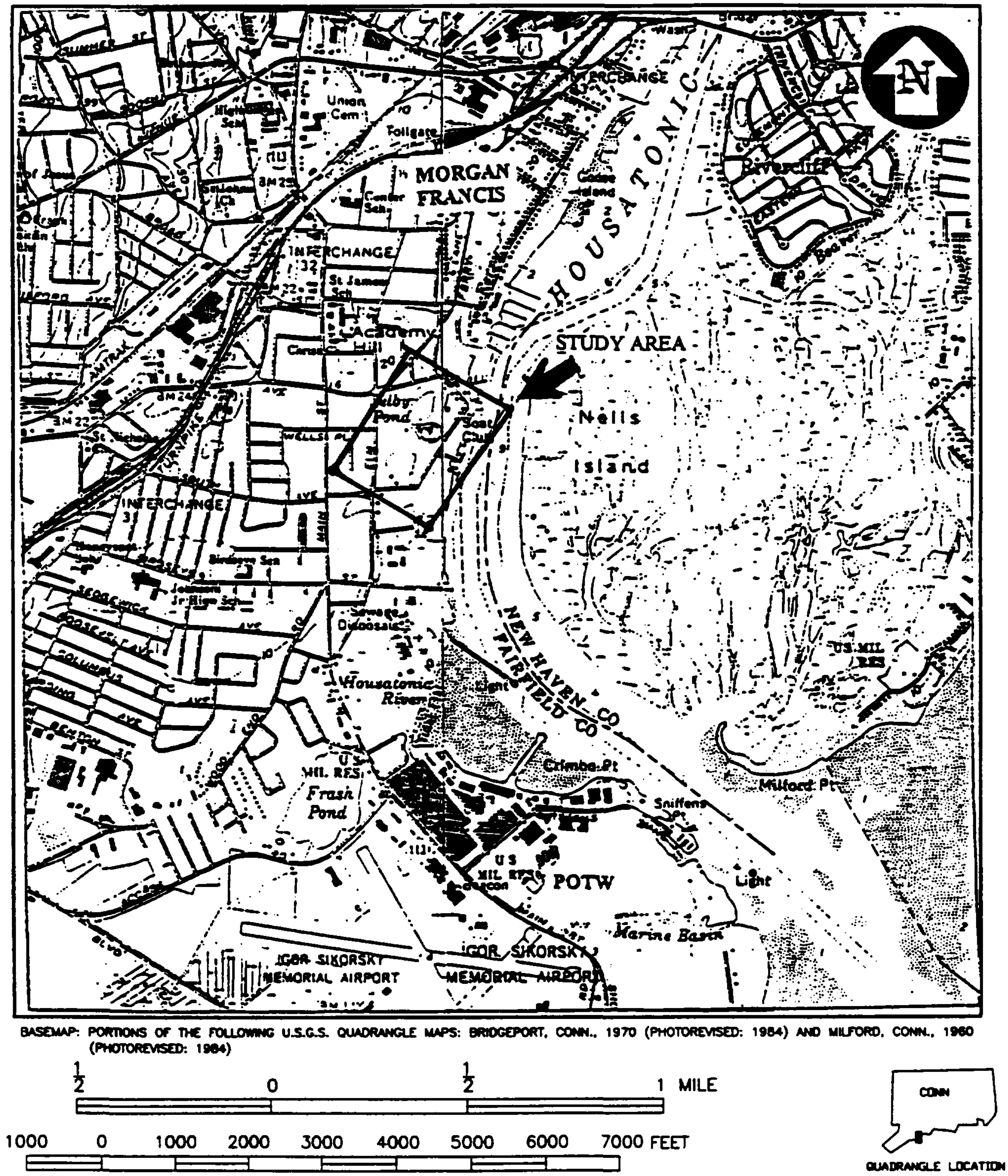
Primary products were gasket material, sheet packing and friction materials including clutch facings, transmission plates, and brake linings. As a result of these activities, soils at the site are known to be contaminated with asbestos, lead, polychlorinated biphenyls (PCBs) and other pollutants. Raymark Industries, Inc. was added to the National Priorities List (NPL) on January 18, 1994.

Raymark operated from 1919 until 1989, when the plant was shut down and permanently closed. During Raymark's 70 years of operation, it was common practice to dispose of manufacturing waste at locations in Stratford. Time-critical removal actions were completed at a number of these locations that contained the highest levels of asbestos, lead, and PCBs-contaminated soil. Contaminants present in these areas have been designated a health threat and were excavated, covered, and/or fenced. In 1996, the Raymark Facility was demolished, and a cap was installed in 1997.

This Work Assignment addresses the soils around Shore Road, The Shakespeare Festival Theatre, and the Housatonic Boat Club (see Figure 1-1 for study area). Sampling will be conducted on both public and private property around the Shore Road area.

1.1.2 Working Project Definitions

In this SAP the site includes Shore Road and the surrounding residential, municipal, and commercial properties. See Figure 1-1.



BASEMAP: PORTIONS OF THE FOLLOWING U.S.G.S. QUADRANGLE MAPS: BRIDGEPORT, CONN., 1970 (PHOTOREVISED: 1984) AND MILFORD, CONN., 1960 (PHOTOREVISED: 1984)

SITE LOCATION			FIGURE 1–1
SAMPLING ANALYSIS PLAN			TETRA TECH NUS, INC. 55 Jonspin Road Wilmington, MA 01887 (978)658-7899
RAYMARK – SHORE ROAD – STRATFORD, CT			
DRAWN BY: D.W. MACDOUGALL	REV.: 0		
CHECKED BY: W. IRWIN	DATE: FEBRUARY 25, 1999		
SCALE: AS SHOWN	ACAD NAME: :\RAYMARK\OU3\AREAMR\SITE_LOC.DWG		

1.2 Overview of Field Activities

The Shore Road soil Investigation field activities scoped under this SAP include the following:

- Mobilization
- Soil borings
- Surface and subsurface soil sampling
- Field analysis for lead and polychlorinated biphenyl compounds (PCBs)
- Off-site analysis of soil samples for asbestos and dioxins
- Global Positioning System Survey
- Investigation-derived waste (IDW) characterization and disposal.
- Demobilization

2.0 SITE MANAGEMENT/FIELD SAMPLING PLAN

This section presents the project organization, personnel responsibilities, schedule, and site control. This section also presents the field sampling activities such as sampling and analytical objectives, locations, and methods, as well as QA/QC requirements and field activity procedures.

2.1 Project Organization and Schedule

This section describes the project organization and schedule, including responsibilities of the personnel involved in performing the work assignment. Key project personnel and their responsibilities are outlined below.

TtNUS field personnel conducting the work outlined in this SAP will consist of a Field Operations Leader (FOL), and field personnel. The FOL will report directly to the TtNUS Project Manager. Responsibilities of the FOL include supervising field operations and coordinating daily with the various subcontractors; ensuring the procedures specified in the work plan and SAP are properly implemented (and if any field changes need to be made, processing and approving a Field Modification Record); maintaining daily sampling and shipping schedules; and reporting to the Project Manager on the status of the field activities on a regular basis. In addition, the FOL will manage the assigned field staff to efficiently carry out the field activities. The FOL will constantly evaluate field tasks, the personnel assigned to a task, the duration of a task and make adjustments as necessary.

A Site Safety Officer (SSO) will be appointed from the TtNUS field team personnel. The SSO will assist in implementing the Health and Safety Plan. The SSO will report directly to the TtNUS Health and Safety Officer on any health and safety issues. The SSO will also report any hazards, injuries, or decisions to stop work to the FOL who, in turn, will contact the TtNUS Project Manager.

Field work is scheduled to begin on March 1, 1999 and continue until March 9, 1999.

2.2 Site Control

The following subsections contain information regarding the control of activities at the site.

2.2.1 Site Access

The EPA will be responsible for coordinating with property owners and for obtaining written property access agreements to advance soil borings prior to TtNUS work on the site. Because part of the site is on public roads, traffic in and around work at these locations may be heavy. Appropriate control and safety measures will be used as described in the HASP.

2.2.2 Utility Clearance and Other Permits

The drilling subcontractor is responsible for obtaining clearance of all underground utilities at all drilling prior to mobilizing drilling equipment. The drilling subcontractor must obtain DOT and other permits prior to initiating the work. No borings will be located without property access, utility clearances, and EPA Work assignment Manager (WAM) approval.

2.2.3 Field Office/Command Post

A temporary trailer and associated utilities and facilities will be located at the Morgan Francis property for use on the Shore Road investigation. The investigation staff will oversee the placement of the decontamination pad, and establish areas for equipment storage; drum staging; and drums containing IDW.

2.2.4 Site Security/Control

As directed by the FOL, all removable equipment will be secured at the end of each workday, returned to either the command post, a locked vehicle, or the hotel. Unfinished work and work areas will be secured each day to prevent tampering or accidental injury to the public.

Appropriate security measures such as fencing, barricades, caution tape, or storage containers will be used to define decontamination pads, staging areas, and other potential hazard areas.

2.3 Field Sampling Activities

The field sampling activities are defined under Section 1.2.

2.3.1 Mobilization/Demobilization

This section describes the mobilization and demobilization of both TtNUS personnel and TtNUS subcontractor personnel.

2.3.1.1 TtNUS Mobilization/Demobilization

Prior to beginning any fieldwork, all field team members will review the Statement of Work (SOW), Work Plan, this SAP, the HASP, and all applicable Standard Operating Guidelines (SOGs) and Standard Operating Procedures (SOPs) identified in Section 3.0 of this SAP. In addition, prior to the beginning fieldwork, a field team orientation meeting will be held with the staff identified to support the identified work. At this meeting, the site safety officer will be identified, the scope of work tasks and schedules will be identified, and the FOL will familiarize personnel with the scope of the field activities.

Equipment mobilization may include, but will not be limited to, transporting and preparing the following equipment:

- Field office equipment
- Sampling and shipping equipment
- Health and safety equipment
- Decontamination equipment
- Global positioning system survey equipment

- Subcontractor equipment (drilling, and waste management)

The FOL will coordinate the TtNUS mobilization and demobilization. The FOL will also coordinate any equipment purchases necessary to conduct the field investigation. The equipment for the soil boring investigation, sampling, and health and safety decontamination will be transported to the site prior to initiation of fieldwork. The equipment necessary for health and safety needs, will be mobilized, as needed, for each field activity.

2.3.1.2 Subcontractor Mobilization/Demobilization

Subcontractors will be used for the following field investigation activities: 1) laboratory analyses, 2) drilling, and 3) IDW characterization and disposal.

The mobile laboratory subcontractor is responsible for mobilizing a field trailer equipped with gas chromatograph and XRF equipment to screen approximately 30 soil samples per day for PCBs and lead.

The drilling subcontractors will be responsible for mobilizing and demobilizing the equipment and personnel necessary to perform the work outlined in the specifications included in Appendix B. Drilling subcontractors will be responsible for obtaining dig safe services and any other permits required by federal, state, and local authorities. All site activities will be recorded in the site logbook by a TtNUS representative. Any deviations from standard procedures will be recorded on a Field Modification Report (FMR). All verbal findings shall be recorded in the logbook.

2.3.2 Soil Borings

The soil boring drilling and soil sampling activities are described in this section. TtNUS will subcontract a drilling company to advance approximately 100 soil borings in the Shore

Road and Housatonic Boat Club Area. Three soil samples from each boring will be collected and sent for laboratory analysis.

2.3.3.1 Boring Identification

Borings will be identified in accordance with the following system:

- The borings will be identified beginning with SR-SO01.

Additional information for sample identification is detailed in Section 2.3.2.3.

2.3.2.2 Soil Sample Collection

Boring locations will be staked out in 50-foot intervals throughout the Shore Road Site using a grid design (Figure 2-1). The subcontractor will begin with the soil borings on the center line of Shore Road. The sampling will continue along grid lines running parallel to Shore Road. The grid line west of Shore Road will be advanced, and the results from the lead, PCB and asbestos analyses will be reviewed to determine which borings on the next southwesterly grid line will be advanced. If the results of one of the three analyses for a sample exceed the EPA-determined criteria (400 ppm for lead, 1 ppm for total PCBs and 1 percent for asbestos), then a boring will be advanced at the next southwesterly location. If the results do not exceed any of the criteria, no additional samples will be collected along that row (in a southwesterly direction). All borings on the northeast side of Shore Road will be advanced regardless of the analytical results. Soil samples will be collected from each soil boring at three discrete intervals. A minimum 2-inch diameter macro-core sampler will be advanced to the appropriate soil sampling intervals. The first sample shall start at ground surface and continue for 6 inches. Sampling shall continue through the soil at the depth intervals of 1.5 - 2.5 feet and 3 - 4 feet below ground surface. In areas covered with asphalt, the first interval will start immediately beneath the asphalt and then proceed as indicated above.

TARGET SHEET

THE MATERIAL DESCRIBED BELOW
NOT SCANNED BECAUSE:

(X) OVERSIZED

() NON-PAPER MEDIA

() OTHER

DESCRIPTION: PROPOSED BORING LOCATION PLAN, SHORE ROAD EE/CA, RAYMARK - STRATFORD, CT.

LEGEND COPIED ONLY.

THE OMITTED MATERIAL IS AVAILABLE FOR REVIEW
AT THE EPA NEW ENGLAND SUPERFUND RECORDS CENTER,
BOSTON, MA

DRAWN BY: D.R. MAHER /R.G. DEWSNAP
PREPARED BY: W. IRWIN
PROJECT MANAGER: H. FORD
PROGRAM MANAGER: G. GARDNER

TITLE:
PROPOSED BORING LOCATION PLAN
SHORE ROAD EE / CA
RAYMARK - STRATFORD, CT

SOURCE:
BASE PLAN MODIFIED BY EPA

SCALE: 1" = 80'
DATE: FEBRUARY 25, 1999
PROJ. NO: N0162
DRAWING NO: 2-1
ACFILE NAME: \DWG\RAYMARK\OU3\SHORE_RD\SHORE_BORING.DWG
REV: 0

TETRA TECH NUS, INC
55 JONSPIN ROAD
WILMINGTON, MASSACHUSETTS 01887
(978)658-7899

The soil from each sample interval will be placed in a decontaminated stainless steel bowl, homogenized, and then transferred to the appropriate sample containers for analysis. Soil sample descriptions and depth intervals will be documented on the sample logsheet or boring log, with other pertinent sampling data. A maximum of three samples from each soil boring interval will be submitted to an on-site mobile laboratory for analysis of lead and PCBs and sent to an off-site laboratory for asbestos analysis all on a rapid (24-hour) turn-around basis. Soil will be collected from every location for possible dioxin analysis pending field laboratory results. The samples will be stored in coolers at 4°C. In an effort to ensure distribution of sampling points for dioxins, TtNUS will use the following scheme for sending soil samples for dioxin analysis:

- If two of the three EPA-determined criteria are exceeded, a sample will be sent for dioxin analysis.

- If an insufficient number of samples exceed two of the three criteria, or if the samples exceeding the criteria are grouped together on the site, the TtNUS site representative will attempt to select samples from throughout the site (both vertically and horizontally).

Table 2-1 lists the analytical methods to be used and the number of soil samples to be analyzed.

The subcontracted drilling crew will be supervised by a TtNUS geologist/engineer. Soil sampling will be performed in accordance with the Geoprobe Drilling Specification in Appendix B. A boring log will be prepared for each boring.

The drilling subcontractor will decontaminate all soil samplers prior to each use according to the TtNUS Technical Drilling Specification (Appendix B).

The TtNUS representative will be responsible for the following:

TABLE 2-1
METHOD OF ANALYSIS AND FIELD QUALITY CONTROL SAMPLE SUMMARY
SOIL SAMPLING
RAYMARK SHORE ROAD EE/CA
STRATFORD, CONNECTICUT

Soil	Analysis	Method	No. Of Samples	Field Duplicates[1] [5]	Rinsate Blanks [5]	Trip Blanks	PE	Total
Laboratory Analysis	PCBs (DAS)	EPA PCB Screening Method [3]	300	15	0	0	6	321
	Lead (DAS)	EPA Metals Screening Method[3]	300	15	0	0	6	321
	Dioxin (DAS)	1613B [4]	25	3	3	0	2	33
	Asbestos (DAS)	Polarized Light Microscopy[2]	300	15	0	0	0	315

NOTES:

(1) Duplicates for field screening for PCB, lead and asbestos will be collected at a rate of 1 per 20 samples.

(2) The Protocol for Determining Asbestos Content in River Sediments and Soil Samples by USEPA Region I, 1994. According to TtNUS Technical Specification S99-RACI-090.

(3) Soil screening for PCB according to TtNUS Technical Specification No. S99-RACI-088.

(4) Soil analysis for Dioxins, U.S. EPA Method 1613B, 40CFR Part 136, Vol. 62, No. 178. Monday, September 15, 1997. According to TtNUS technical Specification No. S99-RACI-089.

(5) Field duplicates and rinsate blanks for dioxins will be collected at a rate of 1 per 10 samples.

- Identifying the sample depth interval.
- Screening each sample for VOCs with a PID/FID.
- Classifying each strata according to the Unified Soil Classification System (TtNUS SOP No. GH-1.5) and noting the depth of change in each strata.
- Preparing boring logs.

Laboratory Analysis of Soil Samples

Soil samples from approximately 100 borings at the Shore Road site will be collected, placed in the appropriate sample containers (Table 2-2), and sent to the proper laboratory for rapid (24-hour) turn-around analysis of PCBs, lead, and asbestos. PCB and lead screening samples will be delivered to the on-site field laboratory regularly throughout the day. Soil samples for asbestos will be sent daily to an off-site laboratory for analysis. Dioxin samples will be sent to a DAS laboratory for analysis after review of PCB, lead, and asbestos results. If an insufficient amount of soil exists to fill all the sample containers, the analyses will be prioritized as follows:

- asbestos
- PCBs
- lead
- dioxin

2.3.2.3. Sample Location Identification System

Each sample taken from the Shore Road study area will be assigned a unique sample location tracking number. The sample location tracking number will consist of a four- to five-segment, alpha-numeric code that identifies the site, sample medium, specific sample identifier, sample

TABLE 2-2
SAMPLE CONTAINER, PRESERVATION, AND MAXIMUM HOLDING TIMES
RAYMARK SHORE ROAD EE/CA
STRATFORD, CONNECTICUT

Media	Analysis	Containers Per Sample(3)	Container Type(1)	Preservation	Holding Times(2)
Soil	PCBs (DAS)	1	4 oz. WM jar (3)	4°C	14 days
	Lead (DAS)	1	4 oz. WM jar (3)	4°C	28 days
	Dioxin (DAS)	1	4 oz. WM amber jar	4° C	40 days
	Asbestos (DAS)	1	Ziplock bag	None	None

NOTES:

(1) Sample containers for chemical analysis shall meet specifications delineated in EPA OSWER Directive No. 9240.0-05A.

(2) Maximum holding time from date of sample collection to date of sample extraction or analysis based on analyte with shortest holding time.

(3) PCB and lead samples may be combined into one 4 oz. container for on-site analysis.

round, and the quality control (QC) sample designation, as appropriate. Any other pertinent information regarding sample identification will be recorded in the field logbooks or on sample log sheets.

The alpha-numeric coding to be used in the sample location numbering system is explained in the following diagram and the subsequent definitions:

AA-	AA	(varies)	NNNN	AA
Site - Identifier	Medium and method	Location Identifier	Event or Depth)	QC Sample Designation

Character type:

A = Alpha
N = Numeric

Site Identifier: Includes the site name and the property name

SR = Shore Road study area

Medium:

SO = Soil sample

Location Identifier:

Soil location identifiers will be the borehole the sample is collected from.

Sample Event or Depth

The depth from which the sample was collected will be recorded using a 4 digit code.

Decimals will be used to represent tenths of a foot. A soil sample collected from 0 to 6 inches in borehole 1, would be designated as: SR-SO01-000.5

The first duplicate soil sample will be identified as:

SR-SO-DUP-01.

The duplicate and rinsate blank will be recorded in the field log book and/or the sample log sheet.

QC Sample Designation, if applicable:

DUP = Duplicate
RB = Rinsate Blank
PE = Laboratory QC sample
The QC designation are omitted for other samples.

2.3.2.4 Equipment Decontamination

This section provides guidelines for decontaminating equipment used during this soil investigation.

Decontamination During Drilling

The drilling specification requires the drilling subcontractors to have in storage sufficient downhole equipment to perform sampling at five soil boring locations without decontaminating between holes. All downhole drilling equipment will be steam-cleaned using a high-pressure steam wash in a portable decontamination device prior to use.

2.3.3 Global Positioning System Survey

TtNUS will use global positioning system (GPS) equipment to obtain the northing and easting coordinates of all soil boring locations to sub-meter accuracy.

2.3.4 Control and Disposal of Investigation Derived Waste (IDW)

Investigative-derived waste procedures will be implemented as follows:

- Contaminated safety equipment, soils, and decontamination fluids generated during the field investigation will be containerized in labeled Department of Transportation (DOT)-approved 55-gallon drums and stored at the designated storage area on the Morgan Francis property for characterization and disposal at a later date. All liquids will be pumped into the fractionization tank located on the Morgan Francis property. Solids will remain in drums, until removal by the IDW subcontractor (who may bulk solids).

- The personal protective equipment (PPE) waste generated during work will be decontaminated and stored in plastic bags and returned to the command post for disposal at the end of each work day in an industrial dumpster at a location to be determined by the TtNUS field representative.

    - The area where work is performed under this SAP and the Morgan Francis property is considered to be "the Site".

    - The transportation of IDW on the Site will be performed by the drilling subcontractor.

2.3.4.1 Site Preparation Activities During Mobilization

Prior to conducting any intrusive activities during this investigation, site preparation activities will be completed at the Morgan Francis property. These activities include procuring and installing the following items:

- Equipment storage unit.
- Locations and preparation of a staging area, and temporary storage area.
- Vehicle decontamination area.

2.3.4.2 Handling of Contaminated Soil

The soil generated during drilling activities associated with the Shore Road project will be transferred by the drilling subcontractor into 55-gallon drums, sealed, and transported to the Morgan Francis property by the drilling subcontractor, where it will be staged on pallets. The waste materials will be temporarily stored at the Morgan Francis property until transported to an approved disposal facility by a transportation and disposal subcontractor.

Drum Labeling

After IDW soil/sediment is drummed and the lid clamped tight, the drum will be marked using a waterproof indelible ink marker; an example follows:

- Drum No: SR-01-(Shore Road - drum # 01)
- Date first accumulated: 3/01/99
- Source(s) of soil: Soil sample ID#
- Volume(s) of soil: 5 gallons/sample ID#

A metal tag with a unique identification number will be attached to each drum for backup identification purposes. Unique numbers will be used to identify the source of the soil stored in each drum.

Drum labeling is necessary to identify materials stored in the drums and to evaluate how the drummed material will be sampled for waste characterization.

2.3.4.3 Drilling Equipment and Vehicle Decontamination

Pressure washing will be used to decontaminate drilling equipment and support vehicles, as necessary. Contaminated wash water will be contained in a polyethylene-lined (or equivalent) decontamination area. The contaminated water will then be conveyed to the storage tank located on the Morgan Francis property for temporary storage and characterization.

Efforts will be made to minimize the need to decontaminate the drilling rigs and support vehicles. Any soil remaining on the truck sides or tires will be removed by brushing. If necessary, pressure washing will be used to remove any remaining contaminated material.

2.3.4.4 Decontamination Liquid Handling

Decontamination liquids generated during the Shore Road investigations will be collected and transported to the Morgan Francis property staging area by the driller. The drilling subcontractor will be responsible for pumping the IDW liquids into a storage tank and for characterizing the IDW liquid. If the effluent meets the analytical requirements for discharge, then, upon approval, the IDW liquids will be disposed at the Stratford publicly owned treatment facility (POTW).

2.3.4.5 Handling and Disposal of Waste PPE

At the end of each day, PPE will be cleaned using a brush, soap, and water, and will be doubled bagged. Filled bags will be staged at the Morgan Francis property in an appropriate designated area. All PPE bags will be disposed of in the dumpster. Any contaminated PPE will be placed in drums for disposal as IDW.

2.3.4.6 Waste Soil

The soil from the drilling and soil sampling will be loaded into 55-gallon drums and hauled to the Morgan Francis property where it will be temporarily stored until off-site disposal has been arranged. The waste soil will be characterized based on soil chemical testing results, and additional analyses required by the licensed facility to evaluate options for treatment and/or disposal.

2.3.4.7 Transportation and Disposal Subcontractor

A licensed hazardous waste transportation and disposal subcontractor will be required to transport and dispose of the nonhazardous and hazardous waste streams. A subcontractor will be contracted to provide the vehicles, including drivers, to transport the IDW waste to approved off-site disposal facilities. The subcontractor will be procured to provide transportation and proper disposal locations (which will require TtNUS and EPA approval) for the contaminated soil/sediment, and decontamination water. The subcontractor will be responsible for decontaminating the storage tank prior to removal from the property.

2.3.4.8 Documentation

On a daily basis, the FOL or designee will document the generation of IDW during the investigative activities to ensure that the IDW is properly containerized and stored on the Morgan Francis property. Information will be recorded in a bound notebook. Daily records of soil/sediment stored in drums will include the following information:

- Drum No. (Unique Identification Number)
- Source of soil

- Approximate volume of soil

2.3.4.9 Hazardous Waste Manifesting Compliance

One hazardous waste manifest will be prepared by the transportation and disposal subcontractor for each shipment of IDW leaving the site.

Manifests will be completed for all hazardous wastes disposed off site, signed by TtNUS "On Behalf of EPA".

2.3.4.10 Documentation of Hazardous Materials Transportation and Disposal

Copies of all documentation of control and disposal of IDW generated by the project will be provided to the U.S. EPA. Copies will also be maintained in the project file located at the TtNUS Wilmington office.

2.3.4.11 IDW Storage

All wastes generated during this field event will be held at the Morgan Francis property pending off-site disposal. The drum storage area will be palletted and drums will be clearly marked. The liquid wastes will be pumped from the drums into the on-site fractionization tank, prior to off-site disposal.

3.0 QUALITY ASSURANCE PROJECT PLAN

The QAPP discusses project objectives and QA/QC protocols to be used to achieve the Data Quality Objectives (DQOs). The QAPP is based on the TtNUS Generic Quality Assurance Plan for the U.S. EPA Contract 68-W6-0045, dated April 29, 1994. This QAPP is organized to parallel the U.S. EPA document QA/R-5, "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations", Draft Interim Final, August 1994.

3.1 Project Management

The overall project management, including responsibilities of the personnel involved in the performance of this work assignment, are described in Section 2.1 - Project Organization and Responsibilities.

3.1.1 Project Task/Organization

The overall TtNUS project organization and responsibilities of key management personnel are discussed in Section 5.0 of the Draft Work Plan, to be issued in March 1999.

3.1.2 Problem Definition/Background

As stated in Section 1.1, Raymark-type waste is known to have been received as fill in several locations around the Town of Stratford, Connecticut. Under this work assignment, field activities and environmental sampling will be conducted at the Housatonic Boat Club, Shakespeare Theatre and along Shore Road. This field investigation will fill existing data gaps, and generate data and information required to support the NTCR and EE/CA.

3.1.3 Project/Task Description

The field activities included in this SAP are:

- Mobilization
- Soil borings
- Surface and subsurface soil sampling
- Field screening for lead and polychlorinated biphenyl compounds (PCBs)
- Off-site analysis of soil samples for asbestos and dioxins
- Global Positioning System Survey
- Investigation-derived waste (IDW) characterization and disposal.
- Demobilization

The soil sampling activities will entail the following:

<u>Soil Sampling</u>

- Collect soil samples at borings located on the Shore Road site in three discrete intervals. The first sample shall start at ground surface and continue for 6 inches. The sampling device shall be advanced through the soil and samples will be collected from depth intervals of 1.5-2.5 feet and 3-4 feet below ground surface. In areas covered with asphalt, the first interval will start immediately beneath the asphalt and then proceed as indicated above.

- Approximately 300 samples shall be collected from the 100 proposed soil boring locations. Three samples from each soil boring sample interval will be submitted to laboratories on a rapid (24-hour) turn-around basis. Two samples will be sent to an on-site laboratory for lead and PCB screening, and one sample will be sent to an off-site laboratory for asbestos analysis. Twenty-five samples will be selected for dioxin analysis, based on the quick turn-around results.

Subcontractors will be used for the following field investigation activities: 1) laboratory services, 2) drilling services, and 3) IDW characterization and disposal.

3.1.4 Data Quality Objectives (DQO) and Criteria for Measurement Data

The development of DQOs focuses on identifying the end use of the data to be collected and on determining the degree of certainty with respect to precision, accuracy, representativeness, completeness, and comparability (PARCC) necessary to satisfy the intended use of the data.

The data to be collected in this investigation will support the NTCRA and the design and implementation of the EE/CA. The DQO summary forms are included in Appendix C.

Soil Data Quality Objectives - The sampling objective is to adequately delineate the surface soil contamination both vertically (up to 4 feet below ground surface) and horizontally. The delineation is intended to provide sufficient definition of volume of contaminated soil, and support a cost estimate for purposes of excavation. Soil analysis will be performed by an on-site mobile lab and off-site DAS laboratory on a rapid (24-hour) turnaround basis. The DAS screening results will undergo a Tier II data validation and dioxin results will be validated by EPA.

3.1.5 Special Training Requirements/Certification

All TtNUS employees and subcontractors working on site in hazardous waste site investigations receive the 40-hour health and safety training course and an annual 8-hour refresher course to comply with the OSHA requirements. In addition, supervisory personnel receive the 8-hour supervisor training.

All field team members will review the associated work plan, this SAP, the HASP and all applicable SOPs. In addition, a field orientation meeting will be held with the Project Manager, the Lead Chemist, and the Health and Safety Officer prior to initiating the sampling event to familiarize field team members with the scope of the field activities.

Project team personnel are trained in the specific procedures to be followed during the execution of the work, including but not limited to project QA/QC requirements, sampling, chain of custody, document control, test and inspection methods, calibration, and in particular, the general provisions of this QAPP, and its supporting procedures and guidelines.

3.1.6 Documentation and Records

Documentation to be used in the field investigation is described below.

3.1.6.1 Site Log Book

A bound site log book (notebook) will be maintained by the FOL. The FOL or designee will record all information related to sampling or field activities. This information will include sample time, weather conditions, unusual events, field measurements, and descriptions of photographs, etc. Additional field logbooks (notebooks) will be used to cover specific tasks, i.e., geoprobe logbooks, however, the site logbook will contain a summary of each day's activities and will reference the other field notebooks and field forms when applicable. The requirements of the site logbook are outlined in SOP SA-6.3.

3.1.6.2 Soil Boring Log Sheets

Soil Boring Log Sheets will be completed for each sample location by the field team. The Boring Log Sheets will contain information about the sample location, date, and time of the sample collection, as well as a sample description. An example of a soil Boring Log Sheet is included in Appendix B.

3.1.6.3 Packing List/Chain-Of-Custody Record and Seal

A chain-of-custody form will be completed for the samples submitted to the on-site and off-site laboratories. Examples of chain-of-custody forms are included in Appendix B.

3.1.6.4 Field Modification Record

Changes in field operating procedures may be necessary as a result of changed field conditions or unanticipated events. A summary of the sequence of events associated with field changes is as follows:

1. If a substantial change is required, the FOL or designee notifies the TtNUS Project Manager of the need for the change.

2. If necessary, the Project Manager will discuss the change with pertinent individuals, e.g., the EPA Region I WAM, and will provide verbal approval or denial to the FOL or assistant FOL for the proposed change.

3. The FOL will document the change on a Field Modification Record form (see Appendix B) and forward the form to the TtNUS Project Manager at the earliest convenient time.

4. The Project Manager will sign the form and distribute copies to the TtNUS Program Manager, Quality Assurance Officer, FOL, and the project file.

5. A copy of the completed Field Modification Record form will also be attached to the field copy of any affected documents, i.e., Sampling and Analysis Plan.

3.1.6.5 Additional Field Forms

Additional field forms will be used, including field instrument calibration logs and Site Entry Logs. Examples of these forms are included in Appendix B.

3.2 Measurement/Data Acquisition

This section describes the sampling design selected to achieve the objectives of the investigation. The sampling methods, handling, analytical requirements and methods, and QA/QC requirements are discussed. Data management is described, as is information about the instrumentation type, maintenance, and calibration. Detailed information is presented in Section 2.0.

3.2.1 Sampling Design

Soil sampling for the Shore Road site characterization will help delineate horizontal and vertical (up to 4 feet bgs) surface soil contamination.

This information will be used in conjunction with currently existing analytical results for soil samples collected in the vicinity of Shore Road and the Housatonic Boat Club to support the NTCR and the design and implementation of the EE/CA.

Characterization of field-generated waste will be based on soil investigation analytical results.

3.2.2 Sampling Methods Requirements

Soil sample collection, including sampling methods and equipment decontamination procedures, are discussed in Section 2.3.

3.2.3 Sample Handling and Custody Requirements

Custody of samples will be maintained at all times and documented in the chain-of-custody forms (Section 3.1.6.3). Chain of custody begins at the time the sample is collected and is maintained by storing the samples on ice in coolers that are locked or are sealed with a custody seal. The chain-of-custody forms are forwarded to the laboratory with the samples. Each sample collected will be assigned a unique sampling tracking number. A six-digit alpha-numeric sample code unique to TtNUS will be assigned to the DAS samples and on-site laboratory samples. The sample location identification system, described in Section 2.3.7.3 is based on SOP CT-04. The preferred sample location tracking number will consist of a four- to five-segment, alpha-numeric code that identifies the site, sample medium, location, sample depth, and the quality control sample designation, as appropriate.

A container filled with water and labeled "temperature blank" will be included in each cooler. The temperature of the "temperature blank" will be measured and recorded by the laboratory upon sample receipt.

3.2.4 Analytical Methods Requirements

The specific analytical requirements and methods are found in Section 2.3, and in Table 2-1. The sample containers, preservatives, and maximum allowable holding times are described in Table 2-2.

The lead and PCB analysis will be conducted according to the requirements of the DAS Technical Specification No. S99-RACI-088. The asbestos analysis will be performed in accordance with the Technical Specification No. S99-RACI-090. The turn-around time for lead, PCB, and asbestos analysis of soil samples will be 24 hours because the data results are needed for quick field decisions. Selected soil boring samples will be analyzed for dioxins according to the DAS Technical Specification No. S99-RACI-089.

The DAS technical specifications contain the method of analysis, instrumentation, detection limits, QC criteria, corrective action measures, sampling schedules, estimated number of samples, and deliverable requirements.

3.2.5 Quality Control Requirements

The quality control procedures refer to both field and laboratory control operations. The results from analysis of field and laboratory QC samples are used to document data quality and to control the data acceptance within previously established check limits in order to meet the DQO requirements for the project.

The quality control requirements for the DAS analyses are included in the technical specifications discussed above. Quality control requirements include criteria for laboratory blank acceptance, instrument tune, initial and continuing instrument calibration, instrument calibration verification, instrument performance check recoveries, matrix spikes recoveries, laboratory duplicate precision requirements, and other method-specific criteria. The corrective action procedures for non-compliant QC results are also included in the technical specifications.

3.2.5.1 Standard Operating Procedures

This section lists the applicable TtNUS to be used under this Sampling and Analysis Plan.

CT-04 - Sample Nomenclature

CT-05 - Database Records and Quality Assurance

GH-1.1 - Site Reconnaissance

GH-1.5 - Borehole and Sample Logging

SA-1.3 - Soil Sampling

SA-6.1- Non-Radiological Sample Handling

SA-6.3 - Field Documentation

SA-7.1 - Decontamination of Field Equipment and Waste Handling

ME-15 - Photovac Micro FID Handheld Flame Ionization Detector

Copies of these SOPs will be maintained in the site trailer for reference.

3.2.5.2 Field Quality Control

In addition to periodic calibration of field equipment and appropriate documentation, quality control samples will be collected or generated during sampling activities. Quality control samples include field duplicates, blanks, and performance evaluation samples. Each type of field quality control sample is defined below. Tables 2-1 and 2-2 indicate the QC sample requirements.

Rinsate Blank: Rinsate blanks are obtained under representative field conditions by running analyte-free deionized water through sample collection equipment after decontamination and placing it in the appropriate sample containers for analysis. These samples are used to assess the effectiveness of decontamination procedures. Rinsate blanks are required at a rate of one in ten samples, per matrix, or one per sampling event if less than ten samples are collected. Rinsate blanks will be collected for the dioxin analysis only.

Field Duplicates: Field duplicates will be submitted at the rate of one for every 20 samples, for PCB, lead, and asbestos analysis and at the rate of one for every 10 samples for dioxin analysis. Field duplicates are collected as collocated samples. Collocated samples are collected by filling sample containers from two locations next to each other, rather than by mixing a sample and then dividing it into two containers. Field duplicates provide precision information regarding homogeneity and distribution of the contaminants; they measure the bias of subsampling.

Performance Evaluation (PE) Samples: PE samples will be sent to the laboratory at a rate of one for every 50 samples for PCB and lead. Two PE samples will be sent for dioxin analysis for each data package. PE samples are used to assess laboratory accuracy.

Laboratory QC Samples: Laboratory QC samples will be collected at the rate of one in 20 samples per analysis for laboratory quality control. No extra volume is needed for soil matrix spike and matrix spike duplicate analyses.

3.2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

Maintenance and calibration is the process of providing the degree of care necessary to obtain high-quality production, ensuring the optimum useful life of field-work equipment. The process includes a determination of the need for, and performance of, preventative maintenance and rehabilitation.

The TtNUS Equipment Manager is responsible for the proper care, maintenance, and use of government property in its possession or control, from the time of property receipt until TtNUS is officially relieved of the responsibility, in accordance with sound industrial practice and the terms of the contract.

Maintenance can be divided into four types:

- Routine repair and adjustment
- Preventive maintenance
- Emergency repair

- Calibration

Within the maintenance function, routine repair and preventative maintenance are designed to reduce emergency repairs. The effectiveness of these two types of maintenance-repair and prevention-is the key to maximizing production by minimizing equipment downtime and wear.

3.2.7 Instrument Calibration and Frequency

The equipment used for data collection, laboratory analysis, and health and safety monitoring is calibrated and maintained according to the manufacturer's instructions. The laboratory and analytical methods referenced in Table 2-1 includes the instrument calibration requirements for each analysis. In addition, the DAS technical specifications include detailed QA/QC requirements for instrument calibration and frequency.

Monitoring instruments that will be used during the field investigation activities are listed below. The instruments will be calibrated prior to daily use and the calibration will be checked at the end of the day (or as necessary):

- Photo ionization detector (PID)
- Flame ionization detector (FID)

During calibration, an appropriate maintenance check will be performed on each piece of equipment. If damaged or failed parts are identified during the daily 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 identified parts are repaired or replaced.

Calibration is documented on an Equipment Calibration Log sheet. An example of this form is included in Appendix B.

3.2.8 Inspection/Acceptance Requirements for Supplies and Consumables

Supplies and consumables will meet the requirements of the specific task. The inspection of consumables and supplies for use in the project is performed by the TtNUS Equipment Manager and the FOL.

The TtNUS Quality Assurance Manual and the Tetra Tech NUS Procurement Policies will be applied for procuring, inspecting, and accepting procured supplies and consumables. The Equipment Manager is responsible for inspecting all instrumentation received for RAC support activities. The Equipment Manager will follow the procedures described in the TtNUS Property Management Manual.

3.2.9 Data Management

Chemical/analytical data generated during the study will be reduced to a concise form. The analytical results will be managed using an existing computer program developed by TtNUS specifically for chemical data bases. QA/QC procedures will be implemented to minimize errors that may occur during data entry or after data manipulations. The data entered into the program are checked by the database specialist, and the printouts are checked against the original laboratory sheets by another staff member.

DAS analytical data for PCB, lead, and dioxins will be received from the laboratories on diskettes and in hard copy format. Asbestos results will be received in hard copy format only and entered into the analytical database by hand.

After the data is in Microsoft Access format, the data will be checked against the chain of custody for consistency and corrections will be made as necessary. Analytical parameter names will be checked against an existing library table. Laboratory QC sample results will be sequestered in a separate table.

Draft data validation tables will be printed, reviewed, and corrected/edited during data validation, and the database revised. Final data validation tables will be printed. The database tables will then be split and normalized as necessary so that the analytical data can be presented in graphical depictions using ArcView (or other) software.

3.3 Assessment/Oversight

The activities for assessing the project implementation and the associated QA/QC are described in this section.

3.3.1 Assessments and Response Actions

The assessment actions needed to satisfy the project requirement will include the following activities:

3.3.1.1 Field Audits

Quality assurance audits will be performed by the Quality Assurance Officer (QAO) or QA Representative during field investigations. The audits will include checks on adherence to the QAPP, the SAP, and all applicable SOPs.

The QAO will prepare audit checklists or audit guides. The depth and scope of the audit will be determined and incorporated into the checklist or guidelines. At a minimum, the audit will cover the following items:

- Adherence to sample collection QAPP, SOPs, and SAP
- Chain of custody
- Documentation of field activities consistent with the SOP
- Equipment maintenance and calibration
- Training requirements for site workers

- Documentation of variances from field activities and corrective actions

The QAO will record each finding of nonconformance on a Quality Notice report submitted to the Project Manager. The distribution list for the audit report includes the RACI Program Manager, the Project Manager, the FOL, and the Program and Project QA/QC files. Any findings that require immediate corrective action will be communicated immediately to the FOL and to the Project Manager.

3.3.1.2 Performance Evaluation Samples

Performance evaluation (PE) samples are sent to the laboratories with every group of field samples to evaluate the method accuracy for the matrix analyzed. The PE results are evaluated by EPA and used to determine the data usability of the associated sample results.

Subcontracted laboratories will be audited prior to contract assignment. PE samples will be submitted periodically to assess the subcontractor performance. If needed, corrective actions will be implemented prior to repeating the sample analysis.

3.3.1.3 Corrective Action Program

The corrective action program includes identifying a non-conformance condition, studying the root cause, implementing the corrective action, and verifying the corrective action's effectiveness.

The identification of significant conditions adverse to quality, the cause of the conditions, and the corrective actions will be documented by the QAO and reported to the appropriate levels of management. The TtNUS Project Manager will have overall responsibility for implementing the corrective actions and must identify those responsible for initiating corrective actions to remedy immediate effects of the problem.

3.3.2 Reports to Management

The Project Manager will communicate with the EPA WAM on a continuing basis about the status of the project. Monthly progress reports with the technical and financial status of the project will be submitted.

The QAO will provide timely input to the TtNUS Program Manager concerning the QA/QC status for the project, including any QA/QC deficiencies noted.

At the completion of field activities, the FOL will submit the following documents to the TtNUS Project Manager: all field records, data, field notebooks, chain-of-custody forms, sample log sheets, and field summary reports, etc. The Project Manager will ensure that these materials are entered into the RAC Program document control system in accordance with RACS I General Operating Procedures (GOP), Section 3.0.

Data validation reports are submitted to the EPA. If problems are found with the analytical data from DAS analysis, the subcontracted laboratory will be notified and corrective action will be requested.

3.4 Data Validation and Usability

This section describes the data review, data verification, and data evaluation processes necessary to determine whether or not the data conform to the specified criteria satisfying the project objectives.

3.4.1 Data Review, Validation, and Verification Requirements

Data will be evaluated based on an assessment of the data summary and quality assurance forms consistent with the Region I data validation guidelines. In addition, raw analytical data will be assessed for the dioxin analysis requiring Tier III data validation. The data will be qualified based on holding times, mass spectrometry tunes, instrument calibration, blank contamination, laboratory and field duplicate precision, and surrogate/matrix spike recoveries. Data summary tables will be prepared.

The chemical analytical data will be validated by TtNUS except for the dioxin data. Data validation for the dioxin data packages will be performed by EPA. All data results will be validated consistent with EPA Region I Tier II data validation guidelines. The Tier II data validation will be conducted according to the procedures listed in Section 3.4.2.

3.4.2 Validation and Verification Methods

Chain-of-custody records for sampling, shipping, analysis, and reporting will be checked for accuracy and completeness. Validation of the chemical/analytical data will include a quality assurance assessment to determine whether specified protocols were followed by the laboratory personnel. Results for field and laboratory blanks will be reviewed to identify laboratory artifacts and cross contamination. Field and laboratory duplicate results will be evaluated for precision; the relative percent difference values will be calculated and compared to control limits. Results from surrogate spike and matrix spike analyses will be assessed for accuracy, and the percent recovery will be compared to control values. The instrument calibration will be checked and parameters analyzed out of calibration will be qualified consistent with Region I data validation guidelines. Inorganic data validation includes a check for instrument detection limits. The data validation guidelines are as follows:

- Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, EPA, 6/88 modified by Region I, 2/89.

- Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses, EPA, 2/88 modified by Region I, 11/88.

3.4.3 Reconciliation and Data Quality Objectives

The results obtained from the project will be reconciled with the DQOs to satisfy the goals for precision, accuracy, representativeness, and data completeness. Limitations on the use of laboratory or field data will be communicated to the TtNUS Project Manager. Technical reasons for data rejection or qualification will be explained in the data validation report. Reanalysis or new sampling of the locations/samples affected might be required when critical data results do not meet the DQOs established.

APPENDIX A

FIELD FORMS

BORING LOG FOR:

PROJECT NO:

LOGGED BY: TRANSCRIBED BY:

DRILLED BY (Company/Driller):

GRD. SURFACE ELEVATION: ELEVATION FROM:

BORING NO. :

START DATE:

COMPLETION DATE:

MON. WELL NO.:

CHECKED BY :

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA *METHOD* = [FID, Jar HS]

TYPE OF DRILLING RIG:

METHOD OF ADVANCING BORING:

METHOD OF SOIL SAMPLING:

METHOD OF ROCK CORING:

GROUNDWATER LEVELS:

OTHER OBSERVATIONS:

Tetra Tech NUS, Inc.

BORING NO.:

PAGE: of

Tt NUS Form 0018

TETRA TECH NUS, INC.

SAMPLE COLLECTION SUMMARY RECORD

PROJECT NAME: __________ TETRA TECH NUS JOB NO./PMS: __________

SAMPLING EVENT: __________ CASE NO.: __________ DAS NO.: __________

DATE	TIME	SAMPLE LOCATION	FIELD QC							COMMENTS

Tt NUS Form 0012

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page ____ of ____

Subcontract No.

Project No.

Laboratory Name:

Sampler Signatures

Date Shipped

Carrier

Airbill No.

No. of Coolers

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type Analysis Preservative	Container Type Analysis Preservative	Container Type Analysis Preservative	Container Type Analysis Preservative	Container Type Analysis Preservative

Relinquished By: (Signature)

Date/Time

Received By: (Signature)

Shipment for Case Complete?

YES NO

Remarks

Relinquished By: (Signature)

Date/Time

Received for Laboratory By:

Date/Time

Tt NUS Form 0022

№ 0261

TETRA TECH NUS, INC.	**FIELD INSTRUMENT CALIBRATION LOG**

INSTRUMENT NAME: ______________________________ MODEL NO.: ____________________

SERIAL NO.: ____________________ DECAL NO.: ____________ TETRA TECH NUS JOB NO./PMS ____________

CALIBRATION DATE	INITIAL READING	PROCEDURE	FINAL READING	SIGNATURE	COMMENTS

Tt NUS Form 0007

TETRA TECH NUS, INC.

PHOTOIONIZATION DETECTOR FIELD CALIBRATION LOG

Serial No.: ______________ Model No.: ______________ Decal No.: ______________

Site Name/Location: ______________ Tetra Tech NUS Job No./PMS: ______________

CALIBRATION DATE	STANDARD GAS-ISOBUTYLENE	CALIBRATION READING Isobutylene Equiv. (ppm)	CALIBRATION CHECK Isobutylene Equiv. (ppm)	SIGNATURE	COMMENTS
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				
	Lot # ______ Conc. = ______ ppm				

Tt NUS Form 0006

TETRA TECH NUS, INC.

SITE ENTRY LOG

Site Name: ______________________________ Date: __________________

Location: ______________________________ Project Number__________

NAME	REPRESENTING	TIME IN (HOURS)	TIME OUT (HOURS)	INITIALS

Tt NUS Form 0002

APPENDIX B

TECHNICAL SPECIFICATIONS

AMENDED SCOPE OF WORK
RAYMARK SITE – SHORE ROAD
STRATFORD, CONNECTICUT

4.0 SCOPE OF WORK

This scope of work amendment is an additional work task to the existing Specification S98-RAC1-064. All of the conditions of the previous sections remain as stated except as changed below.

4.1 Objective

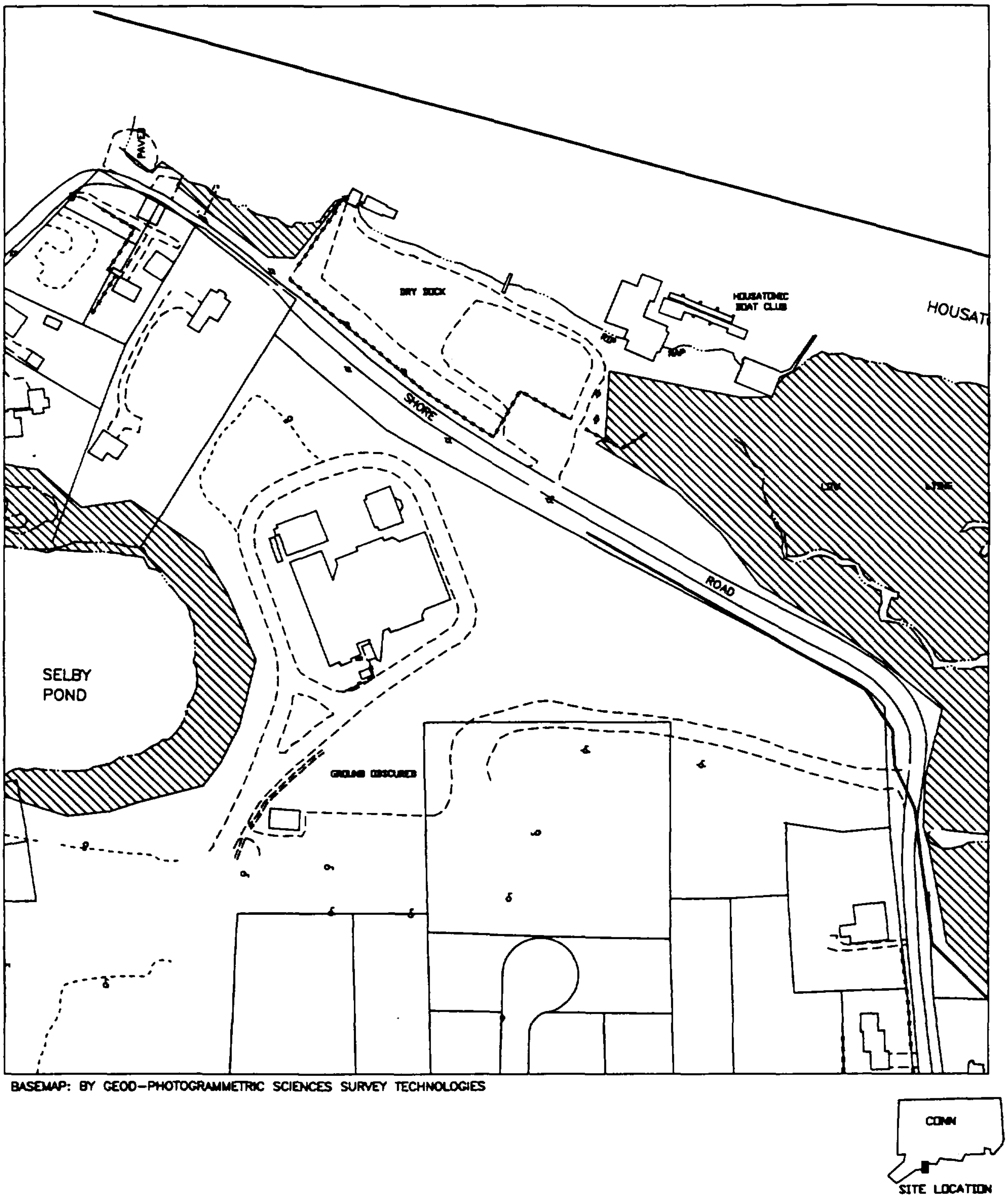
The objective of this task is to advance up to 100 soil borings using direct-push technology (DPT).

4.2 Location of Work

This work will be performed in and around the area known as Shore Road (Figure 1-1). A map with the approximate boring locations will be provided prior to work initiation. The site includes both vegetated areas and paved areas such as parking lots and roadways. Current land use is commercial. The abandoned Shakespeare Theatre is located on the western side of the property and the Housatonic Boat Club is located at the eastern portion of the site. A roadway (Shore Road) crosses through the site. Drilling will be performed on the roadway, open fields, and at the Housatonic Boat Club. The topography of the site area is relatively flat, with localized steep slopes adjacent to the Shakespeare Theatre.

4.3 General Operations

Work shall be conducted at the property specified in Section 4.2. A temporary decontamination pad shall be constructed on the Boat Club property at a location specified by the TtNUS Site Representative. The subcontractor is also required to containerize investigation-derived waste (IDW) at each boring location. This waste will be transported back to the Morgan-Francis staging area.



BASEMAP: BY GEOD-PHOTOGRAMMETRIC SCIENCES SURVEY TECHNOLOGIES

STUDY AREA LOCATION

SHORE ROAD EE/CA

RAYMARK – STRATFORD, CT

DRAWN BY:	D.R. MAHER	REV.:	0
CHECKED BY:	B. IRWIN	DATE:	FEBRUARY 10, 1999
SCALE:	1 INCH = 200 FEET	ACAD NAME: :\RAYMARK\OU3\SHORE_RD\SHORE_LOC.DWG	

FIGURE 1–1

TETRA TECH NUS, INC.

55 Jonspin Road Wilmington, MA 01887
(978)658-7899

AMENDED SCOPE OF WORK
RAYMARK SITE – SHORE ROAD
STRATFORD, CONNECTICUT

Figure 1-1

A total of up to 100 soil borings shall be advanced on site to a depth of four feet. Each soil boring will obtain a discrete interval sample using a two-inch macro-core sampler in three separate intervals: 6 inches below asphalt, 1.5-2.5 feet and 3-4 feet.

Drilling operations are anticipated to be performed under Level D personal respiratory protection, with potential upgrade to Level C, to be determined using photo ionization detectors and flame ionization detectors in the field by the TtNUS Site Representative. The subcontractor is responsible for providing all appropriate protective equipment for their personnel.

4.4 DPT Soil Borings

Soil borings shall be constructed by advancing steel rods using the direct-push geoprobe method. Up to three attempts shall be made to advance the soil boring at each location, each attempt will be restarted within a foot of the prior attempt. Subsurface soil samples shall be collected in each boring as specified in section 4.5.

The subcontractor shall submit the proposed soil boring methods and a description of the necessary equipment with the proposal. The geoprobe shall be of sufficient diameter to accommodate a minimum 2-inch macro-core sampler.

4.5 Macro-Core Sampling

Two-inch macro-core sampling shall be conducted starting at a below the asphalt. The first sample shall start below the asphalt and continue for 6-inches. Sampling shall continue through the soil at the depth intervals of 1.5-2.5 feet and 3-4 feet below ground surface. A total of 3 samples will be collected at each soil boring location.

Samples shall be acquired with nominal 2-inch outside diameter macro-core samplers. After each sample is collected, macro-core samplers shall be decontaminated prior to reuse, as specified in Section 4.13.

The TtNUS Site Representative will containerize soils from each macro-core sample. The subcontractor shall supply 4 - 8 oz. sample jars per each discrete sample interval, 12 per boring for this purpose. The jar shall be marked by the subcontractor with pertinent data, including TtNUS project identifier, boring number, sample number, sample depth, and date, and submitted to the TtNUS Site Representative.

4.6 Drilling Fluids

No drilling fluid is permitted for use while advancing geoprobe borings.

4.7 Asphalt Cutting

Prior to beginning a soil boring, the subcontractor shall use dedicated tools to remove any asphalt pavement. The amount of material removed shall be minimized; however, a sufficient amount of asphalt shall be removed to prevent collapse into the borehole during drilling or cause cross contamination of the borehole. Tools employed for cutting shall use air or potable water as a cutting fluid. No synthetic or oil-containing cutting fluids shall be permitted.

4.8 Soil Borings Abandonment

The subcontractor shall abandon a boring by first removing all tools and DPT equipment, except tools or DPT equipment lost down the hole. The boring shall be filled with locally derived materials. Any asphalt removed shall be replaced with cold patch. The subcontractor shall provide clean fill materials, as required, leaving the investigation area as it was originally found. A storage location for backfill materials on or near the site will be designated by the TtNUS Site Representative, if needed.

4.9 Other Requirements

This section presents other requirements necessary to complete the work described in this document. These requirements include: Decontamination, Equipment and Road Safety.

4.10 Decontamination

This section presents a general discussion, Decontamination Pad Construction and Equipment Decontamination.

4.11 General

All downhole drilling, sampling, and testing equipment shall be free of paint or any petroleum-based greases/lubricants prior to drilling. The geoprobe shall be high-pressure steam cleaned on site prior to beginning soil boring activities, between boring locations, if needed, any time the geoprobe leaves the project site, and at the conclusion of the drilling program.

Fifty-five gallon (DOT Specification 17) drums shall be provided by the subcontractor for temporary storage of decontamination fluids.

4.12 Decontamination Pad Construction

The subcontractor shall erect and maintain one additional temporary decontamination pad at the site, in an area designated by the TtNUS Site Representative. The pad shall be adequate to decontaminate drilling/sampling equipment and contain fluids/wastes. The pad shall be lined with polyethylene sheeting of minimum 6ml thickness and shall be constructed to slope in one direction, with a collection pump installed at the lower end of the pad.

4.13 Equipment Decontamination

The subcontractor shall bring sufficient drilling tools to complete 5 borings prior to decontaminating equipment. This does not apply to decontaminating the macro-core sampler, which is to be decontaminated between sample intervals at each boring location as specified in Section 3.3.4.

4.14 Equipment

The subcontractor shall provide a geoprobe with boring drilling capabilities to accomplish the tasks presented in this specification. This equipment includes, but is not limited to, enough drilling tools for the geoprobe to operate independently, drilling to the depths indicated in Section 4.3. The subcontractor is also encouraged to provide support personnel to conduct services such as decontamination. The subcontractor shall furnish multiple sets of 2-inch outside diameter macro-core samplers so as not to impede drilling progress during equipment decontamination.

4.15 Road Safety

The subcontractor shall provide movable barriers and appropriate signage to block of Shore Road during on street drilling operations. The subcontractor shall also provide a closed road sign at Lockhart Street indicating that Shore Road will be closed for through traffic, allowing access to the Housatonic Boat Club.

AMENDED SCOPE OF WORK
RAYMARK SITE – SHORE ROAD
STRATFORD, CONNECTICUT

ATTACHMENT A

MEASUREMENT AND PAYMENT

The following describes the various price schedule items and establishes the method of measurement or otherwise describes the content of the price schedule item.

1. Mobilization/Demobilization - includes locating all required equipment, manpower, and materials on site prior to the start of the work and removal of the same after completion. Includes decontamination of equipment prior to start of work, and construction and maintenance of decontamination facilities.

   The mobilization/demobilization activity includes conduct of utility clearance ("Call Before You Dig"), obtaining all necessary permits, compliance with all TtNUS required health and safety procedures, attendance at the 2-hour health and safety meeting at the Site prior to beginning work, and cleaning around the drill Site during and after drilling operations are completed.

   All equipment (including decontamination supplies and Level C Health and Safety equipment) intended for use at the Site shall be mobilized to the Site prior to the initiation of work. The subcontractor shall bring sufficient drilling tools to complete 5 borings prior to decontaminating.

   Any other work not specifically covered under the remaining price schedule items but necessary to perform the required work is included in the mobilization/ demobilization cost. This is a lump sum payment and includes all items described in the technical specifications regarding mobilization and demobilization. Payment will be made at the completion of the contract or as agreed between the parties.

2. DPT Drilling - This is a per foot item and payment will be made to the nearest foot drilled. The per-foot drilling price includes all equipment, material, and labor costs associated with drilling operations. The per-foot prices do not include any formation sampling costs.

3. Soil Sampling - Payment will be made on a per-sample basis. Price includes all labor, equipment and materials associated with collection of soil samples. Price also includes decontamination of sampling devices in accordance with section 4.13 of this specification.

4. Boring Abandonment - This is a per-foot item and payment will be made to the nearest foot. This item includes all labor, equipment, and materials required to abandon boreholes by backfilling with locally derived materials and the upper 6-inches with asphalt cold patch at all borings advanced through asphalt.

   There is no pay item to include abandonment of borings which are abandoned by allowing to collapse.

5. Waste Management - There are 2 pay items for waste management.

   5a. Waste Containerization – This is a per drum item and payment will be made for each drum provided, and used by the subcontractor on site. All drums used on site will remain on site.

   5b. Waste Movement – This is an hourly item that includes the time required to load, move, and unload full drums of drill cuttings and decontamination fluids to a central storage facility on site. The storage facility will be designated by TtNUS.

6. Decontamination Event - This is a payment for each decontamination event, where each event consists of decontamination of the affected portions of the DPT, and all

downhole tools, at a decontamination pad after completing 5 DPT borings, or when determined necessary by the TtNUS Site Representative. This item does not apply to decontamination of the macro-core sampler between samples intervals at a boring location.

7. Standby - This is a per-hour item, and payment will be made to the nearest half hour. Only delays caused by Tetra Tech NUS, Inc. (TtNUS) are considered standby, except that delays of less than 15 minutes for the purpose of obtaining water level measurements and depth measurements of the boring. Delays caused by unsafe weather conditions are billable standby.

BASIS OF PAYMENT

A daily summary sheet (provided by TtNUS), which details the day's activities, including drilled footage, hourly charges, etc. shall be completed and signed each day by the TtNUS and the Subcontractor's representative. This daily summary sheet shall be used to support invoices for payment for work completed.

TECHNICAL SPECIFICATION

DISPOSAL OF INVESTIGATION-DERIVED WASTE

RAYMARK OU2 - GROUNDWATER
and
RAYMARK OU4 - BALLFIELD SITE
STRATFORD, CONNECTICUT

FOR
U.S. ENVIRONMENTAL PROTECTION AGENCY

BY
TETRA TECH NUS, INC.

PROJECT NUMBERS N0003 AND N0004

SPECIFICATION NO. S98-RACI-079

November 1998

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1.0 INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS) is assisting the EPA with the disposal of investigation derived waste (IDW) resulting from field operations conducted during investigations of the Raymark Superfund Site Operable Unit No. 2 (OU2) and Operable Unit No. 4 (OU4) the ballfield located in Stratford, Connecticut. This work will be performed under Contract No. 68-W6-0045, Work Assignment Nos. 029-RICO-01H3 and 030-RICO-01H3.

TtNUS estimates that the field investigation will generate approximately 20 tons of solid (soils, rock, and sediments) IDW (approximately 60 drums), and approximately 30,000 gallons of IDW liquid which will be temporarily stored in two 21,000-gallon above-ground fractionation tanks (each tank will only be filled to the 15,000 or 16,000 mark to avoid freezing). The solid IDW will be generated during soil, rock and sediment sampling during drilling activities. The IDW liquid consists of monitoring well development water, purge water from monitoring wells, water generated from aquifer testing, and water from decontamination of drilling and sampling equipment.

Chemical analytical results from previously collected samples at Operable Unit No. 2 will be made available to the successful Subcontractor. The chemical analyses include volatile organic compounds (VOCs), metals, polychlorinated biphenyls (PCBs)/pesticides, dioxin, semivolatile organic compounds (SVOCs), asbestos, and synthetic precipitation leaching procedure (SPLP) total metals, although not every sample has been analyzed for the entire list of these contaminants. To assist the bidders in preparing the bid, a list of representative detected compounds and concentrations in soil/sediment and groundwater from OU2 is provided in Appendix B. OU4, the ballfield, is contained within the boundaries of OU2. In addition to compounds detected during field investigations, hexane, methanol, nitric acid and 2-propanol may have been used during decontamination of sampling equipment and may be present in the liquid IDW.

1.1 General Description of the Work

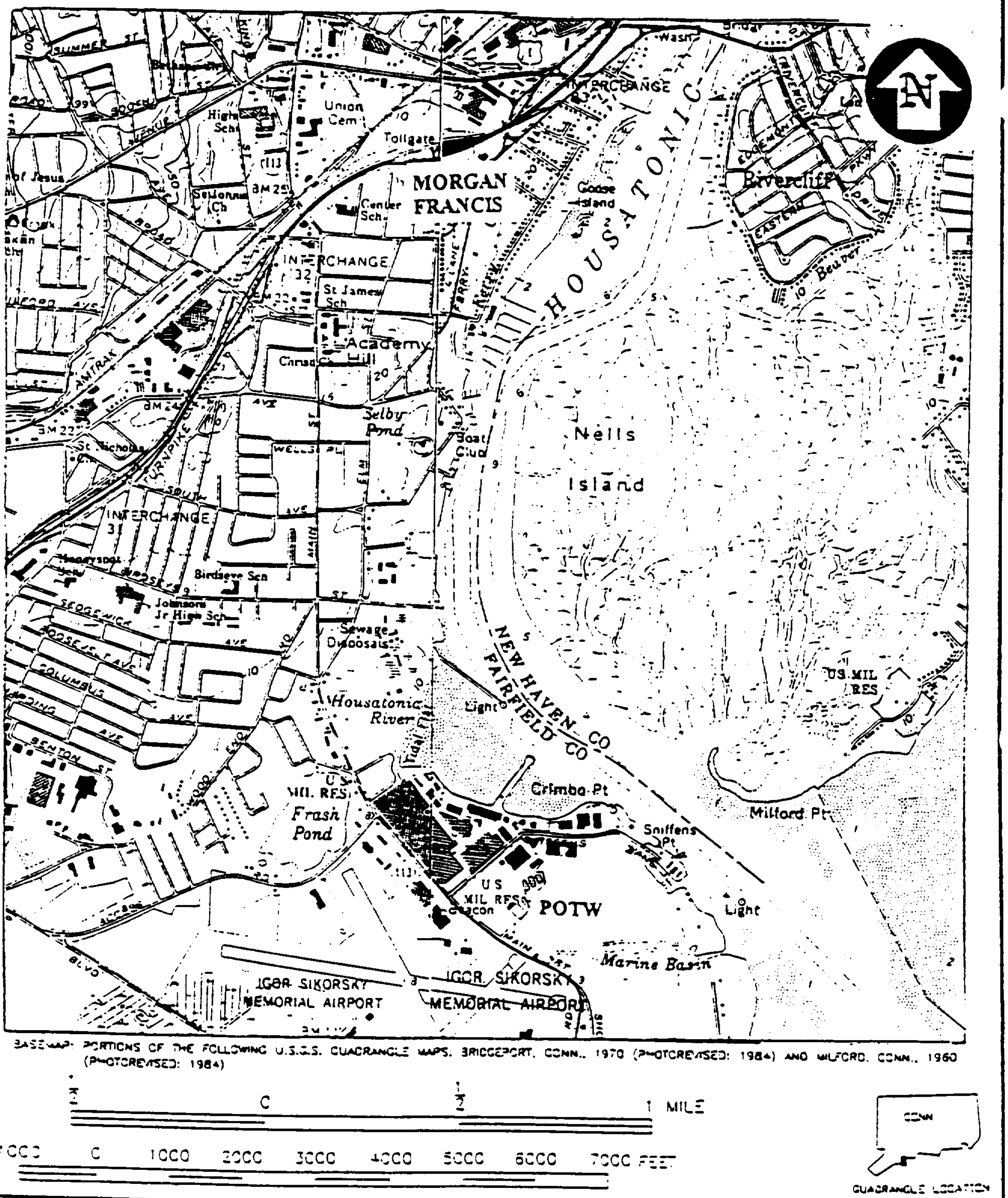
The objectives of this work are the characterization, consolidation, transport, and disposal of various IDW, and the emptying and cleaning of two on-site 21,000 gallon storage tanks, resulting from performance of field activities at the Raymark Superfund Site, Operable Units No. 2 and No. 4 in Stratford, Connecticut.

The Subcontractor shall be responsible for preparing and implementing a detailed, effective site-specific Health & Safety Plan (HASP) applicable to the IDW disposal identified in this specification.

The liquid IDW shall be disposed of by the Subcontractor at the Town of Stratford Privately Owned Treatment Works (POTW) located on Beacon Point Road. The liquid IDW will be generated from monitoring wells, aquifer testing and decontamination activities. The Subcontractor shall decontaminate the two 21,000 gallon tanks and dispose of the decontamination liquid at the POTW.

The solid IDW will be generated from soil, rock and sediment sampling during drilling activities. It will be containerized in 55 gallon drums and temporarily stored on the Morgan Francis property (see Figure 1-1). The Subcontractor will move and unload the drums into a watertight roll-off container for consolidation. A self contained decon unit shall be utilized during this procedure to minimize any dusts that might be generated during dumping. The subcontractor shall dispose of the solid IDW offsite at a licensed facility approved by TtNUS.

The drum soils produced from the field activities of Operable Units No. 2 and No. 4 shall be handled together as a unit. The Subcontractor shall consolidate the drums from each site, as necessary, and fully characterize the soils (including full TCLP analysis), and transport and properly dispose of a combined estimated 20 tons of soil. The Subcontractor shall decontaminate and dispose of the empty 55-gallon drums off Site. The Subcontractor shall decontaminate all equipment used in handling the soils and dispose of the liquid at the POTW.



BASEMAP: PORTIONS OF THE FOLLOWING U.S.G.S. QUADRANGLE MAPS: BRIDGEPORT, CONN., 1970 (PHOTOREVISED: 1984) AND MILFORD, CONN., 1960 (PHOTOREVISED: 1984)

STUDY AREA

OPERABLE UNIT NOS. 2 & 4 – IDW SPECIFICATION

RAYMARK INDUSTRIES, INC. – STRATFORD, CT

DRAWN BY	D.W. MACDOUGALL	REV.	0
CHECKED BY	M. PARKER	DATE	OCTOBER 29, 1998
SCALE	AS SHOWN	ACAD NAME: DWG\RAYMARK\USGS_MAP.DWG	

FIGURE 1–1

TETRA TECH NUS, INC.

55 Jonspin Road Wilmington, MA 01887
(978)658-7899

The Subcontractor shall furnish all labor, equipment, and materials, and carry out all operations necessary to accomplish the work in strict accordance with federal, state, and local regulations, and in accordance with these specifications. The Subcontractor shall proceed with the work in a diligent manner and make all efforts to complete the work on or before the required completion period.

1.2 Definitions

TtNUS Site Representative - The on-site TtNUS employee(s) responsible for observing and monitoring the performance of this specification by the Subcontractor, and for approving any changes.

Subcontractor - Provider of the services defined in this specification.

Project Manager - The TtNUS person responsible for implementation and execution of the project.

Staging Area - The central staging area for this project is the Morgan Francis property. TtNUS will maintain a field office trailer, frac tank, and dumpster at the Morgan Francis property. See Figure 1-1 for project orientation.

Site - The Site consists of the Raymark Facility and the surrounding residential, municipal, and commercial properties (both upgradient and downgradient) of the Raymark Facility. The OU4 ballfield under investigation is contained within the OU2 groundwater site and will be referred to as the ball field site.

1.3 Project/Site Conditions

Data and information furnished or referred to below are for the Subcontractor's information. TtNUS shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Subcontractor.

The indications of physical conditions in this specification are the result of Site investigations, and surveys. The conditions represented prevailed at the time the investigations and surveys were made. Before commencing work at the Site, the Subcontractor shall verify the existing conditions.

Location of Work

The staging area where the IDW will be temporarily stored is referred to as the Morgan Francis property located at 600 East Broadway in the Town of Stratford in Connecticut. Figure 1-1 shows the location of the Morgan Francis property. Work shall be restricted to the area(s) within the Morgan Francis property boundaries designated by TtNUS. Liquid IDW will be transported to the Stratford POTW located on Beacon Point Road in Stratford, Connecticut.

Storage Areas

Areas within the staging area are available for use by the Subcontractor for work, and the storage of equipment, materials and trailers during the life of this project. The Subcontractor shall confine its storage areas to the limits as designated or approved by TtNUS and shall be responsible for the security of the areas as well as equipment and materials. Upon completion of the contract, the Subcontractor shall remove all equipment and materials, except as otherwise specified, and restore the Site to the condition it was in at the start of the subcontract as approved by TtNUS, at no additional cost to TtNUS.

Access to Work Site

The staging area is enclosed by perimeter fencing with a locking gate, and normal access is restricted. The Subcontractor shall coordinate access through TtNUS. The Subcontractor shall provide a minimum of 24 hour notice to TtNUS of scheduled access requirements to the staging area.

Transportation Facilities

The Subcontractor shall make his own inquiries on the use of municipal, State and Federal highways, roads, streets, and bridges.

Site Utilities

No utilities or trailers are available on-site to the Subcontractor, nor will they be provided to the Subcontractor by TtNUS or by the EPA. The Subcontractor is required to provide sanitary facilities for work crews, if needed. Location of the utilities, trailers, and facilities must be approved by TtNUS prior to placement.

Subcontractor's Receipt of Supplies

The Subcontractor shall be responsible for all arrangements for the receipt of materials and supplies at the job Site. TtNUS and EPA personnel are not permitted to receive or sign for items delivered to the Site.

Organization and Rate of Progress

The Subcontractor shall employ ample personnel and sufficient equipment to accomplish the work of this contract within the execution period specified.

2.0 TECHNICAL REQUIREMENTS

The procedures described herein specify the minimum requirements necessary to conduct the work and minimize the potential of contaminant migration to the surrounding environment due to repackaging, waste consolidation, or otherwise handling of the IDW.

2.1 Equipment Requirements

This section presents a discussion of the safety equipment necessary and the handling and transportation of equipment.

2.1.1 Safety Equipment

At all times during the transport or handling of IDW drums and containers, personal protection equipment (PPE) and safety apparel shall be worn as required by the Site-specific HASP.

2.1.2 Handling and Transport Equipment

Wherever possible moving and transport of drums shall be by use of mechanical equipment. All equipment shall be Site dedicated until the completion of the work, unless approval is received from TtNUS for removal. Equipment used to handle the contaminated soil and/or the IDW liquid shall be decontaminated prior to removal from the Site.

All drum liquid transfer equipment shall be of high quality and in good repair. Extra precautions should be taken to prevent spillage during the transfer of liquids from the drums and frac tank to the tanker truck.

All licenses and tanker certifications are to be secured and satisfactory to normal federal and state DOT codes. All hoses and fittings shall also be in good repair and correctly sized for the appropriate transfer of liquid IDW.

2.2 IDW Handling

This section presents a discussion of the handling for liquid and solid IDW contained in drums and the frac tank.

2.2.1 Solid IDW

The Subcontractor shall handle the soil IDW drums from OU2 and OU4 together as one unit. As required the soil drum contents shall be consolidated for sampling and disposal purposes. Wastes and sludge from drum bottoms shall also be consolidated, as possible. All new containers shall be immediately labeled in accordance with state and federal regulations.

The Subcontractor shall sample the soil IDW as necessary to categorize wastes for disposal purposes, and/or successfully obtain waste acceptance/approval from the designated disposal facility(s). All solid waste disposal facilities must be approved by TtNUS prior to disposal.

2.2.2 Liquid IDW

It is assumed that the analytical characterization (Appendix A) of the liquid IDW is sufficient for disposal at the Town of Stratford POTW. The Subcontractor shall provide all necessary equipment for handling the liquid IDW temporarily stored in drums and the frac tank and transporting the liquid IDW to the POTW. The Subcontractor may assume that the liquid IDW does not need to be manifested to the POTW.

2.2.3 Empty Drums

The Subcontractor is responsible for the removal of all empty drums. All drums shall be emptied in accordance with RCRA standards. Empty drums shall be handled, decontaminated, transported, and disposed of off-site in compliance with applicable federal, state, and local regulations.

2.3 Frac Tank Decontamination

The frac tanks shall be decontaminated on site in accordance with Title 40, Code of Federal Regulation (CFR) Section 268.45, prior to leaving the site.

Personnel working inside and in the general vicinity of the tanks shall be trained and thoroughly familiar with the safety precautions, procedures, and equipment required for controlling the potential hazards associated with this work. Personnel shall use proper protection and safety equipment during work in and around the tanks as specified in the HASP.

The frac tanks shall be decontaminated in-place and gross contamination and sediment shall be removed from the tank interior by brushing, scraping, or prying. The tank interior shall be cleaned using a high pressure (greater than 500 psi) low volume (less than 2 gpm) water spray (or steam cleaned) until all loose scale and residue is removed and the surfaces are free of all visible contamination.

The Subcontractor shall be responsible for handling and off-site disposal of all frac tank decontamination residuals, which include sediments, decontamination fluids, and PPE.

2.4 Spill Prevention and Response

The handling and transport of drummed or tank waste, shall, at all times, be conducted in a controlled and safe manner which will minimize damage to structurally sound drums, overpacks, or other approved containers. If during transport or handling, leakage or spillage of drum waste occurs, the drum/container shall immediately be placed in an overpack unit until material transfer is accomplished. Overpack units will be provided by the Subcontractor, as required. All handling and disposal shall be conducted to prevent contamination. Subcontractor shall handle, transport, and dispose of chemical wastes, off-site, in compliance with applicable federal, state, and local regulations and at no additional cost to TtNUS.

The subcontractor shall clean up all spills and discharges, in accordance with these specifications; state, local, and federal regulations; and to the satisfaction of the TtNUS representative at no additional cost to TtNUS including labor, equipment, material, and disposal costs.

2.5 Disposal of Wastes Generated During Conduct of Work

Personal protective equipment (PPE) and decontamination pad plastics shall be discarded in doubly-lined trash bags and disposed of in an industrial dumpster provided by TtNUS. All handling and disposal shall be conducted to prevent the release or dispersal of any contamination.

2.6 Post-Construction Cleanup

The Subcontractor shall clean up all areas impacted by the Subcontractor's performance of the Specification herein and restore said areas to their condition at the start of the subcontract, subject to the satisfaction and approval of TtNUS. All equipment and materials used by or brought onsite by the Subcontractor or lower tier Subcontractors shall be removed completely from the Site at the completion of the work.

2.7 Protection of Existing Property

The Subcontractor shall collect, stage, remove, and handle drums, containers, tanks, tankers, and associated waste materials or perform other work as specified without damage or contamination to adjacent properties. Where such properties are damaged or contaminated as verified by TtNUS using visual inspection or sample analysis, the Subcontractor shall restore them to original conditions or completely decontaminate them as deemed appropriate by TtNUS. This includes inadvertent spills of wastes, dirt, dust, or debris in which levels of contamination are found to exceed regulatory limits.

2.8 Pre-Bid Conference

Potential bidders are required to attend the pre-bid on-site conference to verify Site conditions and access issues.

2.9 Documentation

The Subcontractor shall prepare and deliver to TtNUS a summary of activities on a daily basis. This report shall include itemized billable charges as set forth in the pricing schedule and a summary of waste handled (including listing quantities and final disposition). The forms will be provided by TtNUS.

3.0 SUBMITTALS

The submittals described below are those required and further described in other sections of this specification.

3.1 Health and Safety Plan (HASP)

All work shall be conducted in accordance with the site-specific HASP. The Subcontractor shall prepare and submit the HASP as specified in Section 4.0.

3.2 Project Schedule

The Project Schedule is due five days after receipt of Notice To Proceed. The project schedule shall indicate the sequence proposed to accomplish each work feature or operation, as described in the bid package and submitted in the Subcontractor's bid offering including starting and completion dates of all work features and indicating calendar days to completion. Subcontractor shall indicate operations that are critical to the timely completion of the project. This schedule will be the mechanism through which the timeliness of the Subcontractor's construction effort is appraised. When changes are authorized that result in contract time extensions, the Subcontractor shall submit a revised schedule for approval by TtNUS.

3.3 Licenses

Two copies of all licenses are due five days after receipt of Notice To Proceed. The Subcontractor shall submit copies of all licenses and permits necessary to complete the work, including but not limited to:

- Hazardous Waste Transportation License/Permits
- Certificates of Insurance as required in Contract Clauses.

3.4 Disposal Facility Information

Liquid wastes are to be transported to the Town of Stratford POTW. All conditions on waste acceptance are the responsibility of the Subcontractor. All applicable plant requirements must be adhered to by the Subcontractor. Transportation to the POTW from the Morgan Francis property is considered to be transportation "on-site" and manifesting is not required.

Two copies of Disposal Facility Information are due within five days of Subcontractor's receipt of the waste characterization data from the laboratory.

The Subcontractor shall submit the following information for the designated disposal facility(s):

- Waste Stream to be Disposed of (e.g. corrosive liquid)
- Name of the Facility
- Address
- Telephone and Fax numbers
- EPA Permit/ID Number
- State Permit/ID Number
- Type of Disposal Facility
- Primary Contact: Name and Title
- Hours of Operation

The off-site disposal of hazardous substances must comply with the CERCLA Off-site Rule (EPA OSWER Directive No. 9834.11, October 22, 1993), which establishes criteria for selecting an appropriate treatment, storage, or disposal facility, and prohibits the use of a RCRA facility for off-site management of Superfund hazardous substances if the facility has significant RCRA violations.

TtNUS and appropriate regulatory agencies will approve the acceptability of the disposal facilities. Approval of the off-site facility does not relieve the subcontractor from the responsibility for proper disposal of all wastes generated at the site.

3.5 Waste Characterization Laboratory Results

The Subcontractor shall furnish to the TtNUS Project Manager all laboratory data resulting from waste classification/characterization and analytical testing performed on wastes generated, consolidated, and/or collected during performance of the work. All laboratory testing shall meet the licensing requirements of facilities that may accept the waste. The laboratory testing results are due to the TtNUS Project Manager within five days of the Subcontractor's receipt of the data from the laboratory.

As a result of the analyses, any increase in pricing from the bid proposal must be submitted and approved prior to transport.

3.6 Submittal Procedures

The Subcontractor shall submit all items required by this specification to the TtNUS project manager. TtNUS may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. The approval of submittals by TtNUS shall not be construed as a complete check, but will indicate only that the general information is satisfactory. Approval will not relieve the Subcontractor of the responsibility for any error or omissions that may exist. After submittals have been approved by TtNUS, no resubmittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution was necessary.

The Subcontractor shall make all corrections required by TtNUS and promptly furnish a corrected submittal in the form and number of copies as specified for the initial submittal. If the Subcontractor considers any correction indicated on the submittals to constitute a change to the contract, notice as require under the Contract Clause entitled "Changes" shall be given promptly to TtNUS.

Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Adequate time (a minimum of five calendar days exclusive of mailing time) shall be allowed for each submittal for review and approval. No delays, damages or time extensions will be allowed for time lost in late submittals.

4.0 HEALTH AND SAFETY

Site activities in conjunction with this project may pose unique confined space entry and chemical and physical exposure hazards which require specialized expertise to effectively address and eliminate. The subcontractor shall be responsible for preparing and implementing a detailed, effective site-specific Health & Safety Plan (HASP) applicable to the IDW disposal and tank cleaning activities identified in this specification. At a minimum this plan shall meet the requirements, procedures and protocols set forth in this section. The subcontractor shall amend this plan as necessary to reflect proposed operations and activities associated with the proposed scope of work. Activities performed by the subcontractor are limited to the solid and liquid waste storage areas. Other areas onsite shall not be accessed by the subcontractor unless approved by TtNUS. Due to the nature of this work and safety hazards associated with this type of operation, a thorough evaluation of the work and implementation of safety procedures is necessary to reduce the potential for accidents and to minimize risks to workers.

All safety procedures, precautions, and personal protective equipment to be employed during the waste handling and disposal activities shall be specified in detail in the subcontractor's HASP. No fieldwork shall begin until the HASP has been accepted in writing by the TtNUS Project Manager. Additionally, the subcontractor shall ensure that lower tiered subcontractors, suppliers and support personnel are covered by and adhere to the site-specific HASP.

4.1 Health and Safety Plan

The subcontractor shall prepare a site-specific HASP that will govern all their activities under this project. In particular, a Confined Space Entry Plan shall be prepared to cover the tank cleaning activities as required in the specifications. The site HASP shall include at a minimum the following components as required by 29 CFR 1910.120(l)(2) and the Confined Space Entry regulation 29 CFR 1910.146:

- Site overview and site control, including a site map showing the exclusion zone, CRZ, and support zone.

- Names of key personnel and alternates responsible for site safety and health, including a Site Safety and Health Officer (SSHO), Certified Industrial Hygienist (CIH), Confined Space Entry Supervisor, Authorized Attendant and Entrants. Emergency telephone numbers, addresses, and organizations of key personnel and local emergency support services shall be listed in the plan and posted in a conspicuous place at the site.

- A safety and health (chemical and physical) hazard analysis for each site work operation.

- A Hazard Communication Program as required by 29 CFR 1910.1200.

- An Accident Prevention Plan including methods of reducing hazards.

- Employee training requirements.

- Personnel protection equipment requirements for each work operation, including types/materials, respiratory protection, air monitoring, site-specific action levels dictating decisions to upgrade or downgrade.

- Medical surveillance requirements.

- Personnel and equipment decontamination procedures.

- Emergency Response Plan and contingency procedures, including on-site first aid and emergency equipment.

- Spill containment program.

- Site postings, logs, reports, and record keeping.

The HASP shall also contain the inventory of hazardous chemical substances supplied by the subcontractor and lower tier subcontractor(s) and shall specify the location of the MSDSs at the work site.

Weather conditions can affect site work and impact on personnel safety. Work practices shall be written to account for extremes in weather conditions and the potential impact of these conditions on work safety on site and public safety off site. Procedures shall be specified to suspend or halt removal activities under given environmental conditions.

Once the HASP is accepted by TtNUS, the plan will be enforced as an addition to this specification. Any changes required in the specification as a result of the HASP shall be identified specifically in the HASP to allow for free discussion and acceptance by TtNUS prior to the start of work.

Should any unforeseen potentially hazardous condition become evident during the performance of work at the site, it shall be the subcontractor's responsibility to bring such to the attention of TtNUS for resolution both verbally within one work shift and in writing within 48 hours. In the interim, the subcontractor shall implement all necessary prudent action to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

4.2 Training and Medical Requirements

Subcontractor personnel are required to have completed the standard 40-hour and 8-hour Health and Safety Training per 29 CFR 1910.120 and per 29 CFR 1910.146. All subcontractor personnel are required to obtain medical approval to work at hazardous waste sites and wear respiratory protection, as well as document their inclusion in a medical monitoring program. Copies of training certification and medical monitoring documentation shall be provided to TtNUS prior to the start of work.

4.3 Responsibilities

The subcontractor shall utilize a Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene to review and approve the HASP and to provide the continued support for all health and safety activities as needed, including the upgrading and downgrading of personal protective equipment (PPE) levels. The qualifications of the CIH shall include at least 3 years of experience working in the hazardous waste disposal field, as well as demonstrable expertise in the development of air monitoring and PPE programs for work in potentially toxic atmospheres. The CIH must have formal training in occupational safety and health and have a working knowledge of applicable Federal and State health and safety regulations.

The subcontractor shall utilize a Site Safety and Health Officer (SSHO) and a qualified Entry Supervisor and Attendant to direct and perform on site safety and health monitoring, confined space entry, and management activities. These individuals shall have a minimum of four (4) years experience in the environmental services field. These individuals shall have the following responsibilities and authority to perform the following functions:

- Be present at all times during site operations and provide training to on-site personnel.

- Have the authority to enforce the HASP and stop operations if safety and health of personnel may be jeopardized.

- Evaluate monitoring data to make field decisions regarding safety and health.

In addition to the requirements detailed in this specification, the subcontractor shall comply with the laws, ordinances, criteria, rules, and regulations of federal, state, regional, and local authorities regarding handling, sampling, and storing of hazardous wastes. The subcontractor shall submit matters of interpretation of standards to the appropriate administrative agency for resolution before initiating work operations and, if necessary, during operations. Where the requirements of applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by TtNUS shall apply. Any disregard for the provision of these Specifications shall be deemed just and sufficient cause of termination of Contract or any subcontract without compromise or prejudice to the rights of TtNUS.

4.4 Site Orientation

Prior to beginning any work on site, the subcontractor personnel, or lower-tiered subcontractor personnel, to be assigned to work at the site shall participate in a one-time, site-specific health and safety orientation. The health and safety orientation shall be held at the site on the first scheduled day of field activity. Personnel who do not attend this meeting will not be permitted to work at the site. If the subcontractor anticipates that personnel will be substituted over the course of the work, these substitutes must attend the one-time meeting.

4.5 Personal Protection

The subcontractor shall provide Level D personal protection equipment and equipment for Level C or B upgrades as determined necessary by the site HASP action levels and the subcontractor's SSHO.

5.0 MEASUREMENT AND PAYMENT

The following describes the price schedule items and establishes the method of measurement or otherwise describes the content of the price schedule item as listed in the UNIT PRICE SCHEDULE (see Appendix B).

1. Mobilization/Demobilization

   i. Basis of Measurement - This pay item shall include all labor, material, fees, and other costs associated with providing and removing construction equipment, transportation vehicles, and decontamination facilities. This item shall include participating in the health and safety meeting at the site prior to beginning work, and cleaning around the site during and after IDW disposal activities are completed. This item shall also include all costs associated with the development of the HASP (Section 4.0) and its subsequent revisions. Any other work not specifically covered under the remaining price schedule items but necessary to perform the required work is included in the mobilization/ demobilization cost.

   ii. Basis of Payment - Payment under this item will be a lump sum cost as full compensation for all work and material required to perform mobilization/demobilization activities. Payment will be made at the completion of the contract or as agreed between the parties.

2. Waste Consolidation

   i. Basis of measurement - This pay item shall include all labor, equipment, material, fees, and other costs associated with the consolidating, packaging and labeling of liquid and solid wastes in accordance with the specifications.

ii. Basis of Payment - Payment under this item will be a lump sum cost as full compensation for all work and material required to perform waste consolidation activities.

3. Waste Characterization

i. Basis of measurement - This pay item shall include all labor, equipment, material, fees, and other costs associated with the characterization of solid wastes (including limited liquids not transported to the POTW) in accordance with the specifications.

ii. Basis of Payment - Payment under this item will be a lump sum cost as full compensation for all work and material required to perform waste characterization activities. Pricing is inclusive of all costs associated with the performance of sample collection and laboratory analyses.

4. Frac Tank Decontamination

i. Basis of measurement - This pay item shall include all labor, equipment, tools, health and safety provisions, and other costs associated with decontaminating the frac tanks in accordance with the specifications.

ii. Basis of Payment - Payment under this item will be a lump sum cost as full compensation for all work and material required to perform decontamination of the frac tanks. This item shall also include all costs associated with decontamination of all equipment and supplies.

5. <u>Liquid IDW</u>

i. Basis of Measurement - The measurement of this item shall be the total gallons of waste liquid that are properly and lawfully loaded, transported and discharged into the Town of Stratford POTW.

ii. Basis of Payment - The unit (gallon) price shall be full compensation for furnishing all labor, fuel, equipment, tools, health and safety provisions, and coordination with the disposal facility required to properly and lawfully load, transport, and discharge the waste liquid. The unit price shall include all transportation fees, taxes, and permits.

6. <u>Soil IDW Operable Unit No. 2 and Operable Unit No. 4</u>

6a. Transportation

i. Basis of Measurement - The measurement of this item shall be the total tons of solid waste that is properly and lawfully loaded transported to the approved disposal facility.

ii. Basis of Payment - The unit (ton) price shall be full compensation for furnishing all labor, fuel, equipment, tools, health and safety provisions, and coordination with the disposal facility required to properly and lawfully load and transport the solid waste. The unit price shall include all transportation fees, taxes, and permits. The tonnage shall be measured by the certified scale at the approved disposal facility.

6b. Disposal

i. Basis of Measurement - The measurement of this item shall be the total tons of solid waste that are properly and lawfully disposed of at a permitted disposal facility.

ii. Basis of Payment - The unit (ton) price shall be full compensation for disposing of the solid waste. Price shall include (but not limited to) all permits, fees, costs for in-facility handling, decontaminating drums, monitoring and other activities necessary to fulfill the terms of disposal. Waste characterization shall be included in item 3. The tonnage shall be measured by the certified scale at the approved disposal facility.

7. Empty Drum Disposal

i. Basis of Measurement - The measurement of this item shall be for each empty drum that is properly and lawfully disposed of at a permitted disposal facility.

ii. Basis of Payment - The unit (drum) price shall be full compensation for furnishing all labor, equipment, and health and safety provisions required to handle, transport, and dispose of the empty drum. Price shall include (but not limited to) all permits, fees, costs for in-facility handling, decontaminating drums, monitoring and other activities necessary to fulfill the terms of disposal. The Subcontractor shall assume a 10% increase in quantity is being generated during on going fieldwork.

APPENDIX A
DETECTED CONTAMINANTS

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
A1	ASB	Chrysotile	20	%
A1	DIOXI	1,2,3,4,6,7,8-HpCDD	4.01	UG/KG
A1	DIOXI	1,2,3,4,6,7,8-HpCDF	21.646	UG/KG
A1	DIOXI	1,2,3,4,7,8,9-HpCDF	0.266	UG/KG
A1	DIOXI	1,2,3,4,7,8-HxCDD	0.087	UG/KG
A1	DIOXI	1,2,3,4,7,8-HxCDF	12.198	UG/KG
A1	DIOXI	1,2,3,6,7,8-HxCDD	0.332	UG/KG
A1	DIOXI	1,2,3,6,7,8-HxCDF	4.445	UG/KG
A1	DIOXI	1,2,3,7,8,9-HxCDD	0.425	UG/KG
A1	DIOXI	1,2,3,7,8,9-HxCDF	0.0289	UG/KG
A1	DIOXI	1,2,3,7,8-PeCDD	0.148	UG/KG
A1	DIOXI	1,2,3,7,8-PeCDF	6.017	UG/KG
A1	DIOXI	2,3,4,6,7,8-HxCDF	7.155	UG/KG
A1	DIOXI	2,3,4,7,8-PeCDF	11.117	UG/KG
A1	DIOXI	2,3,7,8-TCDD	0.0331	UG/KG
A1	DIOXI	2,3,7,8-TCDF	6.871	UG/KG
A1	DIOXI	OCDD	31.5	UG/KG
A1	DIOXI	OCDF	7.11	UG/KG
A1	DIOXI	Total HpCDD	8.41	UG/KG
A1	DIOXI	Total HpCDF	24.069	UG/KG
A1	DIOXI	Total HxCDD	0.844	UG/KG
A1	DIOXI	Total HxCDF	44.364	UG/KG
A1	DIOXI	Total PeCDD	0.219	UG/KG
A1	DIOXI	Total PeCDF	38.504	UG/KG
A1	DIOXI	Total TCDD	0.0404	UG/KG
A1	DIOXI	Total TCDF	11.008	UG/KG
A1	DIOXI	Toxicity Equivalency Factor	9.383	UG/KG
A1	M	Aluminum	32100	MG/KG
A1	M	Antimony	13.2	MG/KG
A1	M	Arsenic	80.3	MG/KG
A1	M	Barium	10200	MG/KG
A1	M	Beryllium	1.6	MG/KG
A1	M	Cadmium	37	MG/KG
A1	M	Calcium	5980	MG/KG
A1	M	Chromium	483	MG/KG
A1	M	Cobalt	19.5	MG/KG
A1	M	Copper	29800	MG/KG
A1	M	Iron	68600	MG/KG
A1	M	Lead	19300	MG/KG
A1	M	Magnesium	35500	MG/KG
A1	M	Manganese	654	MG/KG
A1	M	Mercury	3.9	MG/KG
A1	M	Nickel	249	MG/KG
A1	M	Potassium	3520	MG/KG
A1	M	Selenium	2.4	MG/KG
A1	M	Silver	1.4	MG/KG
A1	M	Sodium	6220	MG/KG
A1	M	Thallium	3.5	MG/KG
A1	M	Vanadium	143	MG/KG
A1	M	Zinc	2000	MG/KG
A1	MS	Aluminum	42900	UG/L
A1	MS	Antimony	11.1	UG/L
A1	MS	Arsenic	140	UG/L
A1	MS	Barium	20000	UG/L
A1	MS	Beryllium	4.8	UG/L
A1	MS	Cadmium	27.9	UG/L
A1	MS	Calcium	50800	UG/L
A1	MS	Chromium	498	UG/L
A1	MS	Cobalt	177	UG/L
A1	MS	Copper	744000	UG/L
A1	MS	Iron	207000	UG/L
A1	MS	Lead	553000	UG/L
A1	MS	Magnesium	72800	UG/L
A1	MS	Manganese	2320	UG/L
A1	MS	Mercury	0.25	UG/L

Note: MS = SPLP metals OS = semivolatiles OV = volatiles
M = TAL metals MX = metal screening DIOXI = Dioxin
PCBC = PCB congeners PestP = Pesticides/PCBs

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
A1	MS	Nickel	3560	UG/L
A1	MS	Potassium	5230	UG/L
A1	MS	Sodium	20800	UG/L
A1	MS	Thallium	38.3	UG/L
A1	MS	Vanadium	245	UG/L
A1	MS	Zinc	28100	UG/L
A1	MX	Copper	38000	MG/KG
A1	MX	Lead	25000	MG/KG
A1	OS	2,4-Dimethylphenol	3800	UG/KG
A1	OS	2-Methylnaphthalene	580	UG/KG
A1	OS	2-Methylphenol	560	UG/KG
A1	OS	4-Methylphenol	810	UG/KG
A1	OS	4-Nitrophenol	80	UG/KG
A1	OS	Acenaphthene	3000	UG/KG
A1	OS	Acenaphthylene	1800	UG/KG
A1	OS	Anthracene	5200	UG/KG
A1	OS	Benzo(a)anthracene	14000	UG/KG
A1	OS	Benzo(a)pyrene	13000	UG/KG
A1	OS	Benzo(b)fluoranthene	10000	UG/KG
A1	OS	Benzo(g,h,i)Perylene	7600	UG/KG
A1	OS	Benzo(k)fluoranthene	10000	UG/KG
A1	OS	bis(2-Ethylhexyl)phthalate	12000	UG/KG
A1	OS	Butylbenzylphthalate	390	UG/KG
A1	OS	Carbazole	1200	UG/KG
A1	OS	Chrysene	14000	UG/KG
A1	OS	Di-n-Butylphthalate	1600	UG/KG
A1	OS	Di-n-octylphthalate	680	UG/KG
A1	OS	Dibenzo(a,h)Anthracene	1500	UG/KG
A1	OS	Dibenzofuran	1200	UG/KG
A1	OS	Diethylphthalate	72	UG/KG
A1	OS	Dimethylphthalate	67	UG/KG
A1	OS	Fluoranthene	33000	UG/KG
A1	OS	Fluorene	3800	UG/KG
A1	OS	Indeno(1,2,3-cd)pyrene	7000	UG/KG
A1	OS	N-Nitroso-diphenylamine	1300	UG/KG
A1	OS	Naphthalene	1100	UG/KG
A1	OS	Pentachlorophenol	30	UG/KG
A1	OS	Phenanthrene	24000	UG/KG
A1	OS	Phenol	9800	UG/KG
A1	OS	Pyrene	31000	UG/KG
A1	OV	1,1-Dichloroethane	11	UG/KG
A1	OV	1,1-Dichloroethene	2	UG/KG
A1	OV	1,2-Dichloroethene	5	UG/KG
A1	OV	2-Butanone	43	UG/KG
A1	OV	2-Hexanone	40	UG/KG
A1	OV	Acetone	270	UG/KG
A1	OV	Benzene	3	UG/KG
A1	OV	Chlorobenzene	32	UG/KG
A1	OV	Ethylbenzene	12	UG/KG
A1	OV	Toluene	250	UG/KG
A1	OV	Total Xylenes	100	UG/KG
A1	OV	Vinyl Chloride	6	UG/KG
A1	PCBC	2',3,4,4',5-Pentachlorobiphenyl (123)	8590	NG/KG
A1	PCBC	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	205000	NG/KG
A1	PCBC	2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	35300	NG/KG
A1	PCBC	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	958	NG/KG
A1	PCBC	2,3,3',4,4',5'-Hexachlorobiphenyl (157)	4160	NG/KG
A1	PCBC	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	2150	NG/KG
A1	PCBC	2,3,3',4,4',5-Hexachlorobiphenyl (156)	2810	NG/KG
A1	PCBC	2,3,3',4,4'-Pentachlorobiphenyl (105)	4230	NG/KG
A1	PCBC	2,3,4,4',5-Pentachlorobiphenyl (114)	26000	NG/KG
A1	PCBC	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	131	NG/KG
A1	PCBC	3,3',4,4',5-Pentachlorobiphenyl (126)	238	NG/KG
A1	PCBC	3,3',4,4'-Tetrachlorobiphenyl (77)	826	NG/KG
A1	PCBC	Decachlorobiphenyl	45900	NG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
A1	PCBC	Total Dichlorobiphenyls	6870	NG/KG
A1	PCBC	Total Heptachlorobiphenyls	746000	NG/KG
A1	PCBC	Total Hexachlorobiphenyls	302000	NG/KG
A1	PCBC	Total Nonachlorobiphenyls	64500	NG/KG
A1	PCBC	Total Octachlorobiphenyls	805000	NG/KG
A1	PCBC	Total Pentachlorobiphenyls	239000	NG/KG
A1	PCBC	Total Tetrachlorobiphenyls	191000	NG/KG
A1	PCBC	Total Trichlorobiphenyls	80900	NG/KG
A1	PESTP	4,4'-DDD	21	UG/KG
A1	PESTP	4,4'-DDE	12	UG/KG
A1	PESTP	4,4'-DDT	18	UG/KG
A1	PESTP	Aldrin	11	UG/KG
A1	PESTP	alpha-BHC	7.8	UG/KG
A1	PESTP	alpha-Chlordane	19	UG/KG
A1	PESTP	Aroclor-1248	190	UG/KG
A1	PESTP	Aroclor-1262	21000	UG/KG
A1	PESTP	Aroclor-1268	30000	UG/KG
A1	PESTP	beta-BHC	1.1	UG/KG
A1	PESTP	delta-BHC	2.3	UG/KG
A1	PESTP	Dieldrin	14	UG/KG
A1	PESTP	Endosulfan I	7.4	UG/KG
A1	PESTP	Endosulfan II	22	UG/KG
A1	PESTP	Endosulfan Sulfate	28	UG/KG
A1	PESTP	Endrin	25	UG/KG
A1	PESTP	Endrin Aldehyde	93	UG/KG
A1	PESTP	Endrin Ketone	12	UG/KG
A1	PESTP	gamma-BHC	5.6	UG/KG
A1	PESTP	gamma-Chlordane	16	UG/KG
A1	PESTP	Heptachlor	7	UG/KG
A1	PESTP	Heptachlor Epoxide	1.3	UG/KG
A1	PESTP	Methoxychlor	3.6	UG/KG
A1	TOC	Total Organic Carbon	84600	MG/KG
A2	ASB	Chrysotile	5	%
A2	DIOXI	1,2,3,4,6,7,8-HpCDD	1.715	UG/KG
A2	DIOXI	1,2,3,4,6,7,8-HpCDF	5.193	UG/KG
A2	DIOXI	1,2,3,4,7,8,9-HpCDF	0.105	UG/KG
A2	DIOXI	1,2,3,4,7,8-HxCDD	0.0159	UG/KG
A2	DIOXI	1,2,3,4,7,8-HxCDF	3.78	UG/KG
A2	DIOXI	1,2,3,6,7,8-HxCDD	0.0879	UG/KG
A2	DIOXI	1,2,3,6,7,8-HxCDF	1.54	UG/KG
A2	DIOXI	1,2,3,7,8,9-HxCDD	0.0745	UG/KG
A2	DIOXI	1,2,3,7,8,9-HxCDF	0.00963	UG/KG
A2	DIOXI	1,2,3,7,8-PeCDD	0.0206	UG/KG
A2	DIOXI	1,2,3,7,8-PeCDF	2.544	UG/KG
A2	DIOXI	2,3,4,6,7,8-HxCDF	2.656	UG/KG
A2	DIOXI	2,3,4,7,8-PeCDF	4.554	UG/KG
A2	DIOXI	2,3,7,8-TCDD	0.00494	UG/KG
A2	DIOXI	2,3,7,8-TCDF	3.686	UG/KG
A2	DIOXI	OCDD	7.349	UG/KG
A2	DIOXI	OCDF	1.473	UG/KG
A2	DIOXI	Total HpCDD	3.001	UG/KG
A2	DIOXI	Total HpCDF	6.004	UG/KG
A2	DIOXI	Total HxCDD	0.723	UG/KG
A2	DIOXI	Total HxCDF	13.895	UG/KG
A2	DIOXI	Total PeCDD	0.194	UG/KG
A2	DIOXI	Total PeCDF	19.226	UG/KG
A2	DIOXI	Total TCDD	0.00494	UG/KG
A2	DIOXI	Total TCDF	6.028	UG/KG
A2	DIOXI	Toxicity Equivalency Factor	3.682	UG/KG
A2	M	Aluminum	20000	MG/KG
A2	M	Arsenic	44.5	MG/KG
A2	M	Barium	9690	MG/KG
A2	M	Beryllium	0.92	MG/KG
A2	M	Cadmium	1.9	MG/KG
A2	M	Calcium	52800	MG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
A2	M	Chromium	120	MG/KG
A2	M	Cobalt	22.4	MG/KG
A2	M	Copper	26900	MG/KG
A2	M	Iron	29500	MG/KG
A2	M	Lead	22000	MG/KG
A2	M	Magnesium	44300	MG/KG
A2	M	Manganese	1050	MG/KG
A2	M	Mercury	0.9	MG/KG
A2	M	Nickel	333	MG/KG
A2	M	Potassium	3640	MG/KG
A2	M	Selenium	0.47	MG/KG
A2	M	Silver	0.77	MG/KG
A2	M	Sodium	17000	MG/KG
A2	M	Thallium	2.6	MG/KG
A2	M	Vanadium	49.4	MG/KG
A2	M	Zinc	3080	MG/KG
A2	MS	Aluminum	25600	UG/L
A2	MS	Antimony	15.3	UG/L
A2	MS	Arsenic	65.8	UG/L
A2	MS	Barium	720	UG/L
A2	MS	Beryllium	5.6	UG/L
A2	MS	Cadmium	21.1	UG/L
A2	MS	Calcium	73800	UG/L
A2	MS	Chromium	1060	UG/L
A2	MS	Cobalt	45.8	UG/L
A2	MS	Copper	5190	UG/L
A2	MS	Iron	63100	UG/L
A2	MS	Lead	1760	UG/L
A2	MS	Magnesium	10100	UG/L
A2	MS	Manganese	2100	UG/L
A2	MS	Mercury	1.5	UG/L
A2	MS	Nickel	146	UG/L
A2	MS	Potassium	4980	UG/L
A2	MS	Selenium	8.2	UG/L
A2	MS	Sodium	18200	UG/L
A2	MS	Vanadium	170	UG/L
A2	MS	Zinc	4610	UG/L
A2	MX	Copper	40000	MG/KG
A2	MX	Lead	24000	MG/KG
A2	OS	1,4-Dichlorobenzene	66	UG/KG
A2	OS	2,4-Dimethylphenol	11000	UG/KG
A2	OS	2-Methylnaphthalene	1700	UG/KG
A2	OS	2-Methylphenol	1500	UG/KG
A2	OS	4-Methylphenol	7200	UG/KG
A2	OS	Acenaphthene	3700	UG/KG
A2	OS	Acenaphthylene	2100	UG/KG
A2	OS	Anthracene	5900	UG/KG
A2	OS	Benzo(a)anthracene	9100	UG/KG
A2	OS	Benzo(a)pyrene	9100	UG/KG
A2	OS	Benzo(b)fluoranthene	6200	UG/KG
A2	OS	Benzo(g,h,i)Perylene	4300	UG/KG
A2	OS	Benzo(k)fluoranthene	6300	UG/KG
A2	OS	bis(2-Ethylhexyl)phthalate	350	UG/KG
A2	OS	Carbazole	4800	UG/KG
A2	OS	Chrysene	11000	UG/KG
A2	OS	Di-n-Butylphthalate	1600	UG/KG
A2	OS	Di-n-octylphthalate	30	UG/KG
A2	OS	Dibenzo(a,h)Anthracene	2300	UG/KG
A2	OS	Dibenzofuran	3200	UG/KG
A2	OS	Fluoranthene	23000	UG/KG
A2	OS	Fluorene	6500	UG/KG
A2	OS	Indeno(1,2,3-cd)pyrene	4600	UG/KG
A2	OS	N-Nitroso-diphenylamine	1600	UG/KG
A2	OS	Naphthalene	3700	UG/KG
A2	OS	Phenanthrene	21000	UG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB_RESULT	UNITS
A2	OS	Phenol	2300	UG/KG
A2	OS	Pyrene	23000	UG/KG
A2	OV	Acetone	1400	UG/KG
A2	OV	Benzene	330	UG/KG
A2	OV	Ethylbenzene	1000	UG/KG
A2	OV	Methylene Chloride	14	UG/KG
A2	OV	Toluene	320	UG/KG
A2	OV	Total Xylenes	1800	UG/KG
A2	PESTP	4,4'-DDD	7.2	UG/KG
A2	PESTP	alpha-Chlordane	3.9	UG/KG
A2	PESTP	Aroclor-1248	1200	UG/KG
A2	PESTP	Aroclor-1262	24000	UG/KG
A2	PESTP	Aroclor-1268	39000	UG/KG
A2	PESTP	Dieldrin	28	UG/KG
A2	PESTP	Endosulfan II	8.3	UG/KG
A2	PESTP	Endrin Aldehyde	2000	UG/KG
A2	PESTP	Endrin Ketone	10	UG/KG
A2	PESTP	gamma-Chlordane	11	UG/KG
A2	PESTP	Heptachlor	2.7	UG/KG
A3	ASB	Chrysotile	20	%
A3	DIOXI	1,2,3,4,6,7,8-HpCDD	4.153	UG/KG
A3	DIOXI	1,2,3,4,6,7,8-HpCDF	29.425	UG/KG
A3	DIOXI	1,2,3,4,7,8,9-HpCDF	0.227	UG/KG
A3	DIOXI	1,2,3,4,7,8-HxCDD	0.0302	UG/KG
A3	DIOXI	1,2,3,4,7,8-HxCDF	12.024	UG/KG
A3	DIOXI	1,2,3,6,7,8-HxCDD	0.175	UG/KG
A3	DIOXI	1,2,3,6,7,8-HxCDF	3.887	UG/KG
A3	DIOXI	1,2,3,7,8,9-HxCDD	0.167	UG/KG
A3	DIOXI	1,2,3,7,8,9-HxCDF	0.016	UG/KG
A3	DIOXI	1,2,3,7,8-PeCDD	0.0372	UG/KG
A3	DIOXI	1,2,3,7,8-PeCDF	6.777	UG/KG
A3	DIOXI	2,3,4,6,7,8-HxCDF	6.918	UG/KG
A3	DIOXI	2,3,4,7,8-PeCDF	13.003	UG/KG
A3	DIOXI	2,3,7,8-TCDD	0.00936	UG/KG
A3	DIOXI	2,3,7,8-TCDF	9.93	UG/KG
A3	DIOXI	OCDD	16	UG/KG
A3	DIOXI	OCDF	3.637	UG/KG
A3	DIOXI	Total HpCDD	7.051	UG/KG
A3	DIOXI	Total HpCDF	32.044	UG/KG
A3	DIOXI	Total HxCDD	1.26	UG/KG
A3	DIOXI	Total HxCDF	49.227	UG/KG
A3	DIOXI	Total PeCDD	0.066	UG/KG
A3	DIOXI	Total PeCDF	45.782	UG/KG
A3	DIOXI	Total TCDD	0.00936	UG/KG
A3	DIOXI	Total TCDF	14.926	UG/KG
A3	DIOXI	Toxicity Equivalency Factor	10.539	UG/KG
A3	M	Aluminum	24300	MG/KG
A3	M	Antimony	13	MG/KG
A3	M	Arsenic	17.3	MG/KG
A3	M	Barium	12300	MG/KG
A3	M	Beryllium	1.1	MG/KG
A3	M	Cadmium	16.8	MG/KG
A3	M	Calcium	30700	MG/KG
A3	M	Chromium	730	MG/KG
A3	M	Cobalt	46.8	MG/KG
A3	M	Copper	29600	MG/KG
A3	M	Iron	48500	MG/KG
A3	M	Lead	35400	MG/KG
A3	M	Magnesium	95400	MG/KG
A3	M	Manganese	547	MG/KG
A3	M	Mercury	1.8	MG/KG
A3	M	Nickel	580	MG/KG
A3	M	Potassium	4330	MG/KG
A3	M	Selenium	2	MG/KG
A3	M	Silver	4.2	MG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
A3	M	Sodium	9320	MG/KG
A3	M	Thallium	3.9	MG/KG
A3	M	Vanadium	73.5	MG/KG
A3	M	Zinc	4800	MG/KG
A3	MS	Aluminum	50900	UG/L
A3	MS	Antimony	10.3	UG/L
A3	MS	Arsenic	92.2	UG/L
A3	MS	Barium	11500	UG/L
A3	MS	Beryllium	5.6	UG/L
A3	MS	Cadmium	22.4	UG/L
A3	MS	Calcium	429000	UG/L
A3	MS	Chromium	286	UG/L
A3	MS	Cobalt	121	UG/L
A3	MS	Copper	131000	UG/L
A3	MS	Iron	84900	UG/L
A3	MS	Lead	603000	UG/L
A3	MS	Magnesium	51600	UG/L
A3	MS	Manganese	3710	UG/L
A3	MS	Mercury	0.36	UG/L
A3	MS	Nickel	1910	UG/L
A3	MS	Potassium	6280	UG/L
A3	MS	Selenium	5.5	UG/L
A3	MS	Sodium	34000	UG/L
A3	MS	Thallium	21.9	UG/L
A3	MS	Vanadium	377	UG/L
A3	MS	Zinc	59600	UG/L
A3	MX	Copper	2000	MG/KG
A3	MX	Lead	1600	MG/KG
A3	OS	2,4-Dimethylphenol	11000	UG/KG
A3	OS	2-Methylnaphthalene	1000	UG/KG
A3	OS	2-Methylphenol	390	UG/KG
A3	OS	4-Methylphenol	850	UG/KG
A3	OS	Acenaphthene	990	UG/KG
A3	OS	Acenaphthylene	240	UG/KG
A3	OS	Anthracene	2400	UG/KG
A3	OS	Benzo(a)anthracene	2900	UG/KG
A3	OS	Benzo(a)pyrene	3100	UG/KG
A3	OS	Benzo(b)fluoranthene	7900	UG/KG
A3	OS	Benzo(g,h,i)Perylene	1900	UG/KG
A3	OS	Benzo(k)fluoranthene	7500	UG/KG
A3	OS	bis(2-Ethylhexyl)phthalate	38000	UG/KG
A3	OS	Butylbenzylphthalate	1700	UG/KG
A3	OS	Carbazole	1200	UG/KG
A3	OS	Chrysene	3300	UG/KG
A3	OS	Di-n-Butylphthalate	1300	UG/KG
A3	OS	Di-n-octylphthalate	1100	UG/KG
A3	OS	Dibenzo(a,h)Anthracene	610	UG/KG
A3	OS	Dibenzofuran	770	UG/KG
A3	OS	Dimethylphthalate	820	UG/KG
A3	OS	Fluoranthene	9200	UG/KG
A3	OS	Fluorene	1200	UG/KG
A3	OS	Indeno(1,2,3-cd)pyrene	1500	UG/KG
A3	OS	N-Nitroso-diphenylamine	2900	UG/KG
A3	OS	Naphthalene	1400	UG/KG
A3	OS	Phenanthrene	8800	UG/KG
A3	OS	Phenol	2000	UG/KG
A3	OS	Pyrene	8200	UG/KG
A3	OV	Acetone	220	UG/KG
A3	OV	Carbon Disulfide	6	UG/KG
A3	OV	Methylene Chloride	7	UG/KG
A3	OV	Toluene	3	UG/KG
A3	PCBC	2',3,4,4',5-Pentachlorobiphenyl (123)	43400	NG/KG
A3	PCBC	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	1020000	NG/KG
A3	PCBC	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	4950	NG/KG
A3	PCBC	2,3',4,4',5-Pentachlorobiphenyl (118)	5470	NG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
A3	PCBC	2,3,3',4,4',5'-Hexachlorobiphenyl (157)	8870	NG/KG
A3	PCBC	2,3,3',4,4',5-Hexachlorobiphenyl (156)	42200	NG/KG
A3	PCBC	2,3,3',4,4'-Pentachlorobiphenyl (105)	209	NG/KG
A3	PCBC	2,3,4,4',5-Pentachlorobiphenyl (114)	108000	NG/KG
A3	PCBC	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	1280	NG/KG
A3	PCBC	3,3',4,4'-Tetrachlorobiphenyl (77)	8010	NG/KG
A3	PCBC	Decachlorobiphenyl	382000	NG/KG
A3	PCBC	Total Dichlorobiphenyls	93500	NG/KG
A3	PCBC	Total Heptachlorobiphenyls	6890000	NG/KG
A3	PCBC	Total Hexachlorobiphenyls	1770000	NG/KG
A3	PCBC	Total Monochlorobiphenyls	4920	NG/KG
A3	PCBC	Total Nonachlorobiphenyls	554000	NG/KG
A3	PCBC	Total Octachlorobiphenyls	6270000	NG/KG
A3	PCBC	Total Pentachlorobiphenyls	995000	NG/KG
A3	PCBC	Total Tetrachlorobiphenyls	662000	NG/KG
A3	PCBC	Total Trichlorobiphenyls	404000	NG/KG
A3	PESTP	4,4'-DDD	41	UG/KG
A3	PESTP	4,4'-DDE	30	UG/KG
A3	PESTP	4,4'-DDT	110	UG/KG
A3	PESTP	Aldrin	12	UG/KG
A3	PESTP	alpha-BHC	4.4	UG/KG
A3	PESTP	alpha-Chlordane	6.1	UG/KG
A3	PESTP	Aroclor-1262	68000	UG/KG
A3	PESTP	Aroclor-1268	60000	UG/KG
A3	PESTP	delta-BHC	4.6	UG/KG
A3	PESTP	Dieldrin	8	UG/KG
A3	PESTP	Endosulfan I	21	UG/KG
A3	PESTP	Endosulfan II	0.7	UG/KG
A3	PESTP	Endosulfan Sulfate	14	UG/KG
A3	PESTP	Endrin	92	UG/KG
A3	PESTP	Endrin Aldehyde	520	UG/KG
A3	PESTP	Endrin Ketone	8.9	UG/KG
A3	PESTP	gamma-BHC	2.1	UG/KG
A3	PESTP	gamma-Chlordane	38	UG/KG
A3	PESTP	Heptachlor	2.8	UG/KG
A3	PESTP	Heptachlor Epoxide	2.5	UG/KG
A3	TOC	Total Organic Carbon	1320000	MG/KG
B	ASB	Chrysotile	1	%
B	DIOXI	1,2,3,4,6,7,8-HpCDD	0.431	UG/KG
B	DIOXI	1,2,3,4,6,7,8-HpCDF	1.449	UG/KG
B	DIOXI	1,2,3,4,7,8,9-HpCDF	0.0165	UG/KG
B	DIOXI	1,2,3,4,7,8-HxCDD	0.00451	UG/KG
B	DIOXI	1,2,3,4,7,8-HxCDF	0.138	UG/KG
B	DIOXI	1,2,3,6,7,8-HxCDD	0.0186	UG/KG
B	DIOXI	1,2,3,6,7,8-HxCDF	0.0503	UG/KG
B	DIOXI	1,2,3,7,8,9-HxCDD	0.0154	UG/KG
B	DIOXI	1,2,3,7,8-PeCDD	0.00595	UG/KG
B	DIOXI	1,2,3,7,8-PeCDF	0.0667	UG/KG
B	DIOXI	2,3,4,6,7,8-HxCDF	0.085	UG/KG
B	DIOXI	2,3,4,7,8-PeCDF	0.13	UG/KG
B	DIOXI	2,3,7,8-TCDD	0.00319	UG/KG
B	DIOXI	2,3,7,8-TCDF	0.078	UG/KG
B	DIOXI	OCDD	5.245	UG/KG
B	DIOXI	OCDF	6.408	UG/KG
B	DIOXI	Total HpCDD	1.114	UG/KG
B	DIOXI	Total HpCDF	4.768	UG/KG
B	DIOXI	Total HxCDD	0.166	UG/KG
B	DIOXI	Total HxCDF	0.773	UG/KG
B	DIOXI	Total PeCDD	0.0243	UG/KG
B	DIOXI	Total PeCDF	0.512	UG/KG
B	DIOXI	Total TCDD	0.00319	UG/KG
B	DIOXI	Total TCDF	0.157	UG/KG
B	DIOXI	Toxicity Equivalency Factor	0.115	UG/KG
B	M	Aluminum	22500	MG/KG
B	M	Antimony	12.8	MG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
B	M	Arsenic	20.1	MG/KG
B	M	Barium	2780	MG/KG
B	M	Beryllium	1.4	MG/KG
B	M	Cadmium	55.5	MG/KG
B	M	Calcium	15900	MG/KG
B	M	Chromium	793	MG/KG
B	M	Cobalt	20	MG/KG
B	M	Copper	3450	MG/KG
B	M	Iron	53700	MG/KG
B	M	Lead	4030	MG/KG
B	M	Magnesium	19000	MG/KG
B	M	Manganese	594	MG/KG
B	M	Mercury	1.4	MG/KG
B	M	Nickel	381	MG/KG
B	M	Potassium	4950	MG/KG
B	M	Selenium	4	MG/KG
B	M	Silver	5	MG/KG
B	M	Sodium	29000	MG/KG
B	M	Thallium	2.2	MG/KG
B	M	Vanadium	90.2	MG/KG
B	M	Zinc	3670	MG/KG
B	MS	Aluminum	72900	UG/L
B	MS	Antimony	51.4	UG/L
B	MS	Arsenic	112	UG/L
B	MS	Barium	3770	UG/L
B	MS	Beryllium	13.8	UG/L
B	MS	Cadmium	149	UG/L
B	MS	Calcium	295000	UG/L
B	MS	Chromium	3270	UG/L
B	MS	Cobalt	132	UG/L
B	MS	Copper	14600	UG/L
B	MS	Iron	112000	UG/L
B	MS	Lead	14600	UG/L
B	MS	Magnesium	31600	UG/L
B	MS	Manganese	4020	UG/L
B	MS	Mercury	2.1	UG/L
B	MS	Nickel	630	UG/L
B	MS	Potassium	21700	UG/L
B	MS	Sodium	187000	UG/L
B	MS	Thallium	9.3	UG/L
B	MS	Vanadium	492	UG/L
B	MS	Zinc	10300	UG/L
B	MX	Copper	1800	MG/KG
B	MX	Lead	2000	MG/KG
B	OS	2,4-Dimethylphenol	4100	UG/KG
B	OS	2-Methylnaphthalene	620	UG/KG
B	OS	2-Methylphenol	680	UG/KG
B	OS	4-Methylphenol	1400	UG/KG
B	OS	Acenaphthene	320	UG/KG
B	OS	Acenaphthylene	4300	UG/KG
B	OS	Anthracene	3300	UG/KG
B	OS	Benzo(a)anthracene	9400	UG/KG
B	OS	Benzo(a)pyrene	13000	UG/KG
B	OS	Benzo(b)fluoranthene	13000	UG/KG
B	OS	Benzo(g,h,i)Perylene	5300	UG/KG
B	OS	Benzo(k)fluoranthene	4600	UG/KG
B	OS	bis(2-Ethylhexyl)phthalate	66000	UG/KG
B	OS	Butylbenzylphthalate	160	UG/KG
B	OS	Carbazole	940	UG/KG
B	OS	Chrysene	15000	UG/KG
B	OS	Di-n-Butylphthalate	320	UG/KG
B	OS	Di-n-octylphthalate	3500	UG/KG
B	OS	Dibenzo(a,h)Anthracene	510	UG/KG
B	OS	Dibenzofuran	320	UG/KG
B	OS	Dimethylphthalate	2900	UG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
B	OS	Fluoranthene	21000	UG/KG
B	OS	Fluorene	670	UG/KG
B	OS	Indeno(1,2,3-cd)pyrene	4500	UG/KG
B	OS	N-Nitroso-diphenylamine	2500	UG/KG
B	OS	Naphthalene	360	UG/KG
B	OS	Pentachlorophenol	200	UG/KG
B	OS	Phenanthrene	10000	UG/KG
B	OS	Phenol	1200	UG/KG
B	OS	Pyrene	20000	UG/KG
B	OV	2-Butanone	1300	UG/KG
B	OV	Acetone	4100	UG/KG
B	OV	Benzene	74	UG/KG
B	OV	Carbon Disulfide	20	UG/KG
B	OV	Chlorobenzene	260	UG/KG
B	OV	Total Xylenes	26	UG/KG
B	PESTP	4,4'-DDD	2100	UG/KG
B	PESTP	4,4'-DDE	39	UG/KG
B	PESTP	4,4'-DDT	160	UG/KG
B	PESTP	Aldrin	22	UG/KG
B	PESTP	alpha-BHC	1.3	UG/KG
B	PESTP	alpha-Chlordane	1200	UG/KG
B	PESTP	Aroclor-1248	1400	UG/KG
B	PESTP	Aroclor-1254	77000	UG/KG
B	PESTP	Aroclor-1262	10000	UG/KG
B	PESTP	Aroclor-1268	11000	UG/KG
B	PESTP	delta-BHC	2.4	UG/KG
B	PESTP	Dieldrin	2600	UG/KG
B	PESTP	Endosulfan I	9.6	UG/KG
B	PESTP	Endosulfan II	2.6	UG/KG
B	PESTP	Endosulfan Sulfate	16	UG/KG
B	PESTP	Endrin	60	UG/KG
B	PESTP	Endrin Aldehyde	49	UG/KG
B	PESTP	Endrin Ketone	6.9	UG/KG
B	PESTP	gamma-BHC	0.46	UG/KG
B	PESTP	gamma-Chlordane	63	UG/KG
B	PESTP	Heptachlor	1.8	UG/KG
B	PESTP	Heptachlor Epoxide	6.1	UG/KG
B	PESTP	Methoxychlor	1.5	UG/KG
B	TOC	Total Organic Carbon	928000	MG/KG
C	ASB	Chrysotile	1	%
C	DIOXI	1,2,3,4,6,7,8-HpCDD	0.168	UG/KG
C	DIOXI	1,2,3,4,6,7,8-HpCDF	0.197	UG/KG
C	DIOXI	1,2,3,4,7,8,9-HpCDF	0.0043	UG/KG
C	DIOXI	1,2,3,4,7,8-HxCDD	0.00248	UG/KG
C	DIOXI	1,2,3,4,7,8-HxCDF	0.0364	UG/KG
C	DIOXI	1,2,3,6,7,8-HxCDD	0.00741	UG/KG
C	DIOXI	1,2,3,6,7,8-HxCDF	0.0128	UG/KG
C	DIOXI	1,2,3,7,8,9-HxCDD	0.00627	UG/KG
C	DIOXI	1,2,3,7,8,9-HxCDF	0.000367	UG/KG
C	DIOXI	1,2,3,7,8-PeCDD	0.00221	UG/KG
C	DIOXI	1,2,3,7,8-PeCDF	0.0153	UG/KG
C	DIOXI	2,3,4,6,7,8-HxCDF	0.0195	UG/KG
C	DIOXI	2,3,4,7,8-PeCDF	0.0241	UG/KG
C	DIOXI	2,3,7,8-TCDD	0.000797	UG/KG
C	DIOXI	2,3,7,8-TCDF	0.0258	UG/KG
C	DIOXI	OCDD	2.84038	UG/KG
C	DIOXI	OCDF	0.692	UG/KG
C	DIOXI	Total HpCDD	0.407	UG/KG
C	DIOXI	Total HpCDF	0.365	UG/KG
C	DIOXI	Total HxCDD	0.0797	UG/KG
C	DIOXI	Total HxCDF	0.2	UG/KG
C	DIOXI	Total PeCDD	0.00653	UG/KG
C	DIOXI	Total PeCDF	0.102	UG/KG
C	DIOXI	Total TCDD	0.000269	UG/KG
C	DIOXI	Total TCDF	0.0321	UG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
C	DIOXI	Toxicity Equivalency Factor	0.0325	UG/KG
C	M	Aluminum	21600	MG/KG
C	M	Antimony	13.9	MG/KG
C	M	Arsenic	17	MG/KG
C	M	Barium	577	MG/KG
C	M	Beryllium	0.98	MG/KG
C	M	Cadmium	5.3	MG/KG
C	M	Calcium	58200	MG/KG
C	M	Chromium	950	MG/KG
C	M	Cobalt	19	MG/KG
C	M	Copper	2360	MG/KG
C	M	Iron	43000	MG/KG
C	M	Lead	1180	MG/KG
C	M	Magnesium	11700	MG/KG
C	M	Manganese	566	MG/KG
C	M	Mercury	1.3	MG/KG
C	M	Nickel	86.1	MG/KG
C	M	Potassium	5250	MG/KG
C	M	Selenium	2.4	MG/KG
C	M	Silver	4.6	MG/KG
C	M	Sodium	11200	MG/KG
C	M	Thallium	3.4	MG/KG
C	M	Vanadium	68.1	MG/KG
C	M	Zinc	1190	MG/KG
C	MS	Aluminum	8980	UG/L
C	MS	Arsenic	15.8	UG/L
C	MS	Barium	112	UG/L
C	MS	Calcium	13700	UG/L
C	MS	Chromium	7	UG/L
C	MS	Cobalt	13.1	UG/L
C	MS	Copper	104	UG/L
C	MS	Iron	10300	UG/L
C	MS	Lead	124	UG/L
C	MS	Magnesium	4130	UG/L
C	MS	Manganese	462	UG/L
C	MS	Nickel	15.2	UG/L
C	MS	Potassium	10600	UG/L
C	MS	Sodium	661	UG/L
C	MS	Vanadium	23.7	UG/L
C	MS	Zinc	77.8	UG/L
C	OS	2-Methylnaphthalene	85	UG/KG
C	OS	4-Methylphenol	81	UG/KG
C	OS	Acenaphthene	150	UG/KG
C	OS	Acenaphthylene	260	UG/KG
C	OS	Anthracene	430	UG/KG
C	OS	Benzo(a)anthracene	1500	UG/KG
C	OS	Benzo(a)pyrene	1600	UG/KG
C	OS	Benzo(b)fluoranthene	2300	UG/KG
C	OS	Benzo(g,h,i)Perylene	720	UG/KG
C	OS	Benzo(k)fluoranthene	2200	UG/KG
C	OS	Butylbenzylphthalate	350	UG/KG
C	OS	Carbazole	110	UG/KG
C	OS	Chrysene	1800	UG/KG
C	OS	Di-n-Butylphthalate	65	UG/KG
C	OS	Dibenzo(a,h)Anthracene	270	UG/KG
C	OS	Fluoranthene	3800	UG/KG
C	OS	Fluorene	190	UG/KG
C	OS	Indeno(1,2,3-cd)pyrene	700	UG/KG
C	OS	N-Nitroso-diphenylamine	750	UG/KG
C	OS	Naphthalene	130	UG/KG
C	OS	Phenanthrene	1600	UG/KG
C	OS	Pyrene	3700	UG/KG
C	OV	Carbon Disulfide	3	UG/KG
C	OV	Toluene	2	UG/KG
C	PESTP	4,4'-DDD	9.4	UG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
C	PESTP	4,4'-DDE	42	UG/KG
C	PESTP	4,4'-DDT	12	UG/KG
C	PESTP	Aldrin	0.74	UG/KG
C	PESTP	alpha-BHC	0.35	UG/KG
C	PESTP	alpha-Chlordane	58	UG/KG
C	PESTP	Aroclor-1242	7400	UG/KG
C	PESTP	Aroclor-1248	330	UG/KG
C	PESTP	Aroclor-1254	72	UG/KG
C	PESTP	Aroclor-1262	2000	UG/KG
C	PESTP	Aroclor-1268	1600	UG/KG
C	PESTP	delta-BHC	4.2	UG/KG
C	PESTP	Dieldrin	4.2	UG/KG
C	PESTP	Endosulfan I	3.6	UG/KG
C	PESTP	Endosulfan II	0.53	UG/KG
C	PESTP	Endosulfan Sulfate	4.5	UG/KG
C	PESTP	Endrin	6.4	UG/KG
C	PESTP	Endrin Aldehyde	18	UG/KG
C	PESTP	Endrin Ketone	9.2	UG/KG
C	PESTP	gamma-BHC	2.3	UG/KG
C	PESTP	gamma-Chlordane	9.7	UG/KG
C	PESTP	Heptachlor Epoxide	11	UG/KG
C	PESTP	Methoxychlor	1200	UG/KG
C	TOC	Total Organic Carbon	51800	MG/KG
D	ASB	Chrysotile	25	%
D	DIOXI	1,2,3,4,6,7,8-HpCDD	2.88	UG/KG
D	DIOXI	1,2,3,4,6,7,8-HpCDF	5.484	UG/KG
D	DIOXI	1,2,3,4,7,8,9-HpCDF	0.291	UG/KG
D	DIOXI	1,2,3,4,7,8-HxCDD	0.0443	UG/KG
D	DIOXI	1,2,3,4,7,8-HxCDF	5.947	UG/KG
D	DIOXI	1,2,3,6,7,8-HxCDD	0.27	UG/KG
D	DIOXI	1,2,3,6,7,8-HxCDF	3.632	UG/KG
D	DIOXI	1,2,3,7,8,9-HxCDD	0.311	UG/KG
D	DIOXI	1,2,3,7,8,9-HxCDF	0.0297	UG/KG
D	DIOXI	1,2,3,7,8-PeCDD	0.074	UG/KG
D	DIOXI	1,2,3,7,8-PeCDF	6.159	UG/KG
D	DIOXI	2,3,4,6,7,8-HxCDF	4.209	UG/KG
D	DIOXI	2,3,4,7,8-PeCDF	9.995	UG/KG
D	DIOXI	2,3,7,8-TCDD	0.0133	UG/KG
D	DIOXI	2,3,7,8-TCDF	9.145	UG/KG
D	DIOXI	OCDD	11.478	UG/KG
D	DIOXI	OCDF	5.106	UG/KG
D	DIOXI	Total HpCDD	5.115	UG/KG
D	DIOXI	Total HpCDF	7.609	UG/KG
D	DIOXI	Total HxCDD	2.133	UG/KG
D	DIOXI	Total HxCDF	24.015	UG/KG
D	DIOXI	Total PeCDD	0.287	UG/KG
D	DIOXI	Total PeCDF	13.666	UG/KG
D	DIOXI	Total TCDD	0.0133	UG/KG
D	DIOXI	Total TCDF	16.043	UG/KG
D	DIOXI	Toxicity Equivalency Factor	7.809	UG/KG
D	M	Aluminum	52500	MG/KG
D	M	Antimony	8060	MG/KG
D	M	Arsenic	192	MG/KG
D	M	Barium	19700	MG/KG
D	M	Beryllium	1.7	MG/KG
D	M	Cadmium	201	MG/KG
D	M	Calcium	134000	MG/KG
D	M	Chromium	1960	MG/KG
D	M	Cobalt	83.5	MG/KG
D	M	Copper	69600	MG/KG
D	M	Iron	216000	MG/KG
D	M	Lead	96400	MG/KG
D	M	Magnesium	77200	MG/KG
D	M	Manganese	3580	MG/KG
D	M	Mercury	5.7	MG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
D	M	Nickel	1420	MG/KG
D	M	Potassium	9440	MG/KG
D	M	Selenium	6.6	MG/KG
D	M	Silver	33.3	MG/KG
D	M	Sodium	24000	MG/KG
D	M	Thallium	3.5	MG/KG
D	M	Vanadium	86.2	MG/KG
D	M	Zinc	8650	MG/KG
D	MS	Aluminum	52800	UG/L
D	MS	Antimony	12.4	UG/L
D	MS	Arsenic	33.5	UG/L
D	MS	Barium	2800	UG/L
D	MS	Beryllium	4.4	UG/L
D	MS	Cadmium	14.1	UG/L
D	MS	Calcium	233000	UG/L
D	MS	Chromium	157	UG/L
D	MS	Cobalt	57.1	UG/L
D	MS	Copper	25000	UG/L
D	MS	Iron	49700	UG/L
D	MS	Lead	16100	UG/L
D	MS	Magnesium	40300	UG/L
D	MS	Manganese	3930	UG/L
D	MS	Nickel	163	UG/L
D	MS	Potassium	12300	UG/L
D	MS	Selenium	12.1	UG/L
D	MS	Sodium	37300	UG/L
D	MS	Vanadium	156	UG/L
D	MS	Zinc	3880	UG/L
D	MX	Copper	47000	MG/KG
D	MX	Lead	32000	MG/KG
D	OS	2,4-Dimethylphenol	1600	UG/KG
D	OS	2-Methylnaphthalene	2300	UG/KG
D	OS	2-Methylphenol	540	UG/KG
D	OS	4-Chloroaniline	140	UG/KG
D	OS	4-Methylphenol	730	UG/KG
D	OS	4-Nitroaniline	2500	UG/KG
D	OS	Acenaphthene	2000	UG/KG
D	OS	Acenaphthylene	5100	UG/KG
D	OS	Anthracene	5400	UG/KG
D	OS	Benzo(a)anthracene	23000	UG/KG
D	OS	Benzo(a)pyrene	21000	UG/KG
D	OS	Benzo(b)fluoranthene	18000	UG/KG
D	OS	Benzo(g,h,i)Perylene	7900	UG/KG
D	OS	Benzo(k)fluoranthene	17000	UG/KG
D	OS	bis(2-Ethylhexyl)phthalate	1800	UG/KG
D	OS	Carbazole	2100	UG/KG
D	OS	Chrysene	26000	UG/KG
D	OS	Di-n-Butylphthalate	1200	UG/KG
D	OS	Dibenzo(a,h)Anthracene	2300	UG/KG
D	OS	Dibenzofuran	1800	UG/KG
D	OS	Diethylphthalate	18000	UG/KG
D	OS	Dimethylphthalate	89	UG/KG
D	OS	Fluoranthene	76000	UG/KG
D	OS	Fluorene	5200	UG/KG
D	OS	Indeno(1,2,3-cd)pyrene	7700	UG/KG
D	OS	N-Nitroso-diphenylamine	260	UG/KG
D	OS	Naphthalene	1600	UG/KG
D	OS	Phenanthrene	41000	UG/KG
D	OS	Phenol	1800	UG/KG
D	OS	Pyrene	74000	UG/KG
D	OV	2-Butanone	33	UG/KG
D	OV	Acetone	100	UG/KG
D	OV	Carbon Disulfide	29	UG/KG
D	OV	Methylene Chloride	5	UG/KG
D	OV	Toluene	5	UG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB_RESULT	UNITS
D	OV	Trichloroethene	4	UG/KG
D	PCBC	2',3,4,4',5-Pentachlorobiphenyl (123)	75600	NG/KG
D	PCBC	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	282000	NG/KG
D	PCBC	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	24900	NG/KG
D	PCBC	2,3',4,4',5-Pentachlorobiphenyl (118)	18200	NG/KG
D	PCBC	2,3,3',4,4',5'-Hexachlorobiphenyl (157)	72900	NG/KG
D	PCBC	2,3,3',4,4',5-Hexachlorobiphenyl (156)	55800	NG/KG
D	PCBC	2,3,4,4',5-Pentachlorobiphenyl (114)	87400	NG/KG
D	PCBC	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	323	NG/KG
D	PCBC	3,3',4,4',5-Pentachlorobiphenyl (126)	1550	NG/KG
D	PCBC	3,3',4,4'-Tetrachlorobiphenyl (77)	25000	NG/KG
D	PCBC	Decachlorobiphenyl	35100	NG/KG
D	PCBC	Total Dichlorobiphenyls	13100	NG/KG
D	PCBC	Total Heptachlorobiphenyls	888000	NG/KG
D	PCBC	Total Hexachlorobiphenyls	508000	NG/KG
D	PCBC	Total Monochlorobiphenyls	3760	NG/KG
D	PCBC	Total Nonachlorobiphenyls	43100	NG/KG
D	PCBC	Total Octachlorobiphenyls	594000	NG/KG
D	PCBC	Total Pentachlorobiphenyls	266000	NG/KG
D	PCBC	Total Tetrachlorobiphenyls	187000	NG/KG
D	PCBC	Total Trichlorobiphenyls	339000	NG/KG
D	PESTP	4,4'-DDD	270	UG/KG
D	PESTP	4,4'-DDE	260	UG/KG
D	PESTP	4,4'-DDT	17	UG/KG
D	PESTP	Aldrin	480	UG/KG
D	PESTP	alpha-BHC	1.4	UG/KG
D	PESTP	alpha-Chlordane	950	UG/KG
D	PESTP	Aroclor-1016	3300	UG/KG
D	PESTP	Aroclor-1248	2600	UG/KG
D	PESTP	Aroclor-1254	120000	UG/KG
D	PESTP	Aroclor-1260	25000	UG/KG
D	PESTP	Aroclor-1262	25000	UG/KG
D	PESTP	Aroclor-1268	39000	UG/KG
D	PESTP	beta-BHC	6.9	UG/KG
D	PESTP	delta-BHC	2.8	UG/KG
D	PESTP	Dieldrin	8.8	UG/KG
D	PESTP	Endosulfan I	33	UG/KG
D	PESTP	Endosulfan II	570	UG/KG
D	PESTP	Endosulfan Sulfate	24	UG/KG
D	PESTP	Endrin	190	UG/KG
D	PESTP	Endrin Aldehyde	830	UG/KG
D	PESTP	Endrin Ketone	32	UG/KG
D	PESTP	gamma-BHC	91	UG/KG
D	PESTP	gamma-Chlordane	240	UG/KG
D	PESTP	Heptachlor	430	UG/KG
D	PESTP	Heptachlor Epoxide	730	UG/KG
D	PESTP	Methoxychlor	35	UG/KG
D	TOC	Total Organic Carbon	850000	MG/KG
E	DIOXI	1,2,3,4,6,7,8-HpCDD	0.0398	UG/KG
E	DIOXI	1,2,3,4,6,7,8-HpCDF	0.0111	UG/KG
E	DIOXI	1,2,3,4,7,8,9-HpCDF	0.000131	UG/KG
E	DIOXI	1,2,3,4,7,8-HxCDD	0.000717	UG/KG
E	DIOXI	1,2,3,4,7,8-HxCDF	0.000634	UG/KG
E	DIOXI	1,2,3,6,7,8-HxCDD	0.00141	UG/KG
E	DIOXI	1,2,3,6,7,8-HxCDF	0.000373	UG/KG
E	DIOXI	1,2,3,7,8,9-HxCDD	0.00214	UG/KG
E	DIOXI	1,2,3,7,8,9-HxCDF	0.000048	UG/KG
E	DIOXI	1,2,3,7,8-PeCDD	0.000612	UG/KG
E	DIOXI	1,2,3,7,8-PeCDF	0.000838	UG/KG
E	DIOXI	2,3,4,6,7,8-HxCDF	0.000322	UG/KG
E	DIOXI	2,3,4,7,8-PeCDF	0.000323	UG/KG
E	DIOXI	2,3,7,8-TCDD	0.000199	UG/KG
E	DIOXI	2,3,7,8-TCDF	0.000779	UG/KG
E	DIOXI	OCDD	0.925	UG/KG
E	DIOXI	OCDF	0.0404	UG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB RESULT	UNITS
E	DIOXI	Total HpCDD	0.117	UG/KG
E	DIOXI	Total HpCDF	0.0211	UG/KG
E	DIOXI	Total HxCDD	0.0327	UG/KG
E	DIOXI	Total HxCDF	0.00441	UG/KG
E	DIOXI	Total PeCDD	0.00834	UG/KG
E	DIOXI	Total PeCDF	0.0194	UG/KG
E	DIOXI	Total TCDD	0.00119	UG/KG
E	DIOXI	Total TCDF	0.00265	UG/KG
E	DIOXI	Toxicity Equivalency Factor	0.00245	UG/KG
E	M	Aluminum	29600	MG/KG
E	M	Antimony	3.1	MG/KG
E	M	Arsenic	20.9	MG/KG
E	M	Barium	232	MG/KG
E	M	Beryllium	1.2	MG/KG
E	M	Calcium	4740	MG/KG
E	M	Chromium	125	MG/KG
E	M	Cobalt	14.4	MG/KG
E	M	Copper	269	MG/KG
E	M	Iron	38200	MG/KG
E	M	Lead	212	MG/KG
E	M	Magnesium	10900	MG/KG
E	M	Manganese	367	MG/KG
E	M	Mercury	0.89	MG/KG
E	M	Nickel	34.6	MG/KG
E	M	Potassium	3880	MG/KG
E	M	Silver	2.2	MG/KG
E	M	Sodium	4410	MG/KG
E	M	Thallium	3.5	MG/KG
E	M	Vanadium	102	MG/KG
E	M	Zinc	157	MG/KG
E	OS	4-Methylphenol	68	UG/KG
E	OS	Acenaphthylene	69	UG/KG
E	OS	Benzo(a)anthracene	260	UG/KG
E	OS	Benzo(a)pyrene	400	UG/KG
E	OS	Benzo(b)fluoranthene	970	UG/KG
E	OS	Benzo(g,h,i)Perylene	170	UG/KG
E	OS	Benzo(k)fluoranthene	930	UG/KG
E	OS	Carbazole	34	UG/KG
E	OS	Chrysene	450	UG/KG
E	OS	Dibenzo(a,h)Anthracene	54	UG/KG
E	OS	Fluoranthene	500	UG/KG
E	OS	Indeno(1,2,3-cd)pyrene	180	UG/KG
E	OS	Phenanthrene	200	UG/KG
E	OS	Phenol	170	UG/KG
E	OS	Pyrene	650	UG/KG
E	PCBC	2',3,4,4',5-Pentachlorobiphenyl (123)	46000	NG/KG
E	PCBC	2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	23600	NG/KG
E	PCBC	2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	11900	NG/KG
E	PCBC	2,3',4,4',5,5'-Hexachlorobiphenyl (167)	2860	NG/KG
E	PCBC	2,3',4,4',5-Pentachlorobiphenyl (118)	4840	NG/KG
E	PCBC	2,3,3',4,4',5'-Hexachlorobiphenyl (157)	11500	NG/KG
E	PCBC	2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	618	NG/KG
E	PCBC	2,3,3',4,4',5-Hexachlorobiphenyl (156)	4620	NG/KG
E	PCBC	2,3,4,4',5-Pentachlorobiphenyl (114)	98200	NG/KG
E	PCBC	3,3',4,4',5,5'-Hexachlorobiphenyl (169)	14	NG/KG
E	PCBC	3,3',4,4',5-Pentachlorobiphenyl (126)	179	NG/KG
E	PCBC	3,3',4,4'-Tetrachlorobiphenyl (77)	2810	NG/KG
E	PCBC	Decachlorobiphenyl	2000	NG/KG
E	PCBC	Total Dichlorobiphenyls	11000	NG/KG
E	PCBC	Total Heptachlorobiphenyls	48200	NG/KG
E	PCBC	Total Hexachlorobiphenyls	223000	NG/KG
E	PCBC	Total Monochlorobiphenyls	308	NG/KG
E	PCBC	Total Nonachlorobiphenyls	9870	NG/KG
E	PCBC	Total Octachlorobiphenyls	29800	NG/KG
E	PCBC	Total Pentachlorobiphenyls	449000	NG/KG

AOC	FRACTION	PARAMETER	MaxOfLAB_RESULT	UNITS
E	PCBC	Total Tetrachlorobiphenyls	156000	NG/KG
E	PCBC	Total Trichlorobiphenyls	47900	NG/KG
E	PESTP	4,4'-DDD	9.2	UG/KG
E	PESTP	4,4'-DDE	280	UG/KG
E	PESTP	Aldrin	21	UG/KG
E	PESTP	alpha-BHC	0.19	UG/KG
E	PESTP	alpha-Chlordane	360	UG/KG
E	PESTP	Aroclor-1242	30000	UG/KG
E	PESTP	Aroclor-1254	40000	UG/KG
E	PESTP	beta-BHC	24	UG/KG
E	PESTP	Dieldrin	230	UG/KG
E	PESTP	Endosulfan I	31	UG/KG
E	PESTP	Endosulfan II	74	UG/KG
E	PESTP	Endosulfan Sulfate	22	UG/KG
E	PESTP	Endrin	17	UG/KG
E	PESTP	Endrin Aldehyde	380	UG/KG
E	PESTP	gamma-BHC	4.9	UG/KG
E	PESTP	gamma-Chlordane	76	UG/KG
E	PESTP	Heptachlor	8	UG/KG
E	PESTP	Heptachlor Epoxide	49	UG/KG
E	TOC	Total Organic Carbon	73600	MG/KG

Representative VOC Concentrations (ug/kg)
Detected in Soil at Raymark OU2

Location	EPA Sample No.	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Chlorobenzene	Ethylbenzene	m&p-Xylene	o-Xylene	t-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total VOCs
OU2-DUP02	DAH738	5.9	ND	ND	ND	ND	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.4
OU2-SB-207-4850	DAH733	110	24	18	ND	ND	48	ND	ND	ND	ND	ND	ND	ND	ND	ND	200
OU2-SB-207-5052	DAH737	36	ND	5.4	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	55.4
OU2-SB-207-6062	DAH734	8.9	1.4	ND	ND	ND	4.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.4
OU2-SB-207-7375	DAH735	2.2	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2
OU2-SB-207-8385	DAH736	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2
OU2-SB-209-2830	DAH727	1.5	5.1	1.1	ND	ND	0.48	5.3	0.72	1.5	1.1	ND	ND	ND	2.5	ND	16.8
OU2-SB-209-3840	DAH728	ND	0.57	ND	ND	ND	ND	0.9	ND	0.72	ND	ND	ND	ND	ND	ND	2.19
OU2-SB-209-4850	DAH729	0.61	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	0.63	ND	1.91
OU2-SB-209-5860	DAH730	20	ND	ND	ND	ND	ND	0.54	ND	0.58	ND	ND	ND	ND	15	ND	21.12

Representative VOC Concentrations (ug/L)
Detected in Groundwater at Raymark OU2

Profiling Location	Sampling Depth (ft bgs)	Sample Elevation (ft NGVD)	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Chlorobenzene	Ethylbenzene	m&p-Xylene	o-Xylene	t-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total VOCs
DP1-1	13		140	62	110	ND	ND	80	13	ND	ND	ND	ND	ND	ND	ND	17	422
DP1-1	23		370	130	190	ND	21	170	28	ND	ND	ND	ND	ND	ND	ND	22	931
DP1-1	33		740	120	260	ND	ND	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	1300
DP1-1	44		180	52	70	ND	ND	54	16	ND	ND	ND	ND	ND	ND	ND	ND	372
DP1-1	55		5.5	4.8	3	ND	ND	2.8	5.2	ND	1.4	ND	ND	1.7	1.6	2	ND	28
DP1-1	68		5.2	6.7	2.6	ND	ND	2	1.8	ND	ND	ND	ND	ND	ND	1.9	ND	20.2
DP1-2	9		200	75	150	ND	ND	110	16	ND	ND	ND	ND	ND	ND	10	15	576
DP1-2	20		100	74	140	ND	ND	96	15	ND	ND	ND	ND	ND	ND	11	16	452
DP1-2	30		180	80	140	ND	ND	100	15	ND	ND	ND	ND	ND	ND	ND	ND	515
DP1-3	10.5		46	140	160	ND	ND	160	ND	ND	ND	ND	ND	ND	ND	36	11	553
DP1-3	18.5		65	150	210	ND	ND	170	ND	ND	ND	ND	ND	ND	ND	29	19	643
DP1-6	11.5		ND	ND	ND	ND	ND	ND	ND	ND	3.3	ND	ND	ND	2.9	ND	ND	6.2
DP1-6	22.5		ND	1.1	ND	ND	1.9	3.3	ND	ND	2.9	ND	ND	ND	3	ND	ND	12.2
DP1-6A	27.5		ND	ND	ND	ND	1.8	ND	ND	ND	4	ND	ND	ND	1.5	ND	ND	7.3
DP1-7	8.5		ND	43	12	ND	ND	140	13	ND	ND	ND	ND	ND	ND	53	64	325
DP1-8	14.5		ND	94	ND	ND	ND	480	ND	ND	ND	ND	ND	ND	ND	57	120	751
DP1-8	25.5		ND	120	ND	ND	ND	410	75	ND	ND	ND	ND	ND	ND	84	120	809
DP1-9	15.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP1-9	25.5		ND	140	ND	ND	ND	240	130	ND	ND	ND	ND	ND	ND	ND	92.5	602.5
DP1-9A	35.5		ND	ND	ND	ND	ND	260	ND	ND	ND	ND	ND	ND	ND	2100	ND	2360
DP1-9A	45.5		ND	60	ND	ND	ND	100	110	ND	ND	ND	ND	ND	ND	ND	52	322
DP1-9A	55.5		ND	89	ND	ND	ND	160	120	ND	11.8	ND	ND	ND	ND	ND	77	457.8
DP1-11	24.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP1-11	36.5		ND	45	ND	ND	ND	35	ND	ND	ND	ND	ND	ND	ND	32	ND	112
DP1-11	47.5		25	81	16	ND	ND	66	51	ND	ND	ND	ND	ND	ND	ND	12	251
DP1-11	55.5		32	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	43
DP1-12	16.5		ND	ND	ND	ND	ND	1.6	8.3	ND	ND	ND	ND	ND	ND	ND	ND	9.9
DP1-12	26.5		ND	30	ND	ND	ND	23	100	ND	ND	ND	ND	ND	ND	ND	ND	153
DP1-12	32.5		ND	100	ND	ND	ND	28	120	ND	ND	ND	ND	ND	ND	28	ND	276
DP2-1	13.5		ND	18	3.8	ND	6.3	9.1	11	ND	2.6	ND	ND	2.9	ND	1.5	2.3	57.5
DP2-1	25.5		ND	ND	ND	2	1.3	13	14	ND	2.2	ND	ND	20	1.7	8.8	4.6	67.6
DP2-1	34.5		ND	ND	ND	2.8	4.5	7.1	18	ND	2.5	ND	ND	8.1	1.7	3.9	2.7	51.3
DP2-1	45.5		ND	4.8	1.3	ND	14	4.2	13	1.4	3	2.1	ND	ND	3	ND	1.2	48
DP2-1	56.5		ND	ND	ND	1.8	2.2	3.2	9.4	1.3	3	1.1	ND	4.9	2.2	8.8	1.2	39.1
DP2-1	66.5		ND	ND	ND	1.9	2.9	2.6	7.2	1.1	2.7	1.1	ND	3.5	2.3	18	1.2	44.5
DP2-1	76.5		ND	ND	ND	ND	1.2	1.1	1.3	ND	3.3	1.3	ND	ND	3	7.6	ND	18.8
DP2-2	13.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP2-2	24.5		ND	6.3	1.3	ND	8.1	3.5	12	ND	1.2	ND	ND	ND	ND	ND	1.5	33.9
DP2-2	34.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP2-2	45.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-1	8.5		ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	5.2	ND	6.7
DP3-1	18.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	1.1
DP3-1	28.5		ND	ND	ND	ND	ND	ND	3200	ND	ND	ND	ND	ND	ND	ND	ND	3200

Representative VOC Concentrations (ug/L)
Detected in Groundwater at Raymark OU2

Profiling Location	Sampling Depth (ft bgs)	Sample Elevation (ft NGVD)	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Chlorobenzene	Ethylbenzene	m&p-Xylene	o-Xylene	-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total VOCs
DP3-1	38.5		ND	ND	ND	ND	ND	ND	6800	ND	ND	ND	ND	ND	ND	ND	ND	6800
DP3-1	48.5		ND	ND	ND	ND	ND	ND	3600	ND	ND	ND	ND	ND	ND	ND	ND	3600
DP3-1	53.5		ND	ND	ND	ND	ND	ND	770	ND	ND	ND	ND	ND	ND	ND	ND	770
DP3-2	9.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-2	19.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-2	29.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-2	39.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-2	49.5		ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	ND	6.5
DP3-2	59.5		ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	1.1
DP3-3	9.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-3	19.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP3-3	29.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.5	ND	4.5
DP3-3	39.5		ND	ND	ND	17	ND	2.4	1.2	ND	ND	ND	ND	ND	ND	18	ND	38.6
DP3-3	49.5		ND	ND	ND	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	40
DP4-1	14.5		ND	ND	ND	ND	ND	ND	28	ND	ND	ND	ND	ND	ND	ND	ND	28
DP4-1	27.5		ND	ND	ND	ND	ND	ND	360	ND	ND	ND	ND	ND	ND	ND	ND	360
DP4-3A	14.5		ND	110	ND	ND	ND	350	ND	ND	ND	ND	ND	ND	ND	ND	ND	460
DP4-3A	20.5		ND	130	ND	ND	ND	420	ND	ND	ND	ND	ND	ND	ND	ND	180	730
DP4-4	7.5		2600	600	ND	ND	ND	650	ND	ND	ND	ND	ND	ND	ND	ND	ND	3850
DP4-4A	17.5		6700	ND	510	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	8310
DP4-4A	27.5		5700	ND	ND	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	6800
DP4-4A	36.5		4600	ND	ND	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	5700
DP4-4A	47.5		5000	ND	ND	ND	ND	1300	ND	ND	ND	ND	ND	ND	ND	ND		6300
DP4-5C	16.5		670	ND	130	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120	ND	920
DP4-5C	26.5		3300	250	820	ND	ND	400	ND	ND	ND	ND	ND	ND	ND	570	ND	5340
DP4-5C	36.5		4600	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	780	ND	6480
DP4-5C	46.5		7850	ND	2500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	ND	11750
DP4-5C	56.5		10000	ND	3900	ND	ND	1800	ND	ND	ND	ND	ND	ND	ND	5200	ND	20900
DP4-7	20.5		1200	100	390	ND	ND	170	ND	ND	ND	ND	ND	ND	ND	250	ND	2110
DP4-9	23.5		450	ND	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	570
DP5-1	16.5		ND	5.3	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	3.5	10.8
DP5-1	26.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP5-1	30.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP5-2	16.5		1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6
DP5-2	26.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP5-2	36.5		ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP5-2	56.5		ND	120	ND	ND	ND	720	ND	ND	ND	ND	ND	ND	ND	ND	ND	840
DP5-2	66.5		490	ND	99	ND	ND	130	ND	ND	ND	ND	ND	ND	ND	99	ND	818
DP5-2	76.5		3000	ND	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4300
DP5-2	86.5		2700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2700
DP5-2	96.5		3100	ND	ND	ND	ND	520	ND	ND	ND	ND	ND	ND	ND	ND	ND	3620
DP5-2	106.5		5800	ND	570	ND	ND	620	ND	ND	ND	ND	ND	ND	ND	ND	ND	6990
DP5-2	116.5		9300	ND	3300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1100	ND	13700

Representative VOC Concentrations (ug/L)
Detected in Groundwater at Raymark OU2

Profiling Location	Sampling Depth (ft bgs)	Sample Elevation (ft NGVD)	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Chlorobenzene	Ethylbenzene	m&p-Xylene	o-Xylene	t-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total VOCs
DP5-2	126.5		17000	ND	8100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	ND	26500
DP5-2	136.5		14000	ND	6200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	ND	21600
DP5-4	11.5		5000	3000	450	ND	3200	880	ND	ND	ND	ND	ND	ND	ND	ND	ND	12530
DP5-4	22.5		8700	1600	500	ND	ND	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	12000
DP5-4	32.5		6600	970	ND	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	8670
DP5-4	42.5		7400	1400	560	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	10460
DP5-5	17.5		41	13	5.9	ND	ND	8.4	ND	ND	ND	ND	ND	ND	ND	2.5	ND	70.8
DP5-5	27.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP5-5	36.5		3500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3500
DP5-5	47.5		2200	ND	ND	ND	ND	520	ND	ND	ND	ND	ND	ND	ND	ND	ND	2720
DP5-5	57.5		9200	ND	950	ND	ND	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	11450
DP5-5	68.5		10000	ND	1200	ND	ND	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	12500
DP5-5	77.5		9200	ND	890	ND	ND	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	11290
DP5-5	87.5		9400	ND	760	ND	ND	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	11360
DP5-6	17.5		ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1
DP5-6	27.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP5-6	35.5		ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	11
DP6-1	13.5		ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2
DP6-1	26.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-1	37.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-2B	6.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-2B	17.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-2B	27.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-3	10.5		3.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	4.1
DP6-3	22.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-3	32.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP6-3	40.5		1.6	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2
DP6-5A	18.5		17	16	9.8	ND	ND	5.9	ND	ND	ND	ND	ND	ND	ND	8.7	ND	57.4
DP6-5A	28.5		170	150	150	ND	ND	110	ND	ND	ND	ND	ND	ND	ND	44	ND	624
DP6-5A	41.5		230	180	190	ND	ND	140	ND	ND	ND	ND	ND	ND	ND	64	ND	804
DP6-6	16.5		230	73	72	ND	ND	140	ND	ND	ND	ND	ND	ND	ND	65	ND	580
DP6-6A	22.5		180	55	53	ND	ND	89	ND	ND	ND	ND	ND	ND	ND	ND	ND	377
DP6-6A	31.5		280	95	150	ND	ND	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	715
DP6-7B	19.5		1600	200	430	ND	ND	390	ND	ND	ND	ND	ND	ND	ND	240	ND	2860
DP6-7B	29.5		3400	ND	730	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	ND	4810
DP6-7B	39.5		3200	ND	860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4060
DP6-7B	46.5		5600	480	1800	ND	ND	730	ND	ND	ND	ND	ND	ND	ND	1200	ND	9810
DP6-8B	14.5		1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1300
DP6-8B	24.5		6000	ND	1600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7600
DP6-9	10.5		1200	380	580	ND	ND	560	ND	ND	ND	ND	ND	ND	ND	170	ND	2890
DP7-2A	8.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP7-4	9.5		ND	29	ND	ND	ND	35	31	ND	ND	ND	ND	ND	ND	ND	32	127
DP7-4	19.5		ND	16	ND	ND	ND	89.5	12.5	ND	ND	ND	ND	ND	ND	ND	22	140

Representative VOC Concentrations (ug/L)
Detected in Groundwater at Raymark OU2

Profiling Location	Sampling Depth (ft bgs)	Sample Elevation (ft NGVD)	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Chlorobenzene	Ethylbenzene	m&p-Xylene	o-Xylene	t-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total VOCs
DP7-4	29.5		ND	18	ND	ND	ND	91	11	ND	ND	ND	ND	ND	ND	ND	14	134
DP7-4	39.5		ND	ND	ND	ND	ND	130	ND	ND	ND	ND	ND	ND	ND	ND	ND	130
DP7-4	49.5		ND	120	ND	ND	ND	400	74	ND	ND	ND	ND	ND	ND	ND	95	689
DP7-4	59.5		ND	120	ND	ND	ND	1100	180	ND	ND	ND	ND	ND	ND	1700	340	3440
DP7-5	10.5		9200	ND	2700	ND	ND	1200	ND	ND	ND	ND	ND	ND	ND	1700	ND	14800
DP7-5A	20.5		9200	ND	2500	ND	ND	1000	ND	ND	ND	ND	ND	ND	ND	1600	ND	14300
DP7-5A	30.5		7800	ND	2500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10300
DP7-5A	40.5		9800	ND	4600	ND	ND	1500	ND	ND	ND	ND	ND	ND	ND	ND	ND	15900
DP7-9A	24.5		40	ND	13	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	10	ND	68
DP7-9A	36.5		2300	210	890	ND	ND	360	ND	ND	ND	ND	ND	ND	ND	540	ND	4300
DP8-1A	11.5		ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3
DP8-1A	21.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	3.7	ND	19.7
DP8-1A	31.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57	ND	5.5	ND	62.5
DP8-1A	41.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.2	ND	ND	ND	8.2
DP8-1A	51.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	ND	ND	ND	5.9
DP8-1A	61.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	1.3	ND	19.3
DP8-1A	71.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38.5	ND	38.5
DP8-1A	80.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP8-3A	11.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP8-5	11.5		ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	1.2	ND	ND	2.3
DP8-5	22.5		110	150	140	ND	ND	200	ND	ND	ND	ND	ND	ND	ND	110	ND	710
DP8-5	32.5		67	140	150	ND	ND	200	ND	ND	ND	ND	ND	ND	ND	85	ND	642
DP8-5	42.5		2200	250	800	ND	ND	600	ND	ND	ND	ND	ND	ND	ND	1000	ND	4850
DP8-5	52.5		2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	ND	3600
DP8-5	62.5		2600	ND	ND	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND	2000	ND	5700
DP8-5	75.5		1700	ND	ND	ND	ND	1550	ND	ND	ND	ND	ND	ND	ND	1900	ND	5150
DP8-5	84.5		300	68	160	ND	ND	420	60	ND	ND	ND	ND	ND	ND	760	ND	1768
DP8-6	13.5		79	ND	38	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	30	ND	161
DP8-6	24.5		620	ND	850	ND	ND	830	ND	ND	ND	ND	ND	ND	ND	3000	ND	5300
DP8-6	34.5		ND	ND	ND	ND	ND	850	ND	ND	ND	ND	ND	ND	ND	3000	ND	3850
DP9-1	10.5		ND	ND	ND	ND	ND	ND	ND	670	1000	ND	ND	ND	ND	ND	ND	1670
DP9-1	20.5		ND	ND	ND	ND	ND	ND	1	4.4	6.1	ND	ND	ND	ND	ND	ND	11.5
DP9-1	30.5		ND	ND	ND	ND	ND	ND	ND	1.3	1.7	ND	ND	ND	ND	ND	ND	3
DP9-1	40.5		ND	ND	ND	ND	ND	1.9	1.2	ND	ND	ND	ND	4.1	ND	2.4	ND	9.6
DP10-3	10.5		ND	ND	ND	ND	440	ND	ND	930	2500	150	ND	ND	ND	ND	ND	4020
DP10-3A	20.5		ND	ND	ND	ND	ND	ND	ND	3.6	3.2	ND	ND	ND	ND	ND	ND	6.8
DP10-4	7.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP10-4	17.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DP10-5	16.5		90	77	47	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	10	ND	244
DP10-5	26.5		8.5	8.7	3.7	ND	ND	2.4	ND	ND	ND	ND	ND	ND	ND	1.3	ND	24.6
DP13-1	17.5		2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	1.7	ND	5.6
DP13-1	27.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1200	ND	1200
DP13-1	38.5		650	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1300	ND	1950

Representative VOC Concentrations (ug/L)
Detected in Groundwater at Raymark OU2

Profiling Location	Sampling Depth (ft bgs)	Sample Elevation (ft NGVD)	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Chlorobenzene	Ethylbenzene	m&p-Xylene	-Xylene	-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total VOCs
DP13-1	47.5		470	220	240	ND	ND	310	ND	ND	ND	ND	ND	ND	ND	800	ND	2040
DP13-3	15.5		1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5	ND	8.2
DP13-3	25.5		2.5	2.2	1.4	ND	ND	3.2	ND	ND	ND	ND	ND	ND	ND	10	ND	19.3
DP13-3	34.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.6	ND	9.6
DP5A-1	7.5		ND	1900	ND	ND	ND	340	ND	ND	ND	ND	ND	ND	ND	ND	ND	2240
DP5A-1	17.5		780	660	280	ND	220	520	ND	ND	ND	ND	ND	ND	ND	ND	ND	2460
DP5A-1	28.5		3400	310	370	ND	ND	590	ND	ND	ND	ND	ND	ND	ND	ND	ND	4670
DP5A-1	37.5		3100	270	420	ND	ND	510	ND	ND	ND	ND	ND	ND	ND	ND	ND	4300
DP5A-2	7.5		ND	ND	ND	ND	9600	ND	ND	ND	ND	ND	ND	ND	5800	ND	ND	15400
DP5A-2	17.5		ND	ND	ND	ND	3400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3400
DP5A-2	22.5		ND	ND	ND	ND	4300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4300
DP5A-2A	27.5		ND	ND	ND	ND	1500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1500
DP5A-3A	16.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120	120
DP5A-3A	27.5		16	68	ND	ND	68	29	43	ND	ND	ND	ND	ND	ND	ND	50	274
DP5A-3A	36.5		ND	ND	ND	ND	ND	400	100	ND	ND	ND	ND	ND	ND	ND	270	770
DP5A-3A	47.5		ND	ND	ND	ND	ND	740	ND	ND	ND	ND	ND	ND	ND	890	250	1880
DP5A-4A	11.5		ND	ND	ND	ND	ND	700	ND	ND	ND	ND	ND	ND	ND	ND	ND	700
FCP1	13		ND	400	170	ND	ND	580	ND	ND	ND	ND	ND	ND	ND	ND	ND	1150
FCP2	12		ND	54.5	ND	ND	ND	190	ND	ND	ND	ND	ND	ND	ND	ND	105	349.5
FCP3	13		51	12	24	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	20	ND	121
DPA1-2	12.5		ND	ND	ND	ND	ND	ND	ND	ND	12000	ND	ND	ND	94000	ND	ND	106000
DPA1-2	17.5		ND	ND	ND	ND	ND	ND	880	ND	4500	ND	ND	ND	6400	ND	ND	11780
DPA1-5	11.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	54000	ND	ND	54000
DPA1-5	21.5		ND	ND	ND	ND	ND	ND	ND	1300	4800	ND	ND	ND	3000	ND	ND	9100
DPA3-2	12.5		ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	1.1
DPA3-2	22.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	1.1
DPA3-2	33.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.1
DPA3-5	9.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

APPENDIX B
BID FORM/UNIT PRICE SCHEDULE

PRICE PROPOSAL FORM
IDW DISPOSAL
RAYMARK OPERABLE UNITS NO. 2 AND NO. 4
STRATFORD, CONNECTICUT

Item	Description	Estimated Quantity	Unit	Unit Price	Total Amount
1	MOBILIZATION/DEMOBILIZATION	1	L.S.		
2	CONSOLIDATION	1	L.S.		
3	WASTE CHARACTERIZATION	1	L.S.		
4	FRAC TANK DECONTAMINATION	1	L.S.		
5	LIQUID IDW (LOAD, TRANSPORT, AND DISCHARGE)	26540	GALLON		
6	SOLID IDW (LOAD, TRANSPORT, AND DISCHARGE) *				
6A	Transportation	20	TON		
6B	Disposal	20	TON		
7	EMPTY DRUM DISPOSAL	60	DRUM		
				TOTAL	

* Based on some assumption of type of waste.

Authorized Signature: ______________________ Date: ______________

Print Name: ______________________

Print Position: ______________________

Print Company Name: ______________________

APPENDIX C

DATA QUALITY OBJECTIVES FORMS

EPA-NE - DQO SUMMARY FORM

Page 1 of ____

A separate Form should be completed for each sampling event. Refer to Attachment A for instructions on completing this form, Attachment B for a complete list of the parameter codes and Attachment C for an example of a completed form.

1. EPA Program: TSCA [✓ CERCLA] RCRA DW NPDES CAA
Other: ____
Projected Date(s) of Sampling 3-1-99 TO 3-4-99
EPA Site Manager RONALD JENNINGS
EPA Case Team Members ____

Site Name RAYMARK
Site Location STRATFORD, CT
Assigned Site Latitude/Longitude ____
CERCLA Site/Spill Identifier No. 01 SHORE ROAD (Include Operable Unit)
Phase: ERA SA/SI pre-RI RI (phase I, etc.) FS RD RA post-RA
(circle one) Other: EE\CA

2. QAPjP Title and Revision Date SAP RAYMARK SHORE ROAD EE\CA ; February 1999
Approved by: ____ Date of Approval: ____
Title of Approving Official: ____ Organization*: EPA
*If other than EPA, record date approval authority was delegated: ____

EPA Oversight Project (circle one) Y N
Confirmatory Analysis for Field Screening Y N
Are comparability criteria documented? Y N
Type of EPA Oversight (circle one) PRP or FF Other: ____
If EPA Oversight or Confirmatory: % splits ____

3.	a.	Matrix Code[1]	SO	SO	SO	SO				
	b.	Parameter Code[2]	XRF SCRN	PCB SCRN	1613B	ASBESTOS PLM				
	c.	Preservation Code[3]	5	5	5	—				
	d.	Analytical Services Mechanism	DAS	DAS	DAS	DAS				
	e.	No. of Sample Locations	300	300	25	300				
		Field QC:								
	f.	Field Duplicate Pairs	15	15	3	15				
	g.	Equipment Blanks	—	—	—	—				
	h.	VOA Trip Blanks	—	—	—	—				
	i.	Cooler Temperature Blanks	30	30	3	30				
	j.	Bottle Blanks	—	—	—	—				
	k.	Other: ____								
	l.	PES sent to Laboratory	6	6	4	—				
		Laboratory QC:								
	m.	Reagent Blank	✓	✓	✓					
	n.	Duplicate	✓		✓					
	o.	Matrix Spike		✓	✓					
	p.	Matrix Spike Duplicate		✓	✓					
	q.	Other: ____								

4. Site Information
Site Dimensions ____
List all potentially contaminated matrices SO
Range of Depth to Groundwater ____
Soil Types: Surface [✓ Subsurface] Other: ____
Sediment Types: Stream Pond Estuary Wetland Other: ____ Expected Soil/Sediment Moisture Content: High Low

When multiple matrices will be sampled during a sampling event, complete Sections 5-10 for each matrix. Matrix Code[1] SO

5. Data Use (circle all that apply)
Site Investigation/Assessment
[✓ Nature and Extent of Contamination]
Engineering Design
Post-Remedial Action (quarterly monitoring)
PRP Determination
[✓ Human and/or Ecological Risk Assessment]
Remedial Action
Removal Actions
[✓ Remediation Alternatives]
Other: ____

6. Summarize DQOs: SUPPORT DELINEATION OF CURRENT EXTENT PCB, LEAD, ASBESTOS AND DIOXINS IN SHORE ROAD AREA FOR EE\CA REPORT.

Complete Table if applicable

COCs	Action Levels	Analytical Method-Quantitation Limits

7. Sampling Method (circle technique) Bailer Low flow pump (Region I method: Yes No) Peristaltic Pump Positive Displacement Pump Faucet or Spigot Other: [✓ Split Spoon] Dredge Trowel Other:

Sampling Procedures (SOP name. No., Rev. #. and date) SAP RAYMARK SHORE ROAD EE\CA
List Background Sample Locations
Circle: Grab or Composite
"Hot spots" sampled: Yes No

8. Field Data (circle) ORP pH Specific Conductance Dissolved O_2 Temperature Turbidity
Other:

9. Analytical Methods and Parameters

Method title/SOP name	Method/SOP Identification number	Revision Date	Target Parameters (VOA. SV. Pest/PCB. Metals. etc.)
XRF / SCRN FOR LEAD	EPA REGION I	REV 0.0\10-29-96	LEAD
PCB\GC\ECD SCRN	EPA\ERT\REGC	REV 1.0\6-25-93	PCB
ASBESTOS PLM SCRN	EPA REGION I	1994	ASBESTOS

10. Validation Criteria (circle one) [✓ 1.] Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, III or IV
2. Other Approved Validation Criteria:
Validation Tier (circle one) I [✓ II] III Partial Tier III:
Company/Organization Performing Data Validation TETRA TECH, NUS [✓ Prime] or Subcontractor (circle one)

11. Company Name TETRA TECH, NUS
Contract Number 68-W6-0045
Contract Name (e.g. START, RACS, etc.) RAC
Work Assignment No. 035-NSEE-01H3
Person Completing Form/Title BILL IRWIN
Date of DQO Summary Form Completion 2-23-99

Matrix Codes[1] - Refer to Attachment B, Part I
Parameter Codes[2] - Refer to Attachment B, Part II

Preservation Codes[3]

1.	HCl to pH ≤ 2	7.	$K_2Cr_2O_7$
2.	HNO_3	8.	Freeze
3.	$NaHSO_4$	9.	Room Temperature (avoid excessive heat)
4.	H_2SO_4	10.	Other (Specify)
5.	Cool @ 4°C (± 2°)	N.	Not preserved
6.	NaOH		

* - To supplement Matrix Codes and/or Parameter Codes contact the QA Unit