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U.S. Army Corps of Engineers

New England District
Concord, Massachusetts

Soil and Sediment Remediation
Open Burning Grounds
Seneca Army Depot Activity
Romulus, New York

Contract No. DACW33-95-D-0004

REVISED DRAFT

PROJECT SAMPLING AND ANALYSIS PLAN

Delivery Order No. 0013

DCN: SEDA-042399-AACN

April 1999

98P-0892

WESTON®
MANAGERS DESIGNERS/CONSULTANTS

PROJECT FIELD SAMPLING PLAN
SOIL AND SEDIMENT REMEDIATION
OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

REVISED DRAFT

Contract No. DACW33-95-D-0004
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DCN: SEDA-042399-AACN

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
NORTH ATLANTIC DIVISION
NEW ENGLAND DISTRICT
696 Virginia Road
Concord, Massachusetts 01742-2751

Prepared by:

ROY F. WESTON, INC.
One Wall Street
Manchester, New Hampshire 03101-1501

April 1999

W.O. No. 03886-118-013-0160-01

PROJECT SAMPLING AND ANALYSIS PLAN
SOIL AND SEDIMENT REMEDIATION
OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

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April 1999

COMMITMENT TO IMPLEMENT THE ABOVE
FIELD SAMPLING PLAN

[illegible]
Project/Task Manager (print)

4/22/99
Signature Date

John Hagopian
Contractor's QC Manager (print)

John Hagopian 4/22/99
Signature Date

Other as Appropriate/Affiliation* (print)

Signature Date

*Commitment signature is required for any ancillary sampling, analytical, or data gathering support provided by a contractor or subcontractor. For example, the Contractor's laboratory QA manager or director should sign the title page if analytical services are provided.

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LIST OF ACRONYMS

BNAs	Base/Neutral/Acids
BRAC	Base Realignment and Closure
CCQC	Contractor Chemical Quality Control
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CO_2	carbon dioxide
DCQCRs	Daily Chemical Quality Control Reports
DDE	1,1-Dichloro-2,2-Bis(P- Chlorophenyl)Ethene
DDT	Dichlorodiphenyl Trichloroethane
DOD	Department of Defense
ft^2	Square Feet
GT	Greater Than
HCl	Hydrochloric Acid
HEPA	High-Efficiency Particulate Air
IDWs	Investigation-Derived Wastes
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NPL	National Priority List
OB	Open Burning
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
PSMs	Program Safety Managers
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAP	Remedial Action Plan
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan

LIST OF ACRONYMS
(CONTINUED)

SM	Site Manager
SOW	Scope Of Work
SSHASP	Site-Specific Health and Safety Plan
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOCs	Semivolatile Organic Compounds
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds
WBS	Work Breakdown Structure
XRF	X-ray Fluorescence

SECTION 1

PROJECT DESCRIPTION

1. PROJECT DESCRIPTION

During a Remedial Investigation/Feasibility Study (RI/FS) of the Open Burning (OB) Grounds site (SEAD-23) at the Seneca Army Depot Activity (SEDA), lead contaminated soil was identified within the OB Grounds at nine of the pits formerly used to burn ordnance. In addition, lead and copper contaminated sediment was identified in a brook adjacent to the OB Grounds. Concurrent with excavating and screening activities for unexploded ordinance (UXO), the contaminated soils and sediments will be removed, tested, treated, and disposed of as necessary. Throughout the excavation activities, it will be necessary to dewater the excavation area, treat, and test the water prior to discharge. In addition, the 30-acre OB Grounds area will be covered with clean fill upon completion of remediation activities, as necessary based on total lead concentrations in the surface soils.

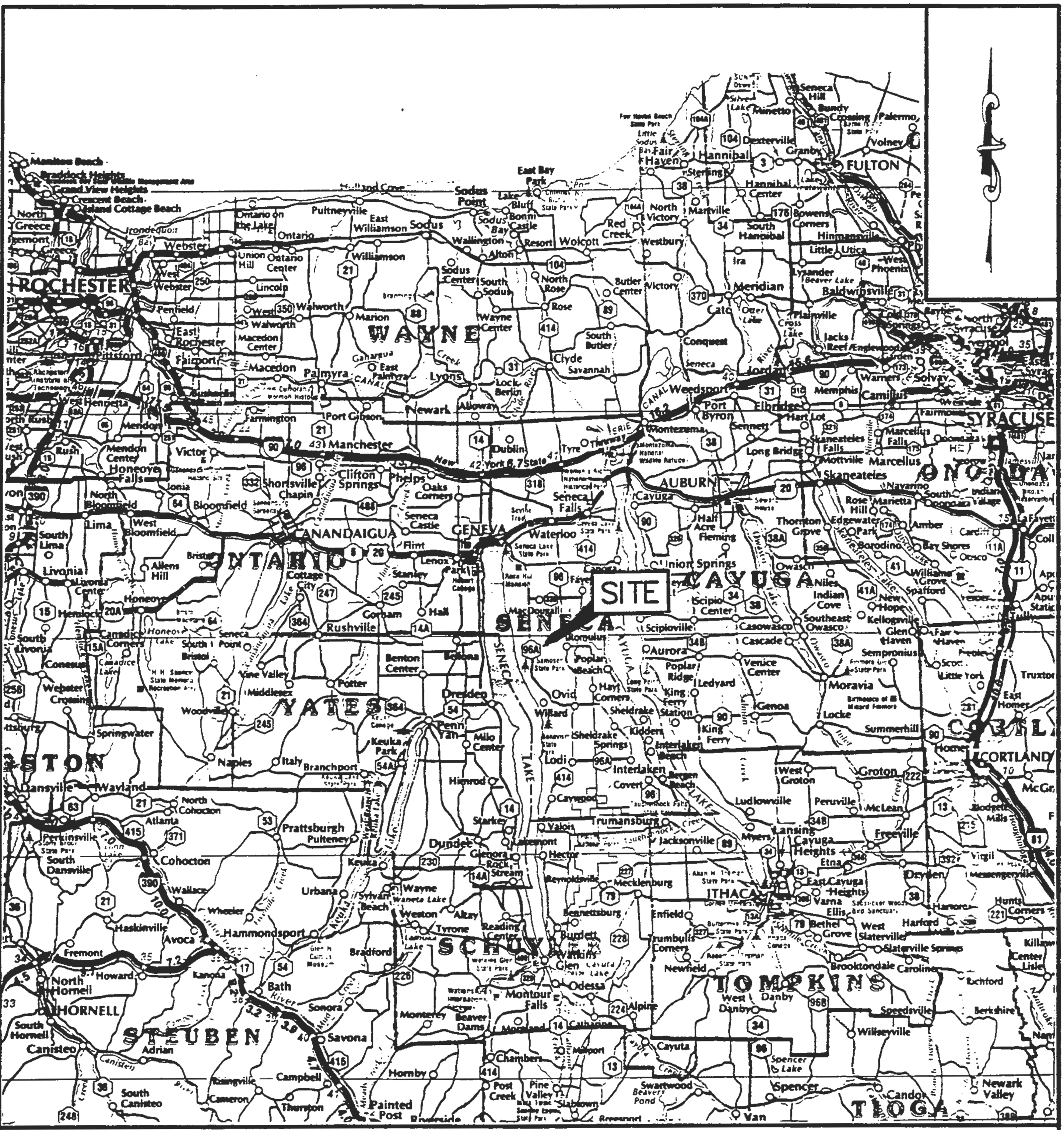
1.1 SITE HISTORY AND CONTAMINANTS

SEDA is located in the town of Romulus, in Seneca County, New York and occupies approximately 10,600 acres. Four larger cities surrounding the Seneca Army Depot are Geneva and Rochester to the north and west, Syracuse to the northeast, and Ithaca to the south. State Routes 96A and 96 neighbor the facility to the west and east, respectively. The location of the Depot is presented in Figure 1-1.

Since its inception in 1941, SEDA's primary mission was to receive, store, maintain, and supply military items. Included in this mission was the disposal of military ammunition and explosives by both burning and detonation. Munitions were open-burned at the OB Grounds site pads at SEDA up until 1987.

The OB Grounds are located in the northwestern section of SEDA. The OB Grounds is situated on sloping terrain vegetated with grass and small brush and generally drains to the east-northeast via a series of drainage ditches and culverts into Reeder Creek.

Due to the poorly drained soils, and the burning activities being performed on top of the land surface, the individual burn pads were later built up with crushed or broken shale to allow for a



NOTE

DRAWING BASED ON MAP OF NEW YORK STATE, BY MAP WORKS, INC., ROCHESTER NEW YORK, DATED 1998.

0 5 10 15 20 25 Miles

0 5 10 15 20 25 30 35 Kilometers

One inch equals approximately 11.7 miles or 19 kilometers.

REMEDIAL ACTION AT THE OPEN BURNING GROUNDS (OB)
SENECA ARMY DEPOT ACTIVITY (SEDA)
ROMULUS, NEW YORK

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

SITE LOCATION MAP

WESTON
MANAGERS DESIGNERS/CONSULTANTS
MANCHESTER NEW HAMPSHIRE

DRAWN	A.J.M.
DATE	AUG. 1998
FIGURE NO.	1-1

FILE NAME: G:\DESIGN\DWG\ACOE\SENECA\WP\FIG1-1 (PLOT 1=1)

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drier burn of the waste. The burn tray is made of a metal and is located on top of a concrete pad. The location of the OB Grounds within SEDA is shown in Figure 1-2.

Within the approximate 30 acres of the northern section of SEDA, are nine separate burning pads ranging from 100 ft by 100 ft to 300 ft by 800 ft. Below each pad are native soils overlain with broken shale. Roads covered with crushed shale provide access to and across the site to the concrete burn pads.

A total of 38 low-lying wetland areas have been identified in the vicinity of the OB Grounds. Several borings and monitoring wells have been installed in and around the OB Grounds to characterize the subsurface geology, hydrology, and groundwater chemistry.

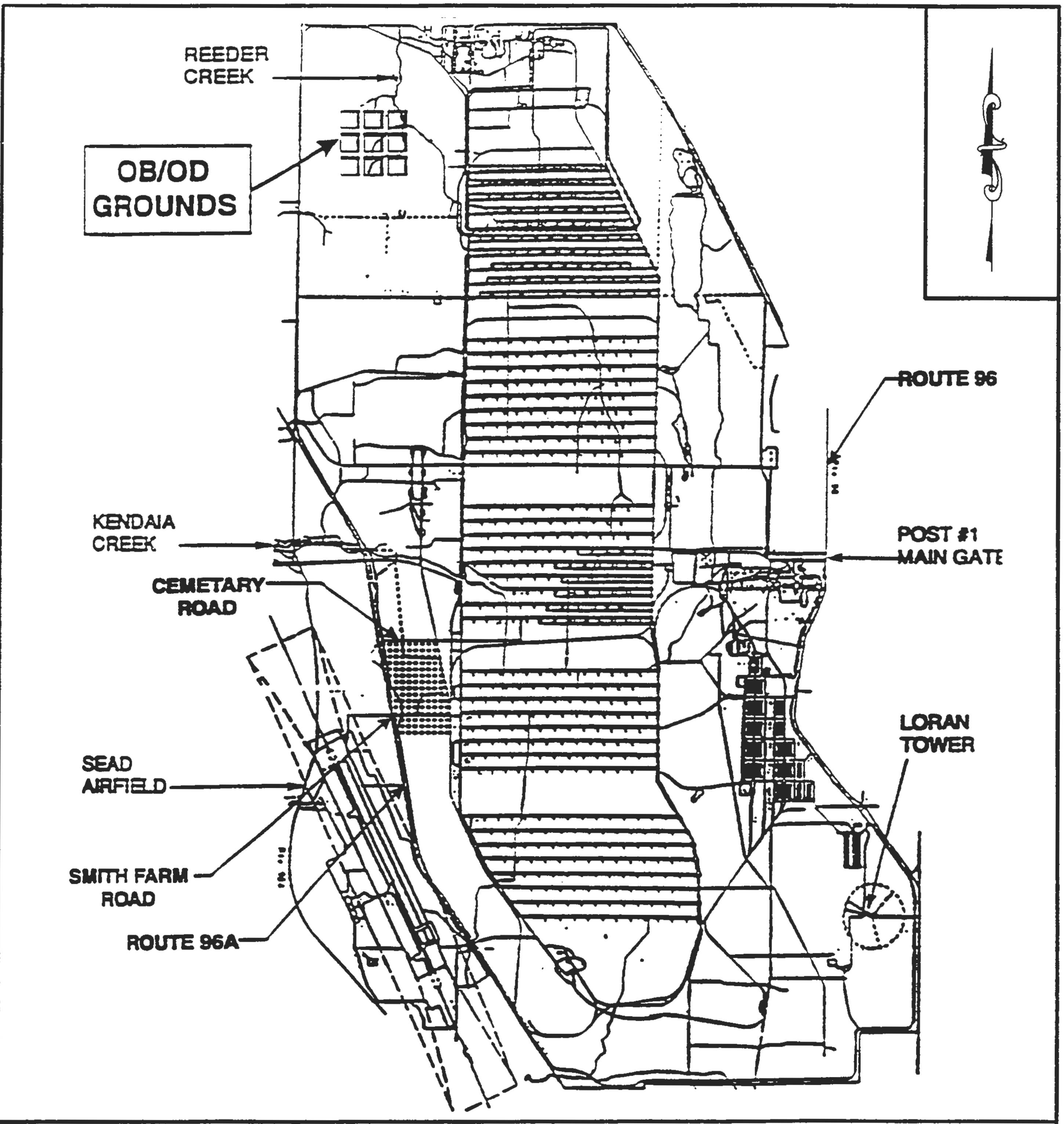
The OB Grounds of SEDA were placed on the National Priorities List (NPL) on July 13, 1989 and the current work at the site is being performed under CERCLA.

1.2 SUMMARY OF EXISTING SITE DATA

The surface soils in the vicinity of the OB Grounds consist mainly of clay and silty loams. These soils, ranging from 0 to 18 inches thick, provide for poor drainage and have produced approximately 38 emergent wetlands that surround the area. The subsurface soils are largely glacial tills ranging from clayey to sandy in nature and have a high content of coarse material.

Soil samples collected during the RI/FS defined areas within the OB Grounds that exceeded the remediation goal of 500 mg/kg total lead. It is estimated that approximately 18,000 cubic yards (cy) of soil will require excavation and off-site disposal. Of the 18,000 cy, it is also estimated that 16,000 cy will fail the toxicity characteristic leaching procedure (TCLP) criteria for leachable lead and will require stabilization prior to off-site disposal.

Reeder Creek is a small perennial stream that originates within SEDA. It flows past the OB Grounds and eventually discharges into Seneca Lake. The sediments within the creek were characterized during the RI and elevated levels of metals were found. Sediments in these designated areas will be removed as part of this project.



NOTE

DRAWING BASED ON FIGURE 2–2, SENECA
ARMY DEPOT MAP, BY PARSONS ENGINEERING
SCIENCE, INC., DATED FEB. 1997.

REMEDIAL ACTION AT THE OPEN BURNING GROUNDS (OB)
SENECA ARMY DEPOT ACTIVITY (SEDA)
ROMULUS, NEW YORK

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

SEDA MAP

WESTON
MANAGERS DESIGNERS/CONSULTANTS
MANCHESTER NEW HAMPSHIRE

DRAWN	A.J.M.
DATE	AUG. 1998
FIGURE NO.	1–2

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1.3 SITE SPECIFIC SAMPLING AND ANALYSIS PROBLEMS

Because the UXO screening and soil excavation will be performed concurrently with site sampling activities, continuous coordination will be required in order to perform the following: evaluate existing excavation areas and stockpile locations for access limitations through the UXO subcontractor, and to coordinate all sampling events of screened stockpiles and excavated areas with the UXO subcontractor to minimize the potential for exposure to UXO debris. In the event a UXO officer is not available, WESTON's sampling technicians and staff shall only access cleared areas.

SECTION 2

PROJECT ORGANIZATION AND RESPONSIBILITIES

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

This section lists key project personnel and identifies their respective responsibilities.

2.1 PROJECT PERSONNEL

WESTON will provide a staff of experienced administrative and technical professionals to serve as the key personnel for this project. These personnel were selected for their management and technical abilities. WESTON's management team will be led by the Program Manager (Mr. Roberto Rico), the Deputy Program Manager (Mr. Bruce Campbell), and Project Manager (Mr. Christopher Kane). They will be responsible for WESTON's overall performance on this TO. The WESTON project field team will consist of a Site Manager, a Project Engineer/Quality Control (QC) Officer, a Site Safety and Health Officer (SSHO), and one Sampling Technician. The project organization and individuals responsible for implementing the quality assurance (QA) aspects of the Sampling and Analysis Plan (SAP) for the work at SEDA is presented in Figure 2-1. Their responsibilities are indicated in the subsections that follow.

2.1.1 Project Manager

The Project Manager will be responsible for resource planning, schedule coordination, and overall project administration of task-specific activities in accordance with the specifications.

2.1.2 Project QC manager

The Project QC Manager is responsible for ensuring that the program is in compliance with the work plan. The Project QC Manager will perform periodic audits to verify adherence of activities to the provisions of the SAP.

ORGANIZATIONAL CHART

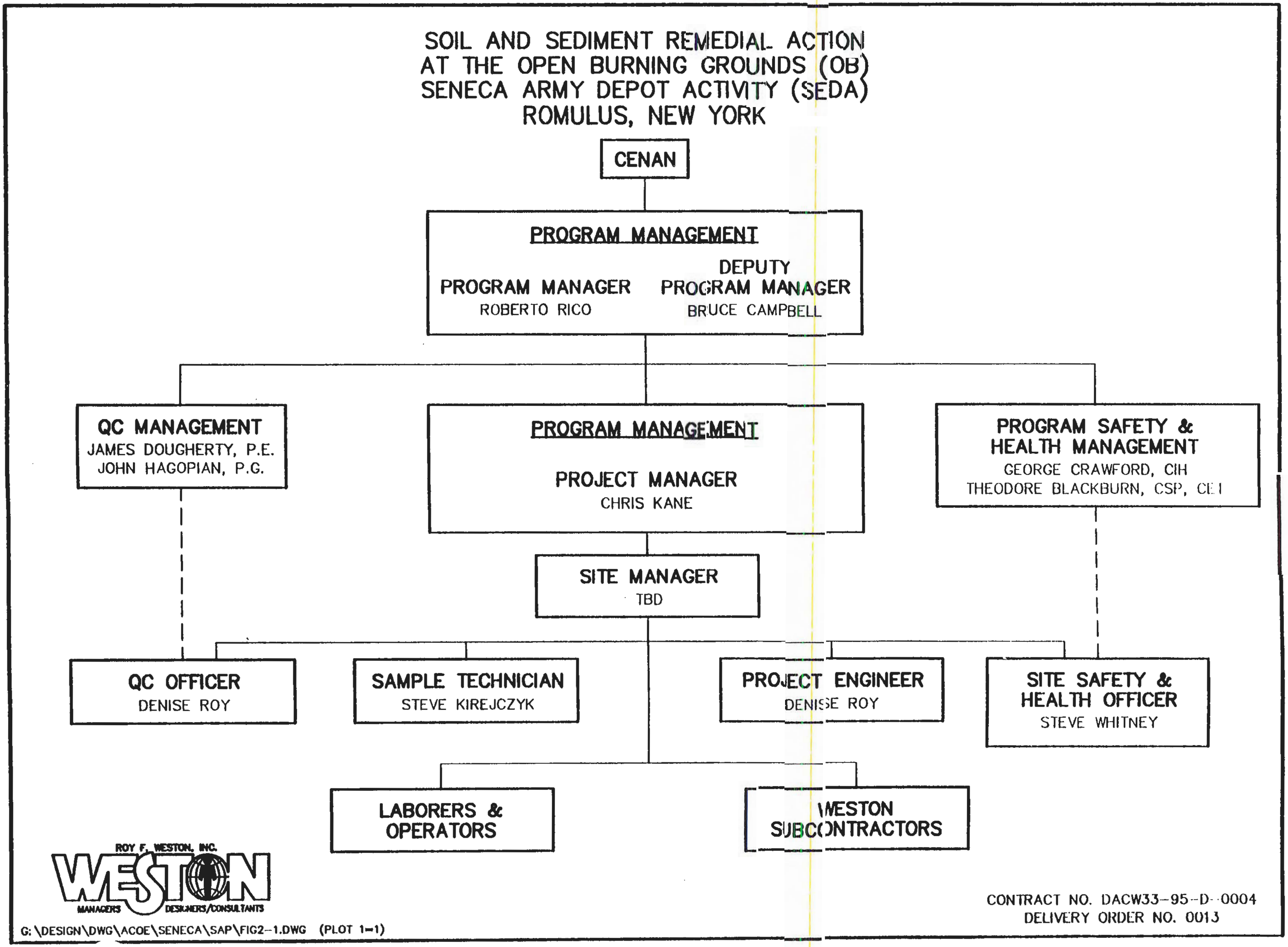


FIG 2-1

2.1.3 Project Quality Control Officer

The Project Quality Control Officer is responsible for ensuring the implementation of the SAP as it applies to field sampling and analysis processes for the site. Specifically, the Project Quality Control Officer is responsible for overseeing the following during sampling activities:

- Proper sample container preparation and labeling.
- Sample preservation and transportation.
- Sample chain-of-custody.
- Proper sampling procedure (i.e., equipment calibrations).
- Sample identification.
- Field documentation.

2.1.4 Site Manager

The Site Manager (SM) reports to the Project Manager and is responsible for supervising field implementation of the project. The SM provides direct supervision of field staff and together with the Site Safety and Health Officer (SSHO) is responsible for ensuring that all personnel adhere to the requirements of the Site Safety and Health Plan (SSHP).

2.1.5 Program Safety Managers

The Program Safety Managers (PSMs) are responsible for the development, implementation, and oversight of the Health and Safety Program and the SSHP. The PSMs ensure that the SSHP complies with all federal, state, United States Army Corps of Engineers (USACE), and local health and safety requirements. If necessary, he/she can modify specific aspects of the SSHP to adjust for on-site changes that affect safety. The PSMs will coordinate with the SSHO on all modifications to the SSHP, and will be available for consultation when required.

2.1.6 Site Safety and Health Officer

The SSHO is responsible for on-site implementation and enforcement of the SSHP, air monitoring, accident reporting, and overall site safety. The SSHO has the authority to halt any project phase or operation deemed either inherently dangerous to life and health, or not in compliance with the SSHP. In addition, the SSHO can remove from the project any person who is deemed inherently unsafe or a threat to the safety of other individuals at or in the vicinity of the project. The SSHO reports directly to the PM but receives technical oversight from the PSMs. The SSHO will supervise all of the field construction activities as described in the SOW. The SSHO will ensure that the remedial actions conform to the requirements of the Work Plan and the SSHP. The SSHO will also assist with sample collection.

2.1.7 Project Engineer

The Project Engineer will serve as the Sampling Officer and will coordinate all project sampling activities. The Project Engineer will perform a dual role as QC Officer. The sampling responsibilities will include:

- Daily implementation of the SAP.
- Documentation of deviations from the SAP, with explanation.
- Provide sampling instructions and oversight.
- Coordinate sampling activities with the off-site laboratory.
- Preliminary review of laboratory data.
- Establish a data tracking and management system.
- Assign sample identification number.
- Assign and direct sampling tasks to WESTON technicians.

2.1.8 Field Personnel

Field personnel are responsible for sample collection, initiation of the chain of custody, and the shipment of the samples to the laboratory. All field personnel will have documented experience with the collection of hazardous waste samples and meet all health and safety requirements for this project.

2.2 LABORATORY RESPONSIBILITIES

2.2.1 Analytical Laboratory

Laboratory QC procedures and responsibilities will be in accordance with the analytical laboratory's CENAE-approved Quality Assurance Project Plan (QAPP), and the SAP. It is anticipated that WESTON will be responsible for collecting confirmation, water treatment. and disposal characterization samples.

The laboratory analyses will be conducted by Ecology and Environment Inc., Lancaster. NY, a USACE validated analytical laboratory. The laboratory Project Manager responsibilities and staffing are detailed in the following subsections.

2.2.1.1 Analytical Laboratory Manager

The Analytical Laboratory Manager is responsible for ensuring that all analytical tasks for this project are conducted according to the requirements of the SAP.

2.2.1.2 Laboratory Project Manager

The Laboratory Project Manager is responsible for scheduling project analytical requirements, monitoring analytical status/deadlines, approving laboratory reports, and coordinating data revisions/corrections and resubmitting packages to project staff. The Laboratory Project Manager will prepare/review analytical work and ensure that laboratory personnel understand and conform to the elements of the SAP that are related to their activities.

2.2.1.3 Laboratory QA Manager

The Laboratory Quality Assurance (QA) Manager will ensure conformance with authorized policies, procedures, and sound practices, and will recommend improvements as necessary. The Laboratory QA Manager will inform the Laboratory Project Manager of nonconformance to the SAP. In addition, the Laboratory QA Manager may approve laboratory data before reporting or transferring data to permanent storage and be responsible for maintaining supporting information and other performance indicators to demonstrate that the systems that produced the data were in control. The Laboratory QA Manager will also review results of internal QA audits and recommend corrective actions and schedules for their implementation.

2.2.1.4 *Laboratory Chemists/Technicians*

An effective laboratory QA program depends on the performance of all laboratory staff performing analyses. The responsibilities of laboratory chemists and technicians include:

- Performing initial review of QC data for acceptability.
- Recording data in bound laboratory notebooks.
- Informing direct supervisors of any problems with instruments or methods to ensure that prompt and effective corrective action is taken.

2.2.2 QA Laboratory

The QA Laboratory will periodically analyze samples for comparison against the results of the analytical laboratory for QA purposes. WESTON will be responsible for collecting and submitting samples to be sent to the QA Laboratory. The QA laboratory for this project as assigned by the CENAE is as follows:

Severn Trent Laboratories, Inc.
55 South Park Drive
Colchester, VT 05446
Project Manager: Mr. Brian Blair
Chemist: Mr. Mark Koenig

All samples will be submitted to the QA laboratory under QA project number E0839.

SECTION 3

SCOPE AND OBJECTIVES

3. SCOPE AND OBJECTIVES

This section outlines the objectives of the sampling effort, QA and QC measures, and identifies the uses of the data that will be generated during the project.

3.1 PROJECT PURPOSE

The objective of this remediation effort is to excavate and screen all soils with lead ≥500 mg/kg for Ordnance and Explosives (OE) clearance, perform onsite treatment of soils which fail criteria, dispose of these soils offsite, utilize existing soil with lead levels <500 mg/kg as backfill material, excavate sediment at Reeder Creek and to provide a 12" soil cover cap over areas of the site with total lead concentrations above 60 mg/kg. The final limits in each of the excavation areas will be determined through confirmation sampling.

Before the excavation begins, the UXO contractor will clear the site for intrusive activities to begin. Excavated soils will be screened to one-inch minus and stockpiled. Oversize material will be processed for OE removal by EODT.

The soils excavated from the OB Grounds will be remediated in two phases. Material will be excavated from East to West by Case number at each burn pad and berm location. Case boundaries will be surveyed and delineated prior to the start of excavation activities. Soils exceeding 500 mg/kg total lead (Case Nos. 1 and 2) will be excavated, sampled and screened first (as defined by the CENAE Section C-Final Technical Specification Soils dated August 1998). These soils will be transported to a staging area and stockpiled in 200 cy piles for TCLP metals sampling to determine the need for solidification/stabilization treatment. Stockpiles that test below the TCLP metals criteria threshold for a characteristic waste will be sent off-site for disposal. Stockpiles with TCLP metals results above the criteria threshold will be treated on-site. Following treatment, the piles will either be retreated (if failing TCLP parameters) or disposed of offsite. The stockpiles will be characterized as required by the disposal facility and each pile will be tested for TCLP metals for disposal at a minimum. A bench-scale process study shall be performed on the solidified/stabilized soil in order to determine its effectiveness prior to full scale operation. Verification samples will be collected to determine treatment prior to convening full-scale treatment.

Soils <500 mg/kg total lead (Case No. 3) will be excavated and screened second (as defined by the CENAE Section C-Final Technical Specification Soils dated August 1998). These soils will be transported to a staging area and placed in 200 cy stock-piles. The piles will be tested for total lead. If the soils are <500 mg/kg, the material will be used as backfill on-site and/or stockpiled for long term storage. If the soils exceed the total lead criteria, the material will be resampled for TCLP metals and treated/disposed off-site as previously described for Case No. 1 and 2 soils.

Sediments in the adjacent Reeder Creek were found to contain elevated levels of barium, copper, lead, and zinc. These sediments will be excavated, stockpiled, and tested in a similar manner to Case 1 soils that are removed by the UXO contractor during the work in the OB Grounds. Sediments will also be stabilized, if necessary, for off-site disposal.

Confirmation samples for total lead will be collected in all burn pad excavations. Confirmation samples will not be collected along the Reeder creek bed following sediment excavation.

After excavation of the soil and sediment is complete, one foot of top soil will be removed from the entire 30 acre site. Samples of the surficial soil remaining on the site will be collected in a grid (one sample per 10,000 sf) to determine areas of the site that require additional clean cover material. Areas with total lead concentrations greater than 60 mg/kg will be covered. This soil cover will minimize the risk of contact with surficial soils during future activities at the site. The covered area will be revegetated after capping operations are complete.

Throughout the excavation activities in the OB Grounds and at Reeder Creek, it will be necessary to dewater the excavations and treat the accumulated water prior to discharge. Samples of the water will be collected to determine treatment effectiveness and to ensure compliance with the NYSDEC substantial equivalent SPDES discharge permit criteria.

Sampling rationale and procedures for each sample type are described in Section 4.0 Field Activities.

3.2 GENERAL QA/QC PROCEDURES

Quality Control samples will be collected and will include field duplicates, equipment and trip blanks (as necessary), and matrix spike/matrix spike duplicates (MS/MSDs). For each matrix and analytical parameter, 1 field duplicate sample will be collected for every 10 field samples and 1 MS/MSD sample will be collected for every 20 field samples. QC samples will not be collected for disposal characterization samples. Equipment blanks will be collected at a frequency of 1 per 20 soil/sediment per event. A trip blank sample will be sent in every cooler containing VOC samples at a frequency of 1 in 10 samples for VOCs analysis. These samples will be prepared and preserved at the laboratory and stored at 4°C in an onsite refrigerator prior to shipment with VOC samples remember, there is a hold time for VOCs analysis for trip blanks as well. Trip blanks will not be collected for TCLP VOC analyses. As appropriate, temperature blanks may be prepared and submitted with each cooler of samples.

QA samples will be split samples of field duplicates and QC samples. These samples will be submitted to the QA laboratory to monitor field sampling, packaging/shipping activities, and the quality of analysis. QA samples will not be collected for any field screening activities or disposal characterization samples. One QA duplicate sample will be collected for every 10 QA samples.

All field sampling efforts will be coordinated with the SEDA FFA in order for regulators to perform QA. WESTON will give SEDA FFA 30 days notice prior to site mobilization and the first day of sampling. Notification of specific sampling dates will not be necessary since sampling efforts will continue daily during on-site activities.

SECTION 4

FIELD ACTIVITIES

4. FIELD ACTIVITIES

This section identifies specific rationales, equipment, and procedures for conducting the required sampling at SEDA. Table 4-1 summarizes anticipated number of samples, parameters, and QA/QC samples for the OB Grounds project.

4.1 SOIL AND SEDIMENT STOCKPILE SAMPLES

Samples from the excavated soil stockpiles (Cases 1 and 2), creek bed sediments and stabilized soils will be collected and analyzed for TCLP parameters to determine disposal treatment and/or costing requirements. Case 3 soils will be excavated from areas with less than 500 mg/kg total lead and will be sampled for total lead.

4.1.1 Rationale

Soil excavated from individual contaminated areas within the OB Grounds (Case 1-3 soils) will be segregated and placed into 200 cy stockpiles within the soils stockpile staging area. Prior to initiating transportation and disposal activities for excavated soils, each soil and sediment stockpile (except Case No. 3) will be sampled for TCLP metals criteria to determine if on-site treatment is required prior to disposal. Soils that fail the TCLP metals will be treated on site with stabilization. Case 3 soils will be sampled for total lead. Soils which contain lead at concentrations less than 500 mg/kg will be used as backfill material following sample results. If Case 3 soil total lead values are equal to or greater than 500 mg/kg, the TCLP metals testing will be performed to determine if these soils can be disposed off-site without treatment or if stabilization will be necessary. Additional samples for Case 3 TCLP analysis have not been included in Table 4-1. For every 10 TCLP metals samples collected for Case 1 and Case 2 soils, a full parameter TCLP sample will be collected.

TABL -1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
Soil, Sediment, and Stabilized Soil Stockpiles															
Case III[1]	Soil	Total Pb	3050B/6010B	1 in 200 cy	69,700	349	35	0	18	0	402	35	4	0	0
Case II[1]	Soil	TCLP Metals	1311/6010B	1 in 200 cy	2,000	10	1	0	1	0	12	1	1	0	0
Case I	Soil	TCLP Metals	1311/6010B	1 in 200 cy	16,000	80	8	0	4	0	92	8	1	0	0
Creek Sediments[1]	Sediment	TCLP Metals	1311/6010B	1 in 200 cy	1,200	6	1	0	1	0	8	1	1	0	0
Stabilized Soils[2]	Soil	TCLP Metals	1311/6010B	1 in 200 cy	20,000	100	10	0	5	0	115	10	1	0	0
Soil/Sediment (Case I, II) [3]	Soil/ Sediment	Full TCLP[6]	1311	1 in 2000 cy	39,200	20	2	0	1	0	23	2	1	0	0
Site perimeter/grid															
Site grid[9]	Soil	Total Pb	3050B/6010B	1 per 10000 sf	1,119,250	152	12	0	6	6	176	12	2	0	1
Soil Characterization for Off-Site Disposal[7]															
Untreated Soil	Soil	Ignitability	1010	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
(Case II)		Reactivity	SW846-7.3.3.2/7.3.4.2	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Corrosivity	9045A	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Percent Moist.	2540G	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		pH	9045C	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Explosives	8330	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Paint Filter	9095	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		VOC	5030A/8260B	1 in 1 ls	1	1	0	1	0	0	2	0	0	0	0
		SVOC	3541B/8270C	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		TAL metals[8]	3050B/6010B	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Full TCLP[6]	1311	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		PEST	3540C/8081A	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		PCB	3540C/8082	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0

TABLE 4-1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
Stabilized Soil	Soil	Ignitability	1010	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
(Case I)		Reactivity	SW846-7.3.3.2/7.3.4.2	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Corrosivity	9045A	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Percent Moist.	2540G	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		pH	9045C	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Explosives	8330	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Paint Filter	9095	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		VOC	5030A/8260B	1 in 1 ls	1	1	0	1	0	0	2	0	0	0	0
		SVOC	3541B/8270C	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		TAL metals[8]	3050B/6010B	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		Full TCLP[6]	1311	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		PEST	3540C/8081A	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
		PCB	3540C/8082	1 in 1 ls	1	1	0	0	0	0	1	0	0	0	0
Bench Testing															
Bench Ver.	Soil	TCLP Pb	1311/6010B	1 in 50 cy	200	4	0	0	0	0	4	0	0	0	0
Miscellaneous Debris and Post-Construction Sampling															
Bulk PPE	Solid	Ignitability	1010	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		Reactivity	SW846-7.3.3.2/7.3.4.2	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		Corrosivity	9045A	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		Percent Moist.	2540G	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		pH	9045C	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		VOC	5030A/8260B	1 in 20 cy	40	2	0	1	0	0	3	0	0	0	0
		SVOC	3541B/8270C	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		Full TCLP[6]	1311	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		PEST	3540C/8081A	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0
		PCB	3540C/8082	1 in 20 cy	40	2	0	0	0	0	2	0	0	0	0

TABLE 4-1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
Bulk Liner	Solid	Ignitability	1010	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		Reactivity	SW846-7.3.3.2/7.3.4.2	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		Corrosivity	9045A	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		Percent Moist.	2540G	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		pH	9045C	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		VOC	5030A/8260B	1 in 40000 sf	300000	8	0	1	0	0	9	0	0	0	0
		SVOC	3541B/8270C	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		TAL metals[8]	3050B/6010B	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		Full TCLP[6]	1311	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		PEST	3540C/8081A	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
		PCB	3540C/8082	1 in 40000 sf	300000	8	0	0	0	0	8	0	0	0	0
Staging Area	Soil	Total Pb	3050B/6010B	2 in 10000 sf	300000	60	6	0	4	4	74	3	1	0	1
Haul Road	Soil	Total Pb	3050B/6010B	1 in 200 lf	3000	15	2	0	1	1	19	2	1	0	1
Holding Tanks	Wipes	TAL Metals[8]	3050B/6010B	2 per 1 tank[5]	10	20	2	0	1	1	24	2	1	0	1
Treated Effluent Class C Discharge Criteria															
Wastewater	Aqueous	TAL Metals	3010A/6010B	1 per 1 wk	25	25	3	0	2	0	30	3	1	0	0
		TDS		1 per 1 wk	25	25	3	0	2	0	30	3	1	0	0
		Explosives	8330	1 per 1 wk	25	25	3	0	2	0	30	3	1	0	0
		pH		1 per 1 wk	25	25	3	0	2	0	30	3	1	0	0
		Cyanide	9010B/9012B	1 per 1 wk	25	25	3	0	2	0	30	3	1	0	0

TABLE 4-1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
Pad and Berm Confirmatory Samples															
PAD A															
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,725	2	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	0	0	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,250	1	--	--	--	--	--	--	--	--	--
Case II Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	0	0	--	--	--	--	--	--	--	--	--
Case II Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,750	2	--	--	--	--	--	--	--	--	--
Case II GB-1	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case II GB-1	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	1,700	1	--	--	--	--	--	--	--	--	--
				PAD A TOTAL		14	2	0	1	1	18	2	1	0	1
PAD B															
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	3,875	2	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	0	0	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,975	2	--	--	--	--	--	--	--	--	--
Case I GB-24	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I GB-24	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,400	1	--	--	--	--	--	--	--	--	--
Case I SW-220	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	5	5	--	--	--	--	--	--	--	--	--
Case I SW-220	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	3,800	2	--	--	--	--	--	--	--	--	--
				PAD B TOTAL		20	2	0	1	1	24	2	1	0	1

TABLE [illegible]-1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
PAD C															
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	1,350	1	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	0	0	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	3,575	2	--	--	--	--	--	--	--	--	--
Case I GB2/23/12	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	12	12	--	--	--	--	--	--	--	--	--
Case I GB2/23/12	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	29,450	12	--	--	--	--	--	--	--	--	--
				PAD C TOTAL		31	4	0	2	2	39	4	1	0	1
PAD D															
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,225	1	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	0	0	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	4,625	2	--	--	--	--	--	--	--	--	--
Case I GB-13	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I GB-13	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,825	2	--	--	--	--	--	--	--	--	--
				PAD D TOTAL		13	2	0	1	1	17	2	1	0	1
PAD E															
Case I Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	1	1	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	3,025	2	--	--	--	--	--	--	--	--	--
				PAD E TOTAL		3	1	0	1	1	6	1	1	0	1

TABLE 4-1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
PAD F															
Case I Berm South	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case I Berm South	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	7,575	4	--	--	--	--	--	--	--	--	--
Case I Berm North	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	1	1	--	--	--	--	--	--	--	--	--
Case I Berm North	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	900	1	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	6	6	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	10,075	5	--	--	--	--	--	--	--	--	--
Case I GB-15	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I GB-15	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	4,650	2	--	--	--	--	--	--	--	--	--
Case II Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case II Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	1,705	1	--	--	--	--	--	--	--	--	--
				PAD F TOTAL		28	3	0	2	2	35	3	1	0	1
PAD G															
Case I Berm East	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case I Berm East	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	4,100	2	--	--	--	--	--	--	--	--	--
Case I Berm West	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case I Berm West	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	8,350	4	--	--	--	--	--	--	--	--	--
Case I Pad East	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I Pad East	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	9,255	4	--	--	--	--	--	--	--	--	--
Case I Pad West	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I Pad West	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	7,425	3	--	--	--	--	--	--	--	--	--
Case II Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	0	0	--	--	--	--	--	--	--	--	--
Case II Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	3,675	2	--	--	--	--	--	--	--	--	--
Case II Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	3	3	--	--	--	--	--	--	--	--	--
Case II Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	8,700	4	--	--	--	--	--	--	--	--	--
				PAD G TOTAL		34	4	0	2	2	42	4	1	0	1

TABL. 1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
PAD H															
Case I Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case I Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	8,950	4	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	3	3	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,500	1	--	--	--	--	--	--	--	--	--
Case I GB 19/34	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	4	4	--	--	--	--	--	--	--	--	--
Case I GB 19/34	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,575	2	--	--	--	--	--	--	--	--	--
PAD H TOTAL						16	2	0	1	1	20	2	1	0	1
PAD J															
Case I Pad	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	7	7	--	--	--	--	--	--	--	--	--
Case I Pad	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	31,200	13	--	--	--	--	--	--	--	--	--
Case II Berm	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case II Berm	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	600	1	--	--	--	--	--	--	--	--	--
PAD J TOTAL						23	3	0	2	2	30	3	1	0	1
LOW LYING HILL															
Case I	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	2	2	--	--	--	--	--	--	--	--	--
Case I	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	2,183	1	--	--	--	--	--	--	--	--	--
Case II	Soil (SW)	Total Pb	3050B/6010B	1 per 1 sdw	1	1	--	--	--	--	--	--	--	--	--
Case II	Soil (FL)	Total Pb	3050B/6010B	1 per 2500 sf	3,293	2	--	--	--	--	--	--	--	--	--
PAD LLH TOTAL						6	1	0	1	1	9	1	1	0	1
TOTAL CONFIRMATORY SAMPLES						**188**	**24**	**0**	**14**	**14**	**240**	**24**	**10**	**0**	**10**

TABLE 4-1
Seneca Army Depot Activity
Open Burning Grounds Soil and Sediment Remediation
Sampling Summary

Sample Event	Sample Matrix	Analysis Req'd	Analytical Method	Frequency	Total Qty	No. Field Samps	QC					QA			
							Dup	Trip Blanks	MS/ MSD	Field Blanks	TOT.	Field Samps	Dup	Trip blanks	Field Blnks
CLEAN FILL															
Fill	Soil	TAL Metals	3050B/6010B	1 per 5000 cy	50000	10	1	0	1	1	13	0	0	0	0
		Explosives	8330	1 per 5000 cy	50000	10	1	0	1	1	13	0	0	0	0
		VOCs	5030A/8260B	1 per 5000 cy	50000	10	1	10	1	1	23	0	0	0	0
		SVOCs	3541B/8270C	1 per 5000 cy	50000	10	1	0	1	1	13	0	0	0	0
		PCB	3540C/8082	1 per 5000 cy	50000	10	1	0	1	1	13	0	0	0	0
		PEST	3540C/8081A	1 per 5000 cy	50000	10	1	0	1	1	13	0	0	0	0
Top Soil	Soil	TAL Metals	3050B/6010B	1 per 5000 cy	19100	4	1	0	1	1	7	0	0	0	0
		Explosives	8330	1 per 5000 cy	19100	4	1	0	1	1	7	0	0	0	0
		VOCs	5030A/8260B	1 per 5000 cy	19100	4	1	4	1	1	11	0	0	0	0
		SVOCs	3541B/8270C	1 per 5000 cy	19100	4	1	0	1	1	7	0	0	0	0
		PCB	3540C/8082	1 per 5000 cy	19100	4	1	0	1	1	7	0	0	0	0
		PEST	3540C/8081A	1 per 5000 cy	19100	4	1	0	1	1	7	0	0	0	0
Organic Fill For Wetland	Soil	TAL Metals	3050B/6010B	1 per 5000 cy	4000	1	1	0	1	1	4	0	0	0	0
		Explosives	8330	1 per 5000 cy	4000	1	1	0	1	1	4	0	0	0	0
		VOCs	5030A/8260B	1 per 5000 cy	4000	1	1	1	1	1	5	0	0	0	0
		SVOCs	3541B/8270C	1 per 5000 cy	4000	1	1	0	1	1	4	0	0	0	0
		PCB	3540C/8082	1 per 5000 cy	4000	1	1	0	1	1	4	0	0	0	0
		PEST	3540C/8081A	1 per 5000 cy	4000	1	1	0	1	1	4	0	0	0	0
AIR SAMPLES															
Personnel	Air	Lead (total)	NIOSH 7300	4 per 1 wk	9	36	0	0	0	0	0	0	0	0	0
				TOTAL ANALYSES		1353	136	19	84	44	1636				

Method numbers taken from SW846 Third Edition Final (Promulgated) Update III.

Notes:

1. Quantities based on revised numbers from CENAE: 12,000 cy Case III (3,300 cy Low Lying Hills and 8,700 cy Berms), 2,000 cy Case II soils, and 1,200 cy Creek Sediments. An additional 12,100 cy Case III soils is added to the quantity to account for the soils to be excavated and sampled from the 2.5 acres of wetland reconstruction and an additional 45,600 cy will be generated from excavation of the top one foot of soil from the entire 30 acre site. Note that if Case III soils exceed 500 mg/kg total lead, additional testing and off-site disposal will be required. In addition, stabilization of these soils may be required if TCLP lead exceeds 5 mg/L.
2. Volume based on 30,000 tons provided in RFP and density of 1.5 tons/cy.
3. Meets requirement to run full TCLP for every tenth TCLP metals performed. Volume is based on sum of volumes of soils to be tested for TCLP metals, including 2,000 cy Case II soils, 16,000 cy Case I soils, 1,200 cy creek sediments, and 20,000 cy stabilized soils.
4. Frequency assumed to be 1 per 5,000 cy for organic fill, volume based on one foot over 2.5 acres area.
5. Storage tanks assumed to be 20,000 gallons each. Separate wipe sample for TAL metals and mercury.
6. Full TCLP = TCLP VOCs (1311/8260B), SVOCs (1311/8270B), metals (1311/6010B except mercury 7470), pesticides (1311/8150), and herbicides (1311/8150).

7. One full sample characterization of each waste stream (treated and untreated) is required. The TCLP metals results from stockpile testing of treated and untreated soils (1 sample per 200 cy) will satisfy remaining off-site disposal characterization requirements.
8. Method 3050A/6010B except mercury Method 7471.
9. Total number of samples includes 112 grid samples and 40 perimeter samples.

Assumptions:

QC Samples

QC Samples (except for trip blanks) are not required for untreated stabilized soil characterization, bench verification, and staging liner samples.

Duplicate sample frequency is 1 per 10 samples per sampling event. QC samples are assume to be required for all other sampling events.

Trip blanks are required at a rate of 1 trip blank for each 10 VOCs samples for each shipment of VOCs, including shipments of soil, water, solids, and wipe samples. For wastewater, it is assumed that 25 separate sample shipments with VOCs will occur; therefore, 25 separate trip blanks are assumed.

MS/MSDs - frequency is 1 per 20 field samples per sampling event.

Field blanks will be collected for staging area, haulroad, holding tanks, clean fill, and perimeter and excavation confirmatory samples only. Field blanks will be collected at a frequency of 1 sample per 20 field samples per event. No blanks are necessary for wastewater sampling because direct sampling into sample bottles is assumed.

Sampling events are considered the following: <500 mg/kg soils, 500 - 800 mg/kg soils, >800 mg/kg soils, creek sediments, stabilized soils, site perimeter, untreated soil characterization, stabiized soil characterization, bench verification, bulk PPE, staging liner, staging area, haul road, holding tanks, wastewater, individual pads and low lying hills, fill, top soil, and organic fill sampling.

QA Samples

QA Field samples will be split with regular field samples at a frequency of 1 per 10 field samples per sampling event.

QA duplicates will be collected 1 per 10 QA field samples per sampling event.

No MS/MSDs will be required for QA samples.

QA trip blanks will be required with all VOC shipments.

QA field blanks will be collected at a frequency of 1 per every 20 QA field samples.

QA samples will not be collected for off-site borrow samples.

4.1.1.1 Discrete/Composite Sampling Requirements

Samples from the stockpiled soil and sediment will be collected as five-point composite samples to obtain a representation of the average stockpile contaminant concentrations. The five discrete sample points within the soil or sediment stockpile will be selected so that they represent material in the entire stockpile.

4.1.1.2 Sample Collection and Field Testing

Each stockpile characterization (except for Case 3 soils) sample will be analyzed for TCLP metals using EPA Method 1311/6010B. In addition to the TCLP metals analysis, one complete toxicity characteristic by TCLP EPA Method 1311 will be performed for every 10 TCLP metals samples analyzed. Other analysis may be performed periodically depending on specific requirements of the disposal facilities. Case 3 soils will be analyzed for total lead (method 3050A/6010B).

4.1.1.3 Background, QA/QC, and Blank Samples and Frequency

Data from the RI/FS and USEPA guidance has been used to define the contaminants of concern in each excavation area within the OB Grounds at SEDA. No background samples are necessary.

QA/QC and blank samples will be collected at the frequency identified in Section 3.2 during the routine analysis of the 200 cy stockpiles samples. QA/QC samples (except for the trip blanks) will not be collected for samples collected as a result of disposal facility-specific analytical requirements.

4.1.2 Procedures

This section outlines the specific procedures that will be used when collecting stockpile characterization samples.

4.1.2.1 Sampling Methods

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades. A decontaminated stainless steel bowl (or equivalent) will be used for sample homogenization.

4.1.2.2 Field Measurement Procedures and Criteria

Field measurement procedures will not be used to determine contaminant concentrations in the stockpiled soil. Chemical analysis will be performed by an off-site laboratory.

4.1.2.3 Sampling for Chemical Analysis

The five discrete sample points that make up the composite stockpile sample will be selected in such a manner that they are representative of the material in the entire stockpile. At each of the five discrete locations, a cleaned shovel will be used to dig a hole to a minimum depth of 18 inches below the surface of the stockpile. Soil or sediment samples will be manually collected from the pre-dug locations using either decontaminated stainless steel or disposable scoops or spades. The material from the mixing bowl will be transferred into the appropriate sample containers. MS/MSD, duplicate, and QA samples will be taken, as necessary, from the homogenized sample volume.

Prior to recovering the soil stockpile following sample collection, each sample location will be marked so that sample points can be located in the event that retesting is necessary. Measurements will be taken of the sample locations to document stockpile and sample identification as necessary. Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.1.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan

(QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.1.2.5 Field Quality Control Procedures

At least one equipment blank will be collected for every 20 soil samples per event (events are defined as Case 1, Case 2, Case 3, creek sediment, and stabilized soil sampling). This sample will be used to assess whether the sampling equipment or sample containers introduce contamination. The sample will also be used to perform QC checks on the equipment decontamination procedures.

To collect the equipment blank, reagent grade deionized water will be poured over the decontaminated sampling equipment into a 1 L HDPE container containing HNO^3 preservative. The sample containers will then be capped and chilled at 4°C until analysis.

4.1.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-2. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.2 SITE PERIMETER / GRID SOIL SAMPLES

After burn pad excavation activities and one foot of top soil has been removed from the 30 acre site area, surface soil samples will be collected from the entire 30 acre site area in a grid. These sample results will be used to determine the required limits of soil cover.

4.2.1 Rationale

The soil samples collected from the OB Grounds grid will be used to determine the required limits of clean cover material. The area to be covered will include all areas within the OB

Grounds which exhibit total lead concentrations of 60 mg/kg or greater. Samples will be taken at a frequency of one sample every 10,000 square feet (sf) over the entire site.

4.2.1.1 Discrete/Composite Sampling Requirements

All grid/perimeter confirmation samples will be taken as discrete samples.

Table 4-2

Equipment Decontamination Process
Seneca Army Depot Activity OB Grounds Remediation

	Detergent Wash	Tap Water	Acid Rinse	Tap Water	Solvent Rinse[1]	Deionized Water	Air Dry
VOA Low MW CMPDS[2]	X	X			Methanol	X	X
BNA PEST/PCBs High MW CMPDS[2]	X	X			Hexane	X	X
Organic Bases[3]	X	X	1% Sol. (dil.acid)	X	Iso-propyl Alcohol	X	X
Organic Acids[4]	X (dil.Base)	X			Iso-propyl Alcohol	X	X
Trace Metals	X	X	10% Sol.	X	X	X	X
Salts	X	X				X	X
Acidic CMPDS	X (dil.Base)	X				X	X
Basic CMPDS	X	X	1% Sol. (dil.acid)	X		X	X

*Reference: EM 200-1-3

[1] Solvent rinses vary in polarity which leads to varying solubilizing properties. Deciding appropriate solvent rinses should first identify if a known or suspect contaminant requires removal from sampling equipment. Optimum solvents for contaminants are included in this table.

[2] MW CMPDS = molecular weight compounds.

[3] Organic bases include Amines, Hydrazines.

[4] Organic acids include Phenols, Thiols, Nitro and Sulfonic compounds.

4.2.1.2 *Sample Collection and Field Testing*

Surface soil samples from the grid/perimeter of the OB Grounds will be collected and sent to an off-site laboratory for analysis. These samples will be analyzed for total lead using EPA Method 3050A/6010B.

4.2.1.3 *Background, QA/QC, and Blank Samples and Frequency*

Data from the Remedial Investigation Report (September 1994) and USEPA guidance has been used to establish the permissible residual concentration of lead in cover soils in the OB Grounds at SEDA. Collection of background samples is not necessary.

QA/QC and blank samples will be collected at the frequency identified in Section 3.2.

4.2.2 Procedures

This section outlines specific procedures that will be used when collecting grid/perimeter confirmation samples.

4.2.2.1 *Sampling Methods*

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades.

4.2.2.2 *Field Measurement Procedures and Criteria*

Field measurement procedures will not be used to determine lead concentrations in the soil.

4.2.2.3 *Sampling for Chemical Analysis*

Surface soil samples from the grid/perimeter of the proposed cover area in the OB Grounds will be collected to determine the final extent and limits of cover. One discrete sample will be collected for every 10,000 sf area of the 30 acre site. Because these samples will be used to evaluate lead that is readily accessible during daily site activities. samples will be collected at the soil surface.

The sample location will be identified and marked. A decontaminated spade or sampling scoop will be used to collect the sample. The soil will be collected and placed into clean and labeled sample containers. In cases where duplicate, MS/MSD, and QA samples are collected, the soil will be collected into a clean mixing container (stainless steel bowl or equivalent), mixed, and then placed into the sample containers. Measurements of the sample locations will be taken as necessary.

Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into coolers for shipment.

4.2.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.2.2.5 Field Quality Control Procedures

At least one equipment blank will be collected for every 20 perimeter soil samples. This sample will be used to assess whether the sampling equipment or sample containers introduce contamination. The sample will also be used to perform QC checks on the equipment decontamination procedures.

To collect the equipment blank, reagent grade deionized water will be poured over the decontaminated sampling equipment into a 1 L HDPE container containing HNO^3 preservative to pH <2. The sample containers will then be capped and chilled at 4°C until analysis.

4.2.2.6 *Decontamination Procedures*

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.3 SOIL CHARACTERIZATION FOR OFF-SITE DISPOSAL

Unstabilized and stabilized soils will require full characterization in accordance with the selected off-site disposal facility's acceptance criteria. Samples of this waste will be collected by WESTON and results will be submitted to the disposal facility before shipment of wastes.

4.3.1 Rationale

These samples must be collected in order to meet the disposal facility's requirements for acceptance. Samples will be analyzed for VOCs, SVOCs, pesticides, PCBs, TAL Metals, full TCLP, ignitability, corrositivity, reactivity, percent moisture, and paint filter per disposal facility requirements. The facility requires this information for each waste stream profile in order to determine the acceptability of the waste. No wastes can be shipped off-site until they are approved. Based on conversations with the off-site disposal facility, only one full characterization sample will be required per waste stream (stabilized soils, unstabilized soils). Following this, the TCLP metals sampling at a frequency of 1 per 200 cy and the TCLP full parameter sampling at a frequency of 1 per 2000 cy will be sufficient (see Section 4.1).

4.3.1.1 *Discrete/Composite Sampling Requirements*

Samples from the stockpiled soil and sediment will be collected as five-point composite samples to obtain a representation of the average stockpile contaminant concentrations. The five discrete sample points within the soil or sediment stockpile will be selected so that they represent material in the entire stockpile. VOC samples, collected as required for disposal characterization, will be collected as discrete samples so that VOCs are not lost during the homogenization process.

4.3.1.2 Sample Collection and Field Testing

Each stockpile characterization sample will be analyzed for TCLP metals using EPA Method 1311/6010B. In addition to the TCLP metals analysis, other parameters such as the complete toxicity characteristic by: TCLP EPA (Method 1311/6010B); VOCs (EPA Method 5030A/8260B); SVOCs (EPA Method 3541/8270C); pesticide/PCB (3550/8081A); ignitability (Method 1010); reactivity (Method 7.3.3.2/7.3.4.2); corrosivity (Method 9045); percent moisture (2540G); paint filter (9095); and TAL metals (3050B/6010B) will be performed at a rate of 1 sample per sample train (this may change depending on specific requirements of the disposal facilities).

4.3.1.3 Field Measurement Procedures and Criteria

Field measurement procedures will not be used to determine contaminant concentrations in the stockpiled soil. All analytical will be performed by an off-site laboratory.

4.3.1.4 Sampling for Chemical Analysis

The five discrete sample points that make up the composite stockpiles sample will be selected in such a manner that they are representative of the stockpiled material. At each of the five discrete locations, a clean shovel will be used to dig a hole to a minimum depth of 18 inches below the surface of the stockpile. Stabilized or unstabilized soil samples will be manually collected from the pre-dug locations using either decontaminated stainless steel or disposable scoops or spades. The material from the mixing bowl will be transferred into the appropriate sample containers. MS/MSD, duplicate, and QA samples will be taken as necessary, from the homogenized sample volume.

4.3.1.5 Background, QA/QC, and Blank Samples and Frequency

Data from the RI/FS and USEPA guidance has been used to establish cleanup goals for the OB Grounds at SEDA. No background samples are necessary.

QA/QC samples will be collected at the frequency identified in Section 3.2 and in the Sampling Summary Table 4-2.

4.3.2 Procedures

This section outlines specific procedures that will be used when collecting confirmation samples.

4.3.2.1 Sampling Methods

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades.

4.3.2.2 Field Measurement Procedures and Criteria

No field measurement procedures will be used to determine lead concentrations in the soil. All analytical testing will be performed by an off-site laboratory.

4.3.2.3 Sampling for Chemical Analysis

The five discrete sample points that make up the composite stockpile sample will be selected in such a manner that they are representative of the material in the entire stockpile. At each of the five discrete locations, a cleaned shovel will be used to dig a hole to a minimum depth of 18 inches below the surface of the stockpile. Unstabilized or stabilized soil samples will be manually collected from the pre-dug locations using either decontaminated stainless steel or disposable scoops or spades. The material from the mixing bowl will be transferred into the appropriate sample containers. MS/MSD, duplicate, and QA samples will be taken, as necessary, from the homogenized sample volume. Prior to collecting confirmation samples, the sample location will be identified and marked. A decontaminated spade or sampling scoop will be used to remove any slough from the sample location so that a representative sample can be collected. Once the material has been cleared, the soil will be collected and placed into clean and labeled sample containers. In sampling locations where duplicate, MS/MSD, and QA samples will be collected, the soil will be collected into a clean mixing container, mixed, and then placed into the sample containers. Measurements of the sample locations will be taken as necessary.

Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.3.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.3.2.5 Field Quality Control Procedures

Equipment blanks will not be collected for characterization samples.

4.3.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.4 BENCH-SCALE VERIFICATION SAMPLES

Samples will be collected from bench-scale treatability tests of the metals stabilization process.

4.4.1 Rationale

The stabilized soil samples collected during bench-scale treatability testing will be used to demonstrate treatment performance of the methodology prior to conducting large-scale soil processing.

4.4.1.1 Discrete/Composite Sampling Requirements

Samples from bench-scale treatability tests will be collected before and after soil stabilization. These samples will be collected as five-point composite samples to obtain a representation of the average concentrations of leachable lead before and after treatment. The five discrete sample points will be selected so that they represent material in the entire treatment batch. The results will enable WESTON to determine the effectiveness of the stabilization process.

4.4.1.2 Sample Collection and Field Testing

Each bench-scale verification sample will be analyzed for TCLP lead using EPA Method 1311/6010B.

4.4.1.3 Background, QA/QC, and Blank Samples and Frequency

Background and QA/QC samples will not be collected during the bench-scale treatability tests.

4.4.2 Procedures

This section outlines the specific procedures that will be used when collecting samples from the bench-scale treatability study.

4.4.2.1 Sampling Methods

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades. A decontaminated stainless steel bowl (or equivalent) will be used for sample homogenization.

4.4.2.2 Field Measurement Procedures and Criteria

Field measurement procedures will not be used to determine contaminant concentrations in the stockpiled soil. All analytical will be performed by an off-site laboratory.

4.4.2.3 Sampling for Chemical Analysis

The five discrete sample points that make up the composite stockpile sample will be selected in such a manner that they are representative of the material in the entire batch. At each of the five discrete locations, the scoop will be used to dig into the soil batch. Stabilized soil samples will be manually collected from the pre-dug locations using either decontaminated stainless steel or disposable scoops or spades. Equal portions of material from each discrete location will be placed into a decontaminated stainless steel bowl and homogenized. The material from the mixing bowl will be transferred into the appropriate sample containers. Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.4.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.4.2.5 Field Quality Control Procedures

No equipment blank is to be collected during performance of bench scale testing.

4.4.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.5 BULK PPE AND STAGING LINER

Bulk items including staging liner and PPE will be sampled to determine disposal options.

4.5.1 Rationale

PPE staging liner and associated wastes streams created during work operations will be characterized before off-site disposal. Results will be submitted to the disposal facility. for approval.

4.5.1.1 Discrete/Composite Sampling Requirements

Composite and discrete samples will be taken, as appropriate, in accordance with disposal facility criteria requirements.

4.5.1.2 Sample Collection and Field Testing

Bulk samples will be analyzed for TCLP Metals using EPA Method 1311. In addition to the TCLP Metals analysis, other parameters such as VOCs (EPA Method 5030A/8260B): SVOCs (EPA Method 3541/8270C); Pesticide (3550/8081A); PCB's (3540C/8082); ignitability (Method 1010); reactivity (Method 7.3.3.2/7.3.4.2); and corrosivity (Method 9045C) will be performed depending on specific requirements of the disposal facilities.

4.5.1.3 Background, QA/QC, and Blank Samples and Frequency

Background and QA/QC samples will not be collected during bulk PPE sampling.

4.5.2 Procedures

This section outlines specific procedures that will be used when collecting confirmation samples.

4.5.2.1 Sampling Methods

Representative samples will be collected in accordance with Laboratory requirements for analyzing samples to meet disposal facility criteria.

4.5.2.2 Field Measurement Procedures and Criteria

No field measurement procedures will be used to determine contaminant concentrations in the bulk PPE and liner. All analytical testing will be performed by an off-site laboratory.

4.5.2.3 Sampling for Chemical Analysis

Samples will be collected at the rate of 1 representative sample for every 20 cy of PPE/liner.

4.5.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.5.2.5 Field Quality Control Procedures

No equipment blank sample is to be collected during bulk PPE sampling due to the limited number of samples.

4.5.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.6 STAGING AREA AND HAUL ROAD

Soil samples will be collected from the Staging Area (including treatment area) and the haul road upon completion of backfilling and/or off-site disposal of soils. Based on long term storage requirements for Case 3 soils. WESTON may have limited or restricted access to soils beneath the liner within the staging area.

4.6.1 Rationale

Confirmatory soil samples will be used as the basis of determining presence of contaminants in staging areas and haul roads after soils are removed. These samples will be used to evaluate the presence of contamination at the soil stockpile staging area, water treatment area, and haul roads following remediation. Soils exceeding 500 mg/kg lead will be excavated and disposed of off-site. Soils exceeding 60 mg/kg will be placed beneath the soil cover or stockpiled for long term storage in the staging area.

4.6.1.1 Discrete/Composite Sampling Requirements

Five point composite samples will be taken on both layers of soil.

4.6.1.2 Sample Collection and Field Testing

Soil samples from these areas will be collected and sent to an off-site laboratory for analysis. Confirmation samples will be analyzed for total lead using EPA Method 3050A/6010A.

4.6.1.3 Background, QA/QC, and Blank Samples and Frequency

QA/QC samples will be collected at the frequency identified in Section 3.2.

4.6.2 Procedures

This section outlines specific procedures that will be used when collecting confirmation samples.

4.6.2.1 *Sampling Methods*

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades.

4.6.2.2 *Field Measurement Procedures and Criteria*

No field measurement procedures will be used to determine lead concentrations in the soil. All analytical testing will be performed by an off-site laboratory.

4.6.2.3 *Sampling for Chemical Analysis*

Once soil removal in each area is complete. measurements of the remaining ground surface will be obtained. The composite sample will be collected for every required interval.

The sample location will be identified and marked prior to collecting confirmation samples, since the soils will not be stockpiled. A decontaminated spade or sampling scoop will be used to remove any slough from the sample location so that a representative sample can be collected. Once the material has been cleared, the soil will be collected and placed into clean labeled sample containers. In sampling locations where duplicate, MS/MSD, and QA samples will be collected. the soil will be collected into a clean mixing container, mixed, and then placed into the sample containers. Measurements of the sample locations will be taken as necessary.

Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.6.2.4 *Sample Containers and Preservation Techniques*

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.6.2.5 *Field Quality Control Procedures*

At least one equipment blank will be collected for every 20 soil samples or one per week for weeks that confirmation samples are being collected. This sample will be used to assess whether the sampling equipment or sample containers introduce contamination. The sample will also be used to perform QC checks on the equipment decontamination procedures.

To collect the equipment blank, reagent grade deionized water will be poured over the decontaminated sampling equipment into a 1 L HDPE container containing HNO^3 preservative. The sample containers will then be capped and chilled at 4°C until analysis.

4.6.2.6 *Decontamination Procedures*

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.7 HOLDING TANKS

Holding tanks used to store wastewater will be sampled one per tank before demobilization from the site to determine if the tanks require additional cleaning.

4.7.1 Rationale

The holding tanks will be characterized to determine the effectiveness of decontamination before returning them to the vendor.

4.7.1.1 *Discrete/Composite Sampling Requirements*

A wipe sample shall be taken in order to characterize the tank walls.

4.7.1.2 Sample Collection and Field Testing

Wipe samples from the holding tanks will be collected and sent to an off-site laboratory for analysis. Wipe samples will be analyzed for TAL Metals using EPA Method 3050A/6010B.

4.7.1.3 Background, QA/QC, and Blank Samples and Frequency

Background and QA/QC samples will not be collected for holding tank sampling.

4.7.2 Procedures

This section outlines specific procedures that will be used when collecting wipe samples.

4.7.2.1 Sampling Methods

- The appropriate sample containers will be acquired precleaned from the laboratory. A wipe and the appropriate solvent (deionized water) will be placed in the sample container prior to sampling.
- Wipe samples will be obtained from the locations specified in Table 4-1.
- Wipe samples collected for metals analyses will typically consist of a composite of four discrete samples taken on four separate wipe pads for each pertinent suite of analytes. The additional wipe pads will be placed in a separate sample bottle for each analysis.
- Each discrete wipe pad will cover a 100-cm^2 per area (per suite of analytes). A 10-cm by 10-cm cardboard template will be placed over the selected area. The wipe pad will be removed from the laboratory bottle and the 10-cm by 10-cm area will be wiped in a horizontal direction. Without allowing the wipe pad to contact any other surface, the pad should be folded with the exposed side in, and then folded again to form a 90-degree angle in the center of the pad. The same 10-cm by 10-cm area should be wiped in a vertical direction. In the case of composite sampling, this procedure is to be repeated in three other areas and the four pads are to be resealed in the sample container for shipment to the appropriate laboratory.
- For MS/MSD samples, three times the number of wipes are required. For example, for an MS/MSD composite sample to be analyzed for metals, 12 wipes would be required (3 wipes at each sample node). A wipe from each node will be composited for the field sample, MS sample, and MSD sample. The wipes for these samples will be placed in three separate sample containers.

- If a wipe pad is found to be dry prior to use, it must be re-wet with deionized water in the field. Deionized water should be added to the wipe pad only to wet it; no excess is needed.

- Each sample should be collected quickly enough to ensure that all the deionized water does not evaporate from the pad prior to sealing the pad in the sample collection jar.

- The wipe procedure is the same for discrete wipe samples that are not part of the composite sample except that only one area will be wiped using only one pad.

- Where multiple wipe pads analyses are required at a single location, wipes will be taken adjacent to one another in as close proximity as is physically possible without causing cross contamination.

- During wipe sampling, care will be taken to avoid prolonged contact between the wipe pad and the sampler's hands. Wipe pads will be held carefully by one corner (or along the edge if the pads are circular) to avoid depositing a portion of the wipe sample on the sampler's glove.

- Clean, new templates will be used at each wipe location.

4.7.2.2 Field Measurement Procedures and Criteria

No field measurement procedures will be used. All analytical testing will be performed by an off-site laboratory.

4.7.2.3 Sampling for Chemical Analysis

Holding tanks will be sampled at the rate of 1 sample per tank.

4.7.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.7.2.5 *Field Quality Control Procedures*

No equipment blank sample is to be collected during holding tank sampling.

4.7.2.6 *Decontamination Procedures*

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.8 TREATED EFFLUENT CLASS C DISCHARGE CRITERIA

Wastewater will be generated from dewatering, stormwater control, and decontamination activities. This water will require treatment prior to discharge in accordance with the SPDES permit.

4.8.1 Rationale

Wastewater resulting from all site operations, including excavation groundwater and storm water, decontamination water, and spent washwater, etc. will be sampled following treatment to ensure proper treatment and compliance with NYSDEC discharge permit requirements. WESTON will submit the results NYSDEC for review as necessary.

4.8.1.1 *Discrete/Composite Sampling Requirements*

Samples of wastewater shall be collected as necessary to ensure proper treatment and discharge of the wastewater.

4.8.1.2 *Sample Collection and Field Testing*

Each wastewater characterization sample will be analyzed for TAL Metals (EPA Method 3010A/6010B); Pesticides (EPA Method 3550/8081A); VOCs (EPA Method 5030A/8260B); and SVOCs (EPA Method 3520B/8270C). Additional sampling parameters may be established as a result of the NYSDEC substantial equivalent SPDES permit criteria requirements. WESTON assumes that the 25 samples of treated wastewater to be collected, as defined in the SOW, will be collected on a regular basis (e.g., weekly) throughout the operation of the wastewater treatment plant. See Appendix G of the Work Plan for the NYSDEC permit discharge requirements which include sample parameters and frequency.

4.8.1.3 Background, QA/QC, and Blank Samples and Frequency

Background and QA/QC samples will be collected in accordance with Sampling Summary Table 4-2.

4.8.2 Procedures

This section outlines the specific procedures that will be used when collecting samples from the wastewater.

4.8.2.1 Sampling Methods

Samples will be manually collected in glass and plastic sample containers from the discharge effluent.

4.8.2.2 Field Measurement Procedures and Criteria

Field measurement procedures will not be used to determine contaminant concentrations in the wastewater. All analytical will be performed by an off-site laboratory.

4.8.2.3 Sampling for Chemical Analysis

Sampling will be conducted as needed in collection area to maintain compliance with permit requirements. WESTON anticipates weekly sampling.

4.8.2.4 *Sample Containers and Preservation Techniques*

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.8.2.5 *Field Quality Control Procedures*

Equipment blanks will not be collected. WESTON anticipates direct sampling into sample containers

4.8.2.6 *Decontamination Procedures*

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.9 PAD AND BERM CONFIRMATORY SAMPLES

Confirmation soil samples will be collected from the excavation sidewalls and floors upon completion of excavation and UXO screening in Areas A through J and the Low Lying Hill. No confirmation sediment samples will be collected for the creek bed excavations.

4.9.1 Rationale

Confirmatory soil samples will be used as the basis of determining further excavation in the OB Grounds. The actual volume of soil requiring excavation and UXO screening will vary based on the results from the initial confirmatory soil samples that are collected from the floors and bottoms of the excavation areas. Results will be compared to the 500 mg/kg cleanup criteria and any areas that exceed will be iteratively excavated and sampled until all results from the sidewalls and floors fall below the cleanup criteria.

4.9.1.1 Discrete/Composite Sampling Requirements

All confirmation samples will be taken as discrete samples.

4.9.1.2 Sample Collection and Field Testing

Soil samples from the excavation sidewalls and floor will be collected and sent to an off-site laboratory for analysis. Confirmation samples will be analyzed for total lead using EPA Method 3050/6010A.

4.9.1.3 Background, QA/QC, and Blank Samples and Frequency

Data from the RI/FS and USEPA guidance has been used to establish cleanup goals for the OB Grounds at SEDA. No background samples are necessary.

QA/QC samples will be collected at the frequency identified in Section 3.2.

4.9.2 Procedures

This section outlines specific procedures that will be used when collecting confirmation samples.

4.9.2.1 Sampling Methods

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades.

4.9.2.2 Field Measurement Procedures and Criteria

No field measurement procedures will be used to determine lead concentrations in the soil. All analytical testing will be performed by an off-site laboratory.

4.9.2.3 Sampling for Chemical Analysis

Once initial excavation in each area is complete, measurements of the sidewall will be made at ground surface and soil confirmation samples will be collected from the sidewall and floor areas.

One discrete sample will be collected for every 200 linear ft of excavation sidewall or at minimum 1 sample per sidewall. Sidewall confirmation samples will be collected at a depth approximately halfway between the ground surface and the excavation floor. In cases where one excavation was performed to multiple depths, the sidewall sample will be collected midway on the sidewall created between the two portions of the excavation. Samples will be laterally positioned in the center of the excavation sidewall or at the designated intervals.

One discrete soil sample from the excavation floor will be collected for every 2,500 square feet (sf) of floor area. At minimum, one sample will be collected from each excavation floor. Samples will be positioned roughly in the center of the 2,500 sf floor area as determined by measurements of the sidewall(s).

Prior to collecting confirmation samples, the sample location will be identified and marked. A decontaminated spade or sampling scoop will be used to remove any slough from the sample location so that a representative sample can be collected. Once the material has been cleared, the soil will be collected and placed into clean and labeled sample containers. In sampling locations where duplicate, MS/MSD, and QA samples will be collected, the soil will be collected into a clean mixing container, mixed, and then placed into the sample containers. Photographs and/or measurements to the sample locations will be taken as necessary.

Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.9.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.9.2.5 Field Quality Control Procedures

At least one equipment blank will be collected for every 20 soil samples or one per week for weeks that confirmation samples are being collected. This sample will be used to assess whether the sampling equipment or sample containers introduce contamination. The sample will also be used to perform QC checks on the equipment decontamination procedures.

To collect the equipment blank, reagent grade deionized water will be poured over the decontaminated sampling equipment into a 1 L HDPE container containing HNO^3 preservative. The sample containers will then be capped and chilled at 4°C until analysis.

4.9.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.10 CLEAN FILL

4.10.1 Rationale

Fill material, top soil, and organic fill for wetlands will be used from off-site sources for construction of the soil cover will be sampled to verify that the material is not contaminated.

4.10.1.1 Discrete/Composite Sampling Requirements

These samples will be collected as five-point composite samples from borrow pit stockpiles to obtain a representation of average concentrations.

4.10.1.2 Sample Collection and Field Testing

Each borrow pit characterization sample will be analyzed for the following:

- TAL Metals (3050B/6010B)
- Explosives (8330)
- TCL Organics (VOCs and SVOCs, 5030A/8260B and 3541B/8270C)
- PCBs (3545C 8082)/Pesticides (3545C/8081A).

4.10.1.3 Background, QA/QC, and Blank Samples and Frequency

Duplicate, MS/MSD, and QA samples will be collected at the frequency specified in Section 3.2.

4.10.2 Procedures

This section outlines specific procedures that will be used when collecting fill and top soil samples.

4.10.2.1 Sampling Methods

Samples will be manually collected using either decontaminated stainless steel or disposable scoops or spades. A decontaminated stainless steel bowl (or equivalent) will be used for sample homogenization.

4.10.2.2 Field Measurement Procedures and Criteria

Field measurement procedures will not be used to determine contaminant concentrations in the fill and top soil. All analytical will be performed by an off-site laboratory.

4.10.2.3 Sampling for Chemical Analysis

The five discrete sample points that make up the composite stockpile sample will be selected in such a manner that they are representative of the material in the entire batch. At each of the five discrete locations, the scoop will be used to dig into the soil batch. Soil samples will be manually collected from the pre-dug locations using either decontaminated stainless steel or disposable scoops or spades. Equal portions of material from each discrete location will be placed into a decontaminated stainless steel bowl and homogenized. The material from the mixing bowl will be transferred into the appropriate sample containers. Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.10.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan (QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.10.2.5 Field Quality Control Procedures

One equipment blank will be collected for each borrow source sampled. This sample will be used to assess whether the sampling equipment or sample containers introduce contamination. The sample will also be used to perform QC checks on the equipment decontamination procedures.

To collect the equipment blank, reagent grade deionized water will be poured over the decontaminated sampling equipment into a 1 L HDPE container containing HNO^3 preservative. The sample containers will then be capped and chilled at 4°C until analysis.

4.10.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

4.11 PERSONNEL AIR SAMPLES

4.11.1 Rationale

Air sampling will be conducted during site activities for health and safety purposes. Real-time air monitoring using direct reading instruments is discussed in Subsection 4.4.1 of the Site Specific Health and Safety Plan (SSHASP). Personnel air sampling, discussed in Subsection 4.4.2 of the SSHASP and in the following paragraphs. will be used to quantify the potential for on-site worker exposure to lead.

4.11.1.1 Discrete/Composite Sampling Requirements

A specified air volume will be continuously collected throughout the work day to obtain a time-weighted average (TWA) for the sampling period.

4.11.1.2 Sample Collection and Field Testing

Air Sampling will be performed in accordance with the NIOSH Sampling and Analytical Method 7300 (see Attachment 1) and analyzed for total lead. Air samples will be analyzed off-site at an accredited American Industrial Hygiene Association (AIHA) laboratory.

Samples will be collected from one individual each day of the first three days of intrusive activities. Thereafter, if airborne exposure limits are less than ½ the PEL as anticipated, sampling will be conducted once per week until a consensus is reached that sampling is no longer needed. Sampling will be resumed if air monitoring as described in the SSHASP indicates consistent levels of dust above the Action Level.

4.11.1.3 Background, QA/QC, and Blank Samples and Frequency

One field blank sample will be collected for each sampling event and submitted with the other samples for analysis. Background, duplicate, MS/MSD, and QA samples will not be collected. The laboratory quality control procedures described in NIOSH Method 7300 will be followed.

4.11.2 Procedures

This section outlines specific procedures that will be used when collecting personnel air samples.

4.11.2.1 Sampling Methods

The sample will be collected by a personnel sampling pump attached to a sampler. Personnel air sampling pumps capable of sustaining the 2.0 liter per minute (lpm) flow rate required for eight hours will be used to collect the samples.

4.11.2.2 Field Measurement Procedures and Criteria

Field measurement procedures will not be used to determine lead concentrations in the air. All analytical will be performed by an off-site laboratory. However, field measurements of dust levels will indicate the necessity for continued personnel air sampling.

4.11.2.3 Sampling for Chemical Analysis

NIOSH Method 7300 will be used to sample and analyze for lead. In Method 7300, air is drawn through a Mixed Cellulose Ester Filter (SKC Part number 225-03-01 or equivalent) at a rate of 2.0 lpm. Sampling periods will be a minimum of 7.5 hours. After four hours of sampling, filters will be examined and if notable loading is seen a new filter will be used to complete the sampling. This will result in splitting the sampling period. The results of the two filters will be combined to calculate the TWA. The sample will be analyzed by inductively coupled argon plasma. atomic emission spectroscopy (or equivalent) in accordance with NIOSH Method 7300.

Samples will be taken from the field and chilled at 4°C in an on-site refrigerator or placed directly into the coolers for shipment.

4.11.2.4 Sample Containers and Preservation Techniques

Specific sample containers and preservations will be performed according to Appendix I of USACE Guidance Document EM 200-1-3. Table 6-1 in the Quality Assurance Project Plan

(QAPP) describes the required sample containers and preservation techniques for the analyses to be performed during this project.

4.11.2.5 Field Quality Control Procedures

Air sampling pumps and a representative filter train will be calibrated prior to and following sampling. A bios Dry Cal calibrator or equivalent will be used for pump calibrations. A minimum of three trials within 10% of each other will be required for a valid calibration. Both pre-/post-calibrations along with employee information, will be recorded on a data sheet

4.11.2.6 Decontamination Procedures

The decontamination method for sampling equipment is defined in EM 200-1-3, these procedures are summarized in Table 4-1. Following decontamination, sampling equipment will be placed into plastic bags or wrapped in foil to avoid re-contamination during storage. Metals will be the contaminants of concern during the confirmation sampling.

SECTION 5

SAMPLE CHAIN OF CUSTODY/DOCUMENTATION

5. SAMPLE CHAIN OF CUSTODY/DOCUMENTATION

This section documents chain-of-custody and documentation procedures. Samples will be collected by personnel who have documented experience collecting hazardous waste samples.

5.1 FIELD LOGBOOK

The field logbook should enable the sampling activity to be reconstructed without relying on the collector's memory. Logbooks should be kept in the possession of the field member responsible for sampling activities, or in a secure place during fieldwork. The following information should be recorded in the field logbook:

- Name and title of author, and date and time of entry.
- Name and address of field contact.
- Names and responsibilities of field crew members.
- Names and titles of any site visitors.
- Sample collection method.
- Number and volume of sample(s) taken.
- Information concerning sampling changes, scheduling modifications, and change orders.
- Details of sampling location.
- Date and time of collection.
- Weather conditions, including temperature.
- Field observations.
- Any field measurements made.
- Sample identification number(s).
- Information from containers, labels of reagents used, deionized water used for blanks, etc.

- Sampling methodology.
- Analytical method to be performed.
- Sample documentation (e.g., chain-of-custody record numbers).
- Decontamination procedures.
- Documentation for investigation-derived wastes (IDWs) (e.g., contents and approximates volume of waste, disposal method).
- Signature and date (entered by personnel responsible for observations).

5.2 PHOTOGRAPHS

Photographs will be taken as necessary to document field activities, as allowed by SEDA.

5.3 SAMPLE NUMBERING PROCEDURES

All samples will be collected for the duration of this project will be uniquely identified using the following scheme:

AA-BBBB-CCC-D

The codes A through D are as defined as below:

AA: **Type of Sample:**

SP: Stockpile Characterization
CG: Confirmation Grid/Perimeter
CE: Confirmation Samples for Excavations
WW: Wastewater
FB: Clean Fill/Borrow Material
A: Air
D: Debris/PPE/Liner/Haul Road/Staging Area

BBBB: **Area of Sample Origin:**

For Stockpile Characterization (SP):

BT: Bench test
SD: Sediment
SS: Stabilized soils

S1, S2.S3: Case 1, Case 2, Case 3 soils

For Confirmation Grid/Perimeter (CG):

G: Grid sample
P: Perimeter sample

For Confirmation Samples for Excavation (CE):

Examples:	A1B:	Pad A Case 1, berm
	J2P:	Pad J Case 2, pad

For Wastewater (WW):

(will be determined in field)

For Clean Fill/Borrow Material (FB):

BP1, BP2....: Borrow Pit 1, Borrow Pit 2,...

For Air (A):

SP:	Stockpile characterization sampling/management
CE:	Excavation confirmation sampling/surveying
WW:	Wastewater treatment plant operation
MW:	Monitoring well installation
SD:	Creek bed sediment excavation/sampling
SS:	Solidification/stabilization operation

For Miscellaneous Debris (D):

PPE:	Personnel protective equipment
BL:	Bulk liner
SA:	Staging area soil
HR:	Haul road soil
T01, T02:	Holding tank 01, Holding tank 02,

CCC: **Sample Number** (001, 002...):

These sample numbers will be used sequentially and not repeated.

D: **Subsample Number:**

Initial:	0	QA:	2
Duplicate:	1	Field/Eqpt. Blank:	3

Examples:

SP-00SD-002-0

Stockpile Characterization Sediment Sample No. 2, initial sample.

0A-00WW-001-1

Air Sample No. 1 from Wastewater treatment plant operation, duplicate sample.

Trip Blanks: TBK-[Date]-[sample number]

The system for identifying and tracking the samples, associated field data, and the method of relating the data to the proper samples will be recorded in permanently bound and weatherproof notebooks and also in computer spread sheet format maintained by the field team. Team members will record all information related to sampling procedures, time, field and weather conditions, unusual events, sample descriptions (including sample depth), instrument readings, and chain-of-custody data. Field documentation will be performed in indelible ink.

Additional sample types, areas of origin, and subsample types will be allocated as necessary.

5.4 SAMPLE DOCUMENTATION

5.4.1 Sample Labels

Sample labels and/or tags will be consistent with the requirements of Appendix F of EM 200-1-3 (see Attachment 3).

Field personnel will be responsible for identifying, labeling, providing proper preservation, and packaging samples to prevent breakage during shipment.

Each sample will be labeled with the following information:

- Project number and site name.
- Unique sample number.
- Sampling date and time.
- Initials of sampling technician.
- Method of sample preservation/conditioning.

- Analytical method to be performed.

5.4.2 Sample Field Sheets and/or Logbook

The system for identifying and tracking the samples and associated field data will be recorded on both a computer generated spreadsheet and a permanently bound and weatherproof logbook maintained by the field team. Team members will record all information related to sampling procedures as specified in Subsection 5.1. Field documentation will be written in indelible ink.

5.4.3 Chain-of-Custody Records

Chain-of-custody records provide documentation of the handling of each sample from the time of its collection to its destruction. WESTON will initiate sample custody upon collection of samples. Chain-of-custody forms will be placed in weatherproof plastic bags and taped to the inside lid of the cooler. The cooler will be sealed with chain-of-custody seals. Chain-of-custody forms will be used for recording pertinent information about the types and numbers of samples collected and shipped for analysis. Sample identification numbers will be included on the chain-of-custody form to ensure that no error in identification is made during shipment. Chain-of-custody procedures shall be performed in accordance with Appendix F of EM 200-1-3.

A sample is considered “in custody” if it:

- Is in a person’s actual possession
- Is in view after being in physical possession
- Is locked up so that no one can tamper with it after having been in physical custody
- Is in a secured area, restricted to authorized personnel only

A sample chain-of-custody for is provided in Attachment 3.

5.5 DOCUMENTATION PROCEDURES

Prior to sample collection, labels will be affixed to sample containers using either transparent tape or self-adhesive labels. Indelible ink will be used for all logbooks, chain-of-custody, and sample label entries. Documentation will conform to Appendix F of EM 200-1-3 (Attachment 3).

5.6 CORRECTIONS TO DOCUMENTATION

All original data recorded in field logbooks, sample labels, chain-of-custody records, and receipt for sample forms will be written in indelible ink. If an error is made, a single line should be drawn through the entry and the entry initialed and dated. The erroneous information should not be obliterated. The person who wrote the entry should correct any errors found in documentation.

SECTION 6

SAMPLE SHIPMENT

6. SAMPLE SHIPMENT

Samples will be placed in containers compatible with the intended analysis and properly preserved prior to shipment to the laboratory. Each sealed container will be placed in a leak-proof plastic bag. Strong thermal ice chests will be filled approximately 3 inches with inert material, such as vermiculite. The bagged sample containers will be placed in the ice chests surrounded by ice, and vermiculite will be added to nearly fill the ice chest. A chain-of-custody form will be placed in a waterproof plastic bag and taped to the inside lid of the cooler. Ice chests will be taped shut with strapping tape, wrapped around the cooler in at least two places. Ice chests will be sealed with numbered and signed chain-of-custody seals. This packaging and shipment is in accordance with EPA protocol. Prior to shipment, a QC check will be performed to ensure samples have been properly identified and packaged, and that appropriate documentation (chain-of-custody) will accompany them.

SECTION 7

INVESTIGATION-DERIVED WASTES (IDW)

7. INVESTIGATION-DERIVED WASTES (IDW)

Waste materials generated during site activities (e.g., PPE, decontamination fluids, and drill cuttings) will be containerized and sampled to determine disposal options.

Potentially hazardous materials generated during field activities will be placed in labeled drums, portable tanks, and roll-off containers. Representative samples will be obtained for all waste streams. Containerized IDW that is determined to be non-hazardous based on analytical results will be disposed of as solid waste. IDW characterized or listed as hazardous waste will be disposed of in a manner consistent with all local, state, and federal guidelines. It is expected that the standing water from the excavation areas will be treated on-site and discharged.

SECTION 8

CONTRACTOR CHEMICAL QUALITY CONTROL (CCQC)

8. CONTRACTOR CHEMICAL QUALITY CONTROL (CCQC)

WESTON is required to ensure that quality is maintained throughout all fieldwork. WESTON will utilize experienced field personnel to perform soil and ground water sampling, air, solid, liquid, and wipe sampling.

8.1 INSPECTION REVIEW PROCEDURES

The Site QC Officer will review all pertinent sections of the plans and specifications prior to the start of a new task to ensure that field personnel are cognizant of DQOs. The Site Manager, in conjunction with the WESTON Project Manager and sampling team, will also review all work requirements, examine all materials and equipment, examine work areas, and demonstrate all field activities daily or as required. If new sampling personnel arrive on-site during the work effort, the Site QC Officer must repeat this process before new personnel begin work. The QC Officer will at a minimum perform an initial check to ensure that all procedures are followed.

8.1.1 Project-Specific Checklist

The field equipment list includes the following:

- Sampling and Analysis Plan (SAP).
- Example tables for recording all data.
- QA sample table for matching QC and QA samples.
- Field screening instruments.
- Calibration standards.
- Instrument operating manuals.
- Backup instrument(s) for field screening.
- Decontamination materials.
- Personal protective equipment (PPE).
- Sample collection equipment.
- Labels for sample containers.
- Examples of completed sample shipping documents.
- Sample containers.
- Chain-of-custody forms.
- Chain-of-custody seals.
- Sample shipping coolers.

- Sample packing materials.
- Ice packs.
- Sample preservatives.
- Laboratory information.
- Copy of a phone log showing that QA samples have been scheduled.

Checklist of activities:

- Review DQOs and specific analytical method, including required sampling, sample holding, and analysis requirements.
- Review sampling and analysis plan.
- Calibrate all instruments.
- Review decontamination procedures.
- Review sample custody forms.
- Review sample numbering system.
- Discuss analytical test methods.
- Review sampling techniques.

The Site QC Officer or designee is responsible for overseeing each step of work when it is initiated.

Checklist of activities:

- Review sampling activities for compliance with this SAP.
- Review sample labels and chain-of-custody forms for accuracy, completeness, and consistency.
- Oversee sample packaging and shipping.
- Verify and document instrument calibrations.
- Inspect field notes.

The Site QC Officer or designee is responsible for continued daily contract compliance throughout completion the project.

SECTION 9

DAILY CHEMICAL QUALITY CONTROL REPORTS (DCQCRS)

9. DAILY CHEMICAL QUALITY CONTROL REPORTS (DCQCRS)

9.1 DAILY QUALITY CONTROL REPORTS

9.1.1 Field Activities

DCQCRs will be incorporated into the daily inspection and daily construction quality control reports. These reports will be completed and submitted to CENAE as required.

9.1.2 Laboratory

The QC reporting requirements for laboratory reporting are addressed in Sections 11 and 14 of the QAPP. The QC information will be submitted together with the analytical data packages. No additional QC reports will be required.

9.2 DEPARTURE FROM APPROVED PLANS

WESTON will document and report all major departures from approved plans. The report will address the following:

- Reasons for departures.
- Problems identified.
- Corrective actions.
- Effect of the departure on scope and results.
- Instructions from CENAE personnel for resampling and/or reanalysis.

These reports of major departures from approved plans will be sent to the contracting officer's representative within 48 hours of the occurrence.

9.3 DATA REPORT TO THE QUALITY ASSURANCE LABORATORY

The data will include a table that matches primary (field, QC) samples with their corresponding QA samples. An example of this table from guidance document EM 200-1-3 is included in

Attachment 4. The data reporting will also include a discussion of any problems that occurred during analyses. the effects of those problems, and recommendations for further analyses, if required.

SECTION 10

CORRECTIVE ACTIONS

10. CORRECTIVE ACTIONS

10.1 FIELD CORRECTIVE ACTION

Field personnel have initial responsibility for monitoring the quality of field measurements and observations. The Site Manager will notify the Site QC Officer and QC Management of any problems that occur that may jeopardize the integrity of the project or cause any project objective to not be met. An appropriate corrective action will be developed and implemented. The project engineer will document the problem, including the cause, the corrective action, and results in the field logbook. Copies of the logbook will be provided to the Project Manager, Site QC Officer, and QC Manager.

10.2 LABORATORY CORRECTIVE ACTION

The analyst has initial responsibility to monitor the quality of an analytical system. The analyst will verify that all laboratory-specific QC procedures are followed and results of an analysis of QC samples are within acceptance criteria. This requires that the analyst assess the correctness of all of the following items as appropriate:

- Sample preparation procedure.
- Initial calibration.
- Calibration verification.
- Method blank result.
- Laboratory control standard.
- Duplicate analysis.
- Fortified sample result.
- MS/MSD and surrogate recoveries.

If the assessment reveals that any of the laboratory-specific QC acceptance criteria are not met, the analyst must immediately assess the analytical system to correct the problem. The analyst notifies the appropriate supervisor and laboratory QA coordinator of the problem and, if possible, identifies potential causes and corrective action.

The nature of the corrective action depends on the nature of the problem. For example, if continuing calibration verification is determined to be "out of control," the corrective action may require recalibration of the analytical system and reanalysis of all samples since the last acceptable continuing calibration standard.

When the appropriate corrective action measures have been defined and the analytical system is determined to be "in control," the analyst documents the problem and the corrective action. Data generated concurrently with an "out-of-control" system will be evaluated for usability in light of the nature of the deficiency. If the deficiency does not impair the usability of the results, data will be reported and the deficiency noted in the case narrative. Where sample results are impaired, the laboratory QA coordinator is notified and appropriate corrective action (e.g., reanalysis, etc.) is taken. If reanalysis cannot be conducted, re-sampling may be required. Other laboratory corrective actions are discussed in section 10 of the QAPP.

SECTION 11

SAMPLING APPARATUS AND FIELD INSTRUMENTATION

11. SAMPLING APPARATUS AND FIELD INSTRUMENTATION

A list of the expected field equipment, containers, and supplies anticipated for this project is provided below. Not all equipment may be used.

Field Equipment:

- First aid kit
- Eyewash station
- Caution tape
- Hazard signs
- Camera
- Combustible gas indicator
- Duct tape
- Extension cord
- Flame ionization detector
- Film
- Fire extinguisher
- Garbage bags
- Generator
- Indelible ink
- MiniRam
- Paper towels
- Razor knife
- Sample containers provided by laboratory
- Polyethylene sheeting

Decontamination Equipment:

- Liquinox
- Hexane
- Methanol
- Nitric Acid
- Deionized water
- Decon tubs
- Spray bottles
- Squeeze bottles
- Plastic sheeting
- DOT drums
- Scrub brushes

Personal Protective Equipment:

- Safety goggles
- Surgical gloves
- Nitrile gloves
- Plastic booties
- Tyvek suits
- Level C protective gear
- Level D (and Level D modified) protective gear

Sampling Equipment:

- Stainless steel bowls
- Vermiculite
- Spades
- Scoopulas
- Tape measures
- Templates for wipe sampling
- Open tube drum thieves for drum/tank sampling
- Folding ruler
- Hazard shipping labels
- Cooler
- Strapping tape
- Shovel
- Ice
- Measuring wheel
- Site plans
- Weatherproof notebook
- Sample log forms
- Sample containers, including wipe pads and labels
- Chisel

SECTION 12

REFERENCES

12. REFERENCES

EPA (U.S. Environmental Protection Agency). 1986. *Test Methods for Evaluating Solid Wastes*, Public. No. SW-846, November 1986, revised December 1987 and December 1988, and all other updates.

USACE (U.S. Army Corps of Engineers). 1996. *Engineering and Design, Chemical Data Quality Management for Hazardous Waste Remedial Activities*, ER-1110-1-263.

USACE (U.S. Army Corps of Engineers). 1994. *USACE Requirements for the Preparation of Sampling and Analysis Plans*, EM-200-1-3.

Parsons Engineering Science, Inc. 1998. *Plans and Specifications for the Remediation Project at SEAD 23 – Open Burning Grounds, Seneca Army Depot Activity, Romulus, New York.*

ATTACHMENT 1

INSTRUCTION E-5 OF EM 200-1-3

apparatus. Solvent rinsates from the sample container are also added to the extraction apparatus. Tap water is subsequently poured into the sample container to measure the initial sample volume. If only a portion of the sample is needed, the required sub-sample should be measured using a clean pipet, syringe, or comparable measuring device. Samples should not be collected directly from the sample container except for volatile organic analysis. Sub-samples for volatile organics analysis should be obtained directly from the sample container by piercing the septa of the container using a clean syringe.

c. Potential problems. Sub-sampling the lower phases of a multi-phase liquid may pose special problems. A pipet or syringe needle passing through the lighter layers may pick up contaminants that can bias analytical results. The pipet tip or syringe needle should be wiped clean before transferring lower phase sub-sample to a preparation flask. Removal of the lighter layer(s) prior to sub-sampling may be required to obtain a representative aliquot. Clay soil samples may be difficult to sub-sample with a coring type device. Some hand coring samplers are equipped with clear plastic liner tubes that make extracting the sub-sample from the corer much easier. However, the goal is to obtain a representative sample. In these situations, professional judgement is required and a clean stainless steel spatula may be the tool of choice.

E-5. Decontamination Procedures/Sample Contaminant Sources

a. Scope and application. The purpose of this section is to provide instruction on deciding an appropriate decontamination scheme(s) for the project field sampling equipment in order to prevent or reduce cross-contamination of project samples. The applicability of each step in a decontamination protocol will depend upon the contaminants present onsite, the subsequent analysis to be performed, the composition of the sampling devices, etc. The appropriateness of a decontamination protocol is vital to the eventual validity of the analytical results and decisions made based upon those results. All sampling equipment that has come in contact with a potentially contaminated media must be cleaned prior to the subsequent use of that device. Devices may include bailers, pumps, shovels, scoops, split spoons, tube samplers, augers, etc. Another approach to minimizing the potential for cross-contamination may be to dedicate or use disposable sampling equipment.

b. Decontamination procedures. Refer to the following table for various step-wise decontamination protocols.

(1) Reagents. The detergent wash is a non-phosphate detergent solution used with brushing or circulating techniques to remove gross contamination, and/or as a mild neutralizing agent. Tap water is considered a rinse water, preferably from a water system of known chemical composition. Acid rinses are used as the inorganic solubilizing agent, or as a mild neutralizing agent. These rinses are a 10-percent to 1-percent HCl or HNO_3 solution prepared from reagent grade acids and deionized water, respectively. Solvent rinses are used as an organic solubilizing agent. Requirements for solvent types vary depending upon the nature of known organic contamination requiring solubilization; and any impurities present within the rinse which may potentially interfere or contribute to the subsequent analysis. All solvent rinses used must be of pesticide grade quality. Finally, the deionized water is organic-free reagent water.

(2) Procedure clarifications/exceptions. Refer to Table E-1 for the general necessary procedures based upon site contaminants and/or subsequent analytical protocols. As noted above, the detergent wash is used in conjunction with scrubbing for gross contamination removal, followed by the appropriate rinses. For cleaning of pumping equipment or devices with inaccessible internal mechanisms, suggest circulating/flushing the system with the applicable solutions in the order given below. Solvent rinses for pumping equipment should be limited to a 10-percent dilution (vol./vol.) of acetone or isopropyl alcohol in water. Tubing used with peristaltic pumps may be flushed with hexane or dilute HCl, followed by a distilled water rinse depending on contaminants noted onsite. The decontamination of low carbon steel sampling devices should limit the acid rinse to a dilute 1-percent acid solution. All sampling equipment should be allowed to dry prior to the next use. For this reason it is important to have sufficient sampling devices onsite which may be alternated. This practice will allow a thorough drying of equipment without increasing sampling downtime. Alternatively, larger equipment (e.g., drill rig components, power augers, etc.) may be cleaned with a portable power washer or a steam cleaning machine in lieu of the protocols outlined below. Finally, depending upon the project, it may be appropriate to contain spent decontamination fluids and arrange for eventual disposal as investigation-derived wastes (IDW). Refer to U.S. Army Corps of Engineers guidance on IDW for further information on this subject. In these cases, it is important that these

Table E-1
Procedure Clarifications/Exceptions

	Detergent Wash	Tap Water	Acid Rinse	Tap Water	Solvent Rinse[1]	Deionize Water	Air Dry
VOA Low MW CMPDS[2]	✓	✓			Methanol	✓	✓
BNA PEST/ PCBS High MW CMPDS[2]	✓	✓			Hexane	✓	✓
Organic Bases [3]	✓	✓	(dil.acid) 1% Sol.	✓	Iso-propyl Alcohol	✓	✓
Organic Acids [4]	(dil.base) ✓	✓			Iso-propyl Alcohol	✓	✓
Trace Metals	✓	✓	10% Sol.	✓		✓	✓
Salts	✓	✓				✓	✓
Acidic CMPDS	(dil.base) ✓	✓				✓	✓
Basic CMPDS	✓	✓	(dil.acid) 1% Sol.	✓		✓	✓
caustic							

[1] Solvent rinses vary in polarity which leads to varying solubilizing properties. Deciding appropriate solvent rinses should first identify if a known or suspect contaminant requires removal from sampling equipment. Optimum solvents for contaminants are noted above. Secondly, it should be identified whether the subsequent analytical protocol would be impacted by an impurity of, or the solvent being used (e.g., residual acetone present in isopropyl alcohol would be measured with certain volatile organics analysis).
[2] MW CMPDS = molecular weight compounds
[3] Organic bases include Amines, Hydrazines.
[4] Organic acids include Phenols, Thiols, Nitro and Sulfonic compounds.

containers be suitable for the eventual disposition of the materials, and therefore comply with any potentially applicable U.S. Department of Transportation regulations.

c. Sample contaminant sources and other potential problems.

(1) Carryover and leaching. Contaminant carryover between samples, and/or from leaching of the sampling devices, is very complex and requires special attention. Decisions concerning the appropriateness of the device's material composition must account for these carryover or leaching potentials, and whether these contaminants are of concern on the project. Materials potentially encountered on projects and their associated common contaminants are listed in Table E-2.

Equipment blanks may be used to assess contamination of this nature, and are discussed in detail in Instruction H-2 in Appendix H.

(2) Adsorption. Contaminant adsorption is another problem which must be considered when deciding on an applicable sampling device or the appropriate composition material. This phenomenon is more critical when sampling an aqueous or gaseous media, due to the capability of lower levels of contaminant detection and the fact that the fluid matrix is more apt to potential contaminant

Table E-2
Materials Potentially Encountered on Projects

Material	Commonly Related Contaminants
Glass	Silicon Boron
Rigid polyvinyl chloride (PVC) (threaded joints)	Chloroform Vinyl chloride
Rigid PVC (cemented joints)	Methyl ethyl ketone Toluene Acetone Methylene chloride Benzene Tetrahydrofuran Ethyl acetate Cyclohexanone Vinyl chloride
PVC plastic tubing	Phthalate esters Vinyl chloride Low level (zinc, iron, antimony, and copper)
Soldered pipes	Lead Tin
Stainless steel	Chromium Iron Nickel Molybdenum
Brass	Copper Zinc Tin

transfer. PVC and other plastics are known to sorb organics and to leach plasticizers and phthalate esters. Polypropylene, and other thermoplastics, have been shown to sorb organics and environmental mercury efficiently, and should therefore be avoided in sampling devices, especially tubing. For these reasons, PTFE is commonly chosen over the PVC and plastics when working with organic or mercury contaminants. In addition, some pesticides and halogenated compounds preferentially adsorb to glass surfaces. For this reason, it is recommended that when taking aqueous samples, the sample container NOT be rinsed prior to sample collection; and the same container be rinsed with the extraction solvent after the sample has been quantitatively transferred to an extraction apparatus. Inorganics (metals) adsorption to containers is dependant upon the specific metal element, the concentration, pH, contact time, complexing agents present, and container composition. This is believed to be nominal and proper preservation of samples should prevent this. In deciding appropriate tubing to be used for aqueous sample acquisition, it is important to decide applicable material composition and diameter based upon the contaminant and the purpose of the data. Adsorption is less likely to occur when there is an increase in tubing diameter.

ATTACHMENT 2

APPENDIX F OF EM 200-1-3

Appendix F
Sample Documentation and Shipment Instructions

F-1. Documentation

a. Scope and application. This section describes procedures for maintaining sample control through proper sample documentation. When samples are collected for chemical or physical characteristics analysis, documentation such as chain-of-custody and sample analysis request forms, custody seals, and logbooks needs to be completed. The information presented in this section enables maintenance of sample integrity from time of collection through transportation and storage. It is this documentation that will verify that the samples were properly handled.

b. Documentation. The following discussion outlines standard practices and procedures to be used when documenting a sampling episode. All project-specific documentation requirements must be presented in the sampling and analysis plan (SAP). This includes identification of procedures required for field documentation, sample labeling, and the maintenance of chain-of-custody. Applicable requirements are identified in the following paragraphs. In addition, the contractor is required to obtain a tracking number (e.g., Laboratory Information Management System (LIMS) number) from the U.S. Army Corps of Engineers (USACE) technical manager that is used in conjunction with the government quality assurance (QA) sample shipments. The tracking number should be specified in the SAP. Proper completion of the logbook and supporting paperwork with indelible ink is necessary to support potential enforcement actions that may result from the sample analysis. Therefore, maintaining sample integrity through proper documentation is essential.

(1) Field logbooks. Project field logbooks must be bound and should have numbered, water-resistant pages. All pertinent information regarding the site and sampling procedures must be documented in indelible ink. Notations should be made in logbook fashion, noting the time and date of all entries. Information recorded in this logbook should include, but not be limited to, the following:

(a) Name and exact location of site of investigation or interest.

(b) Date and time of arrival and departure.

(c) Affiliation of persons contacted.

(d) Name of person keeping log.

(e) Names of all persons on site.

(f) Purpose of visit.

(g) All available information on site (processes or products, waste generation, nature of spilled material) and the composition and concentration of substance, if known.

(h) Field instrument equipment used and purpose of use (i.e., health & safety screening, sample selection for laboratory analysis), calibration methods used, field results, and quality control (QC) information.

(i) Location of sampling points (including justification) [Note: It is recommended that a sketch of the general surroundings of the sampling area (site) be provided. Sample identification numbers should correspond directly with sample locations].

(j) Identification number, volume, sampling method, and containers (size/type) for each sample collected. Any sample manipulations such as filtration, compositing, and executed preservation techniques should also be documented.

(k) Date and time of sample and data collection and any factors that may affect their quality.

(l) Name of collector.

(m) All sample identification numbers and a description of samples--especially any related QC samples.

(n) Weather conditions on the day of sampling, and any additional pertinent field observations.

(o) Description of the number of shipping coolers packaged (attach associated chain-of-custody forms) and the shipping method employed (note applicable tracking numbers).

(p) Name and address of all receiving laboratories. For sample shipment to the government QA laboratory, note the associated project LIMS number.

(2) Documenting sampling points. The exact locations of sampling points should be documented for purposes of generating an accurate representation of the site conditions using the data generated to date, defining data gaps, and identifying potential future data needs. This is

accomplished through the use of a monument and compass. A monument should be chosen at each site to act as a stationary reference point from which all sampling points can be measured using a compass and measuring tape. If a building or other stationary structure exists, its corner may act as this reference point. If no monument exists, it will be necessary to create one. A piece of wood, approximately 2 in. by 2 in., should be hammered into the ground to almost ground level, making it difficult to remove and thus assuring its permanence. The stake should then be marked with flagging tape or fluorescent paint. When establishing a sampling point, the following procedure should be used:

(a) Standing at the monument, facing the sampling point, use the compass hairlines to determine the degree of direction.

(b) Ensure that the line of sight runs from the monument, through both hairline needles on the compass, to the sampling point.

(c) When first establishing the sampling point, record the degree and direction reading from the compass in the field logbook, along with the distance measurement from the monument to the sampling point.

(3) Photographic documentation. All sampling points should be documented on film. A film record of a sampling event allows positive identification of the sampling point. In some cases, a photograph of the actual sample collected may be required. Photographs are the most accurate and convenient record of field personnel observations. Photographs taken to document sampling points should include two or more reference points to facilitate relocating the point at a later date. Keeping a record of photographs taken is crucial to their validity as a representation of an existing situation. Photograph documentation is invaluable if the sampling and subsequent analytical data end in litigation, enforcement, or cost recovery actions. In addition to photographs, video coverage of a sampling episode can be equally or even more valuable than photographs because it can be used to prove that samples were taken properly as well as the location at which they were taken. Video coverage can be used as a record of site conditions and can give those who have not been onsite an idea of the circumstances. For each photograph taken, the following items should be noted in the field logbook:

(a) Date.

(b) Time.

(c) Photographer (signature).

(d) Name of site.

(e) General direction faced and description of the subject taken.

(f) Sequential number of the photograph and the roll number.

(g) Site photo map (see Figure F-1).

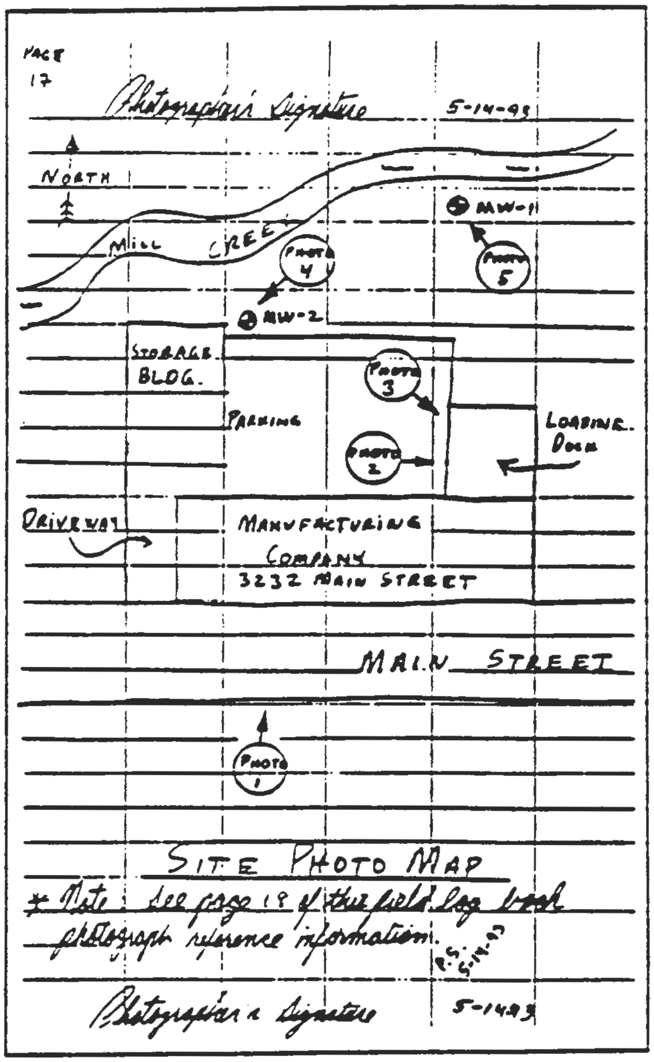


Figure F-1. Site photo map

(4) Sample collection paperwork.

(a) Sample labels. Sample labels are required for properly identifying samples and evidence. The data obtained from samples collected for a sampling or monitoring activity may be used for remedial measures. All samples must be properly labeled with the label affixed to the container prior to transportation to the laboratory. It is also recommended that samples be photographed so that labels are clearly readable for later identification. Information on sample labels should include, but not be limited to, the following:

- Project Code. An assigned contractor, project number, site name.
- Station Number. A unique identifier assigned to a sampling point by the sampling team.
- Sample Identification Number. Each sample, including field control samples, collected for a project should be assigned a unique number. This assigned number incorporates information on the sample type and date (see Section *b*(4)b in Instruction F-1).
- Samplers. Each sampler's name and signature or initials.
- Preservative. Whether a preservative is used and the type of preservative.
- Analysis. The type of analysis requested.
- Date/Time. Identify the date and time the sample was taken.
- Type of Sample. The type of sample should be identified as discrete or composite.

(b) Sample numbering. A sample numbering system should be used to identify each sample collected and submitted for analysis. The purpose of the numbering system is to assist in the tracking of samples and to facilitate retrieval of analytical results. The sample identification numbers for each sampling effort should be used on sample labels, sample tracking matrix forms, chain-of-custody forms, field logbooks, and all other applicable documentation. A listing of all sample identification numbers should be recorded in the field logbook. The sampling numbering system may vary depending upon the number and type of samples that will be collected at the site. An example of a sample numbering system is presented below. Location and sample identification numbers should consist of the following designations to identify the location (AABBB-CC), sample sequence number, date (MMDDYY), and sample interval for soils (00-00):

For Soil and Bedrock:	AABBB-CC/MMDDYY/00-00
For Water:	AABBB-CC/MMDDYY
For QC Samples:	AABBB-CC/MMDDYY

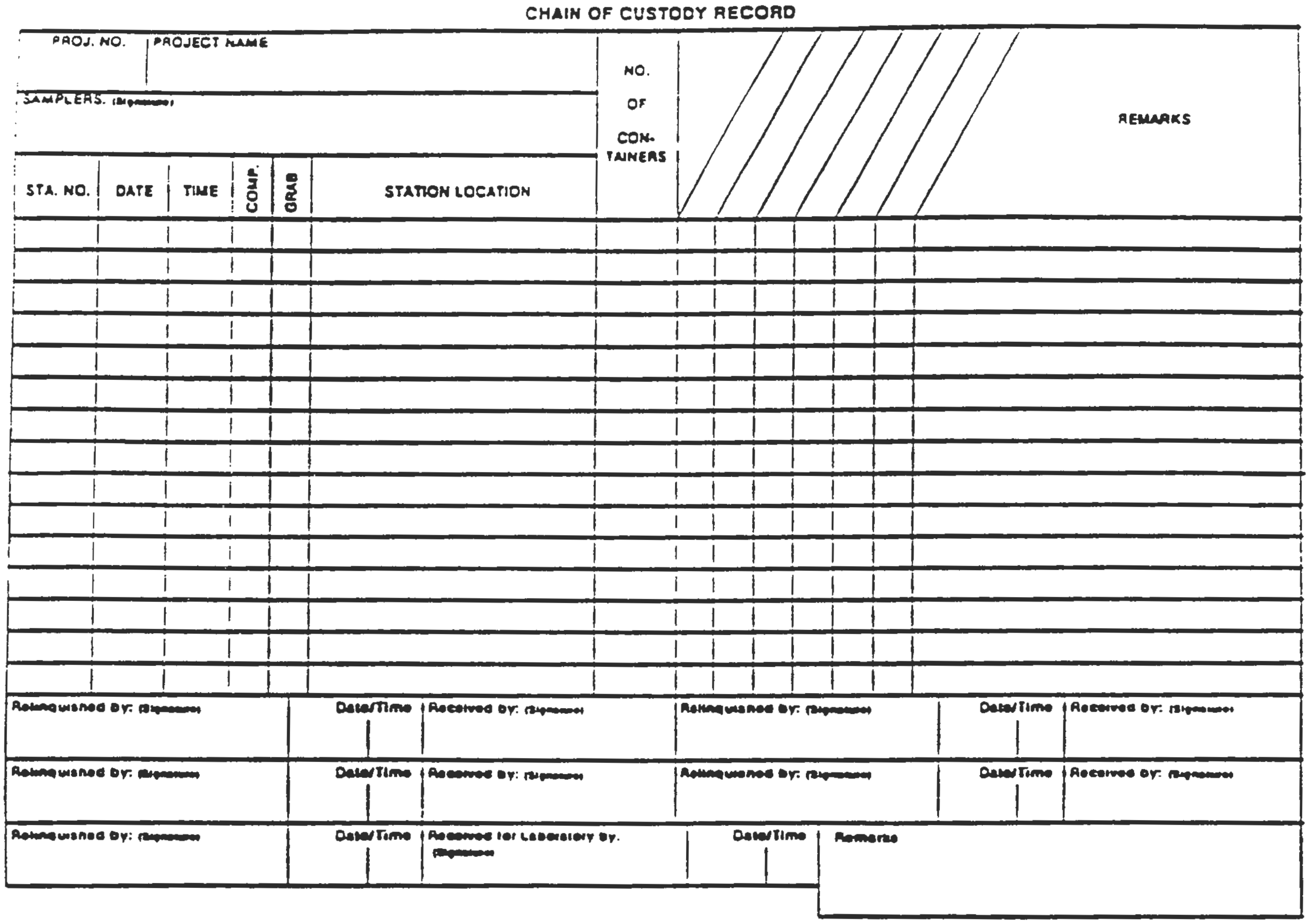
Example: SB001-01/081492/08-10=Soil Boring SB001, Sample Number 1, sampled on August 14, 1992, from a sample interval of 8 to 10 ft.

Duplicate samples should be numbered in sequential order. For example, a duplicate sample collected from the above soil boring example would have a designation as follows:

Example: SB001-02/081492/08-10

Each sample collected must be assigned a unique sample number. Sample numbers should change when the media or location changes. Sample numbers should not change because different analyses are requested. For example, water samples collected at the same location, date, and time for volatile organics, semivolatile organics, and metals analyses would all have the same sample number, although the various sample aliquots would be collected in different containers.

(c) Chain-of-custody. Chain-of-custody procedures provide documentation of the handling of each sample from the time it is collected until it is destroyed. Chain-of-custody procedures are implemented so that a record of sample collection, transfer of samples between personnel, sample shipping, and receipt by the laboratory that will analyze the sample is maintained. Records concerning the cleaning of empty sample containers, container shipment from the laboratory to the site, and security of empty containers at the site should also be maintained. The chain-of-custody (COC) record (Figure F-2) serves as a legal record of possession of the sample. The COC record is initiated with the acquisition of the sample. The COC record remains with the sample at all times and bears the name of the person (field investigator) assuming responsibility for the samples. The field investigator is tasked with ensuring secure and appropriate handling of the bottles and samples. To simplify the COC record and eliminate potential litigation problems, as few people as possible should handle the sample or physical evidence during the investigation. A sample is considered to be under custody if one or more of the following criteria are met:



CHAIN OF CUSTODY RECORD

PROJ. NO. | PROJECT NAME

SAMPLERS. (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS							REMARKS

Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature)

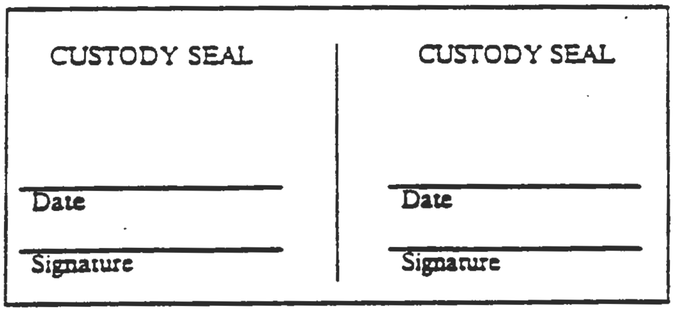
Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature)

Relinquished by: (Signature) | Date/Time | Received for Laboratory by: (Signature) | Date/Time | Remarks

Figure F-2. Chain-of-custody form

- The sample is in the sampler's possession.
- The sample is in the sampler's view after being in possession.
- The sample was in the sampler's possession and then was locked up to prevent tampering.
- The sample is in a designated secure area.

In addition to the COC record, there is also a COC seal. The COC seal (Figure F-3) is an adhesive seal placed in areas such that if a sealed container is opened, the seal would be broken. The COC seal ensures that no sample tampering occurred between the field and the laboratory analysis.



CUSTODY SEAL

Date

Signature

CUSTODY SEAL

Date

Signature

Figure F-3. Chain-of-custody seal

(d) Transfer of custody and shipment. All sample sets should be accompanied by a COC record. When transferring possession of samples, the individual receiving the samples should sign, date, and note the time that

he/she received the samples on the COC record. This COC record documents transfer of custody of samples from the field investigator to another person, other laboratories, or other organizational units. Samples must be properly packaged for shipment and delivered or shipped to the designated laboratory for analyses. Shipping containers must be secured by using nylon strapping tape and custody seals (Instruction F-2). The custody seals must be placed on the container so that it cannot be opened without breaking the seals. The seal must be signed and dated by the field investigator. When samples are split with a facility, state regulatory agency, or other government agency, the agency representative must sign the COC record, if present. All samples should be accompanied by the COC record. As previously discussed, the U.S. Army Corps of Engineers (USACE) tracking number (e.g., LIMS number) that is used in conjunction with the government QA sample shipment must be written on the QA sample's COC record. The original and one copy of the record will be placed in a plastic bag taped to the inside lid of the secured shipping container. One copy of the record will be retained by the field investigator or project leader. The original record will be transmitted to the field investigator or project leader after samples are accepted by the laboratory. This copy will become a part of the project file. If sent by mail, the package should be registered with return receipt requested. If sent by common carrier, an air bill should be used. Receipts from post offices and air bills should be retained as part of the documentation of the chain of custody. The air bill number or registered mail serial number should be recorded in the remarks section of the COC record.

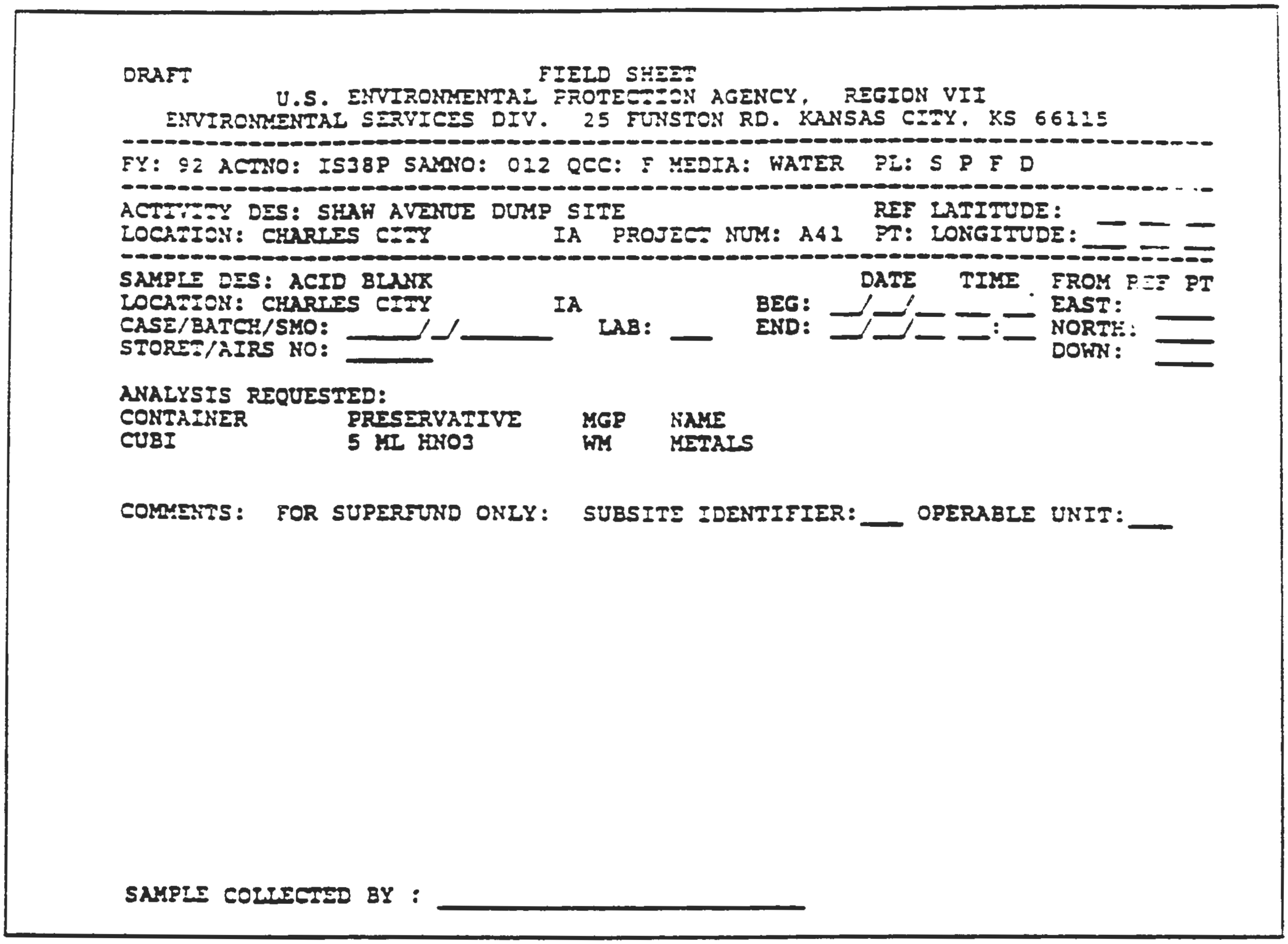
(e) Sample analysis request. To ensure that proper analysis is performed on the samples, additional paperwork may need to be filled out, as required by the lab performing the analysis. This form identifies samples by number, location, and time collected and allows the collector to indicate the desired analysis. This form should act as a supplement/confirmation to the COC record and lab contacts made prior to the sample event initiation.

(5) EPA CLP variances. In addition to the previously discussed documents, if the site under investigation is an Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) site, the EPA will require the following documents:

(a) Field sheets. Field sheets are forms provided by the EPA that correspond to samples that are anticipated to be collected at the site. Figure F-4 is an example of an EPA field sheet. When working on an EPA activity, the field sheet will replace the sample analysis request form. The field sheet contains information specific to that job site and sample, including, but not limited to the following:

- Activity number.
- Project number.
- EPA sample number.
- Analyses requested.
- Sample container.
- Preservatives.
- Sampler.
- Date and time.
- Sampler's signature.

(b) Sample identification tags. Sample identification tags are distributed as needed to field workers by the field sampling leader. Procedures for sample identification tags vary among EPA regions. Generally, the EPA serial numbers are recorded in the project files, the field logbook, and the document control officer's serialized document logbook. Individuals are accountable for each tag assigned to them. A tag is considered to be in an individual's possession until it has been filled out, attached to a sample, and transferred to another individual along with the corresponding COC record. Sample identification tags are not discarded. If tags are lost, voided, or damaged, the facts are noted in the appropriate field logbook, and the field team leader is notified. Figure F-5 is an example of a typical sample identification tag. Upon the completion of the field activities, unused sample identification tags are returned to the document control officer, who checks them against the list of assigned serial numbers. Tags attached to samples that are split with the owner, operator, agent-in-charge, or a government agency are accounted for by recording the serialized tag numbers on the receipt-for-samples form. Alternatively, the split samples are not tagged but are accounted for on a COC record. Samples are transferred from the sample location to a laboratory or another location for analysis. Before transfer, however, a sample is often separated into fractions, depending on the analysis to be performed. Each portion is preserved in accordance with prescribed procedures and is identified with a separate sample identification tag, which should indicate in the "Remarks" section

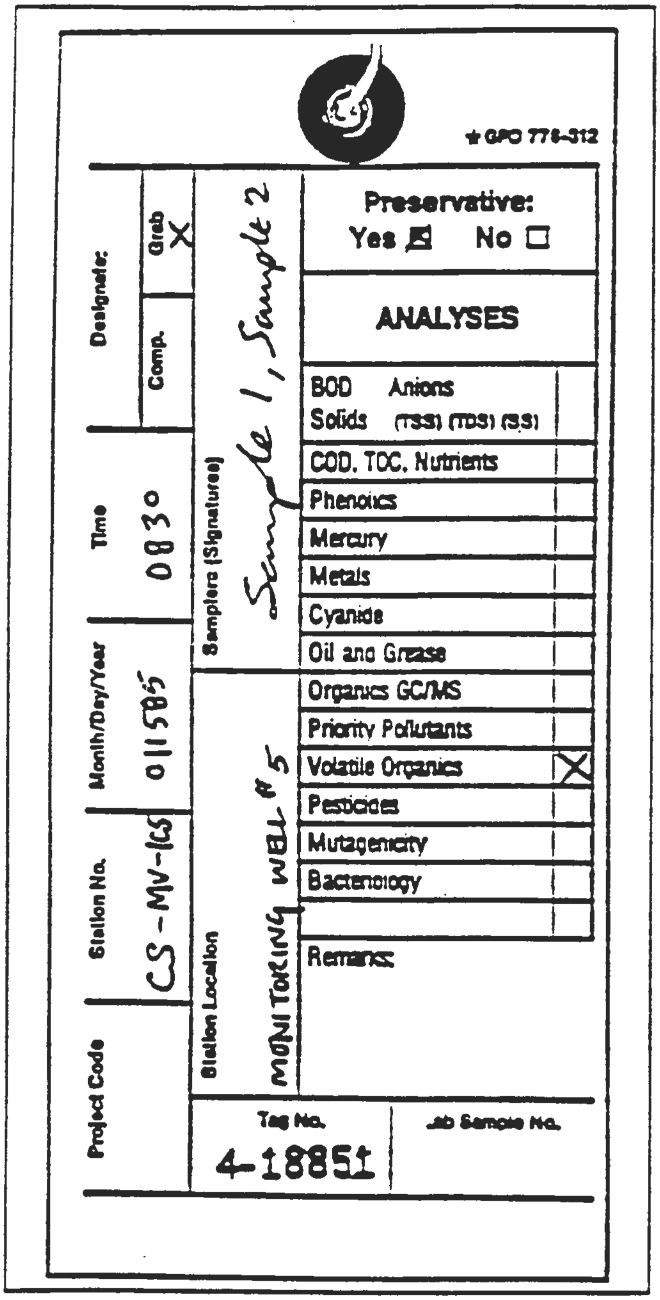


```
DRAFT                             FIELD SHEET
            U.S. ENVIRONMENTAL PROTECTION AGENCY,   REGION VII
   ENVIRONMENTAL SERVICES DIV.   25 FUNSTON RD. KANSAS CITY, KS 66115
-----------------------------------------------------------------------
FY: 92 ACTNO: IS38P SAMNO: 012 QCC: F MEDIA: WATER  PL: S P F D
-----------------------------------------------------------------------
ACTIVITY DES: SHAW AVENUE DUMP SITE                  REF LATITUDE: __ __ __
LOCATION: CHARLES CITY          IA  PROJECT NUM: A41  PT: LONGITUDE:__ __ __
-----------------------------------------------------------------------
SAMPLE DES: ACID BLANK                           DATE    TIME   FROM REF PT
LOCATION: CHARLES CITY          IA           BEG: __/__/__ __ __  EAST:  ____
CASE/BATCH/SMO: _____/_/______     LAB: __   END: __/__/__ __:__  NORTH: ____
STORET/AIRS NO: ______                                            DOWN:  ____

ANALYSIS REQUESTED:
CONTAINER        PRESERVATIVE     MGP   NAME
CUBI             5 ML HNO3        WM    METALS

COMMENTS:  FOR SUPERFUND ONLY:  SUBSITE IDENTIFIER:___  OPERABLE UNIT:___

SAMPLE COLLECTED BY : _________________________
```

Figure F-4. EPA field sheet

that the sample is a split sample. The tag used for water, soil, sediment, and biotic samples contains an appropriate place for identifying the sample as a grab or a composite, the type of sample collected, and the preservative used, if any. The tag used for air samples requires the sampler to designate the sequence number and identify the sample type. Sample identification tags are attached to, or folded around, each sample and are taped in place. After collection, separation, identification and preservation, a sample traffic report is completed and the sample is handled using chain-of-custody procedures discussed in the following sections. If the sample is to be split, aliquots are placed into similar sample containers. Sample identification tags are completed and attached to each split and marked with the tag numbers of the other portions and the word "split." Blank or duplicate samples are labeled in the same manner as "normal" samples. Information on blanks or duplicate samples is recorded in the field logbook.

(c) Sample traffic report. The sample documentation system for the CLP sample preparation program is based on the use of the sample traffic report (TR), a four-part carbonless form printed with a unique sample identification number. One TR and its printed identification number are assigned by the sampler to each sample collected. The three types of TRs currently in use include organic, inorganic dioxin, and high-concentration TRs. Figure F-6 is an example of an organics TR. To provide a permanent record for each sample collected, the sampler completes the appropriate TR, recording the case number, site name or code and location, analysis laboratory, sampling office, dates of sample collection and shipment, and sample concentration and matrix. The sampler enters the



★GPO 778-312

Project Code

Station No. CS-MV-165

Month/Day/Year 011585

Time 0830

Designate: Comp. ☐ Grab X

Samplers (Signatures) Sample 1, Sample 2

Station Location MONITORING WELL #5

Preservative: Yes ☒ No ☐

ANALYSES

BOD Anions Solids (TSS) (TDS) (SS)	
COD, TOC, Nutrients	
Phenolics	
Mercury	
Metals	
Cyanide	
Oil and Grease	
Organics GC/MS	
Priority Pollutants	
Volatile Organics	☒
Pesticides	
Mutagenicity	
Bacteriology	

Remarks:

Tag No. 4-18851

Lab Sample No.

Figure F-5. EPA sample identification tag

numbers of sample containers and volumes beside the analytical parameter(s) requested for particular sample portions. The TR should be placed in the cooler with the COC record and sent to the laboratory.

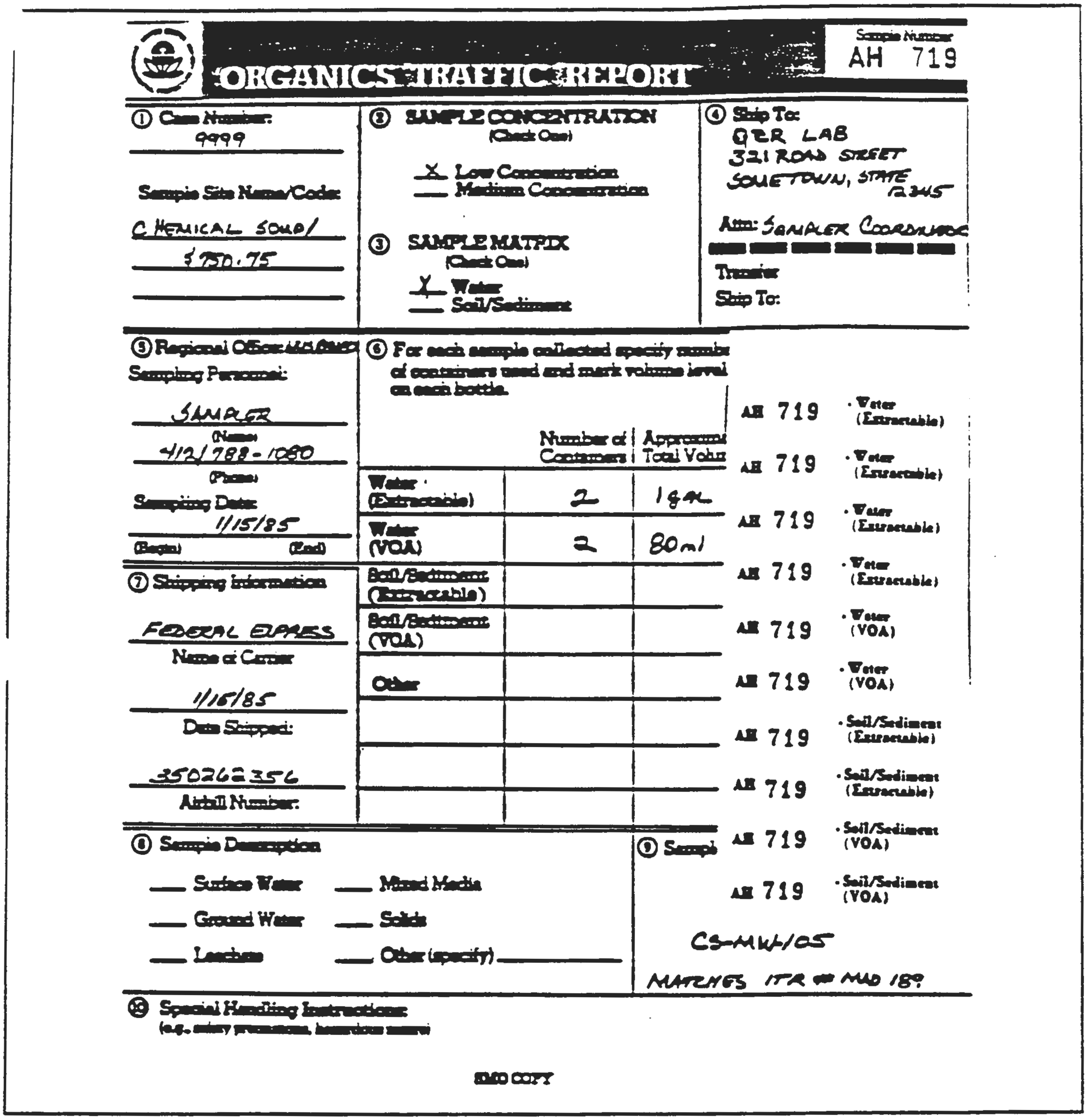
(d) Receipt-for-samples form. Section 3007(a)(2) of the Resource Conservation and Recovery Act states "If the officer, employee, or representative obtains any samples, prior to leaving the premises, he shall give to the owner, operator, or agent-in-charge, a receipt describing the samples obtained and, if requested, a portion of each such sample equal in volume or weight to the portion retained." Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act as amended by the Superfund Amendments and Reauthorization Act (SARA), contains identical requirements. Completing a receipt-for-samples form complies with these requirements: such forms should be used whenever splits are offered or provided to the site owner, operator, or agent-in-charge. Figure F-7 is an example of a typical receipt-for-samples form. This form is completed, and a copy given to the owner, operator, or agent-in-charge even if the offer for split samples is declined. The original is given to the field leader and is retained in the project files. In addition, the contractor must provide analytical results from the samples collected to the owner, operator, or agent in charge, as mandated in SARA.

c. QA/QC requirements.

(1) Corrections to documentation. All original data recorded in field logbooks and on sample labels, chain-of-custody records, and receipt-for-samples forms are written in waterproof ink. If an error is made on an accountable document, corrections should be made simply by crossing out the error and entering the correct information. The erroneous information should not be obliterated. Any error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

(2) Photographs. The photographer should review the photographs or slides when they return from developing and compare them with the photographic log to confirm that the log and photographs match.

d. Potential problems. Although most sample labels are made with water-resistant paper and are filled out using waterproof ink, inclement weather and general field conditions can affect the legibility of sample labels. It is recommended that after sample labels are filled out and affixed to the sample container, the label should be covered with wide clear tape. This will preserve the label and keep it from becoming illegible. In addition to label protection, chain-of-custody and analysis request forms should be protected when samples are shipped in iced coolers. Typically, these forms should be placed inside a ziplock bag or similar waterproof protection and taped to the inside lid of the secured shipping container with the samples.



ORGANICS TRAFFIC REPORT

Sample Number
AH 719

① Case Number:
9999

Sample Site Name/Code:
CHEMICAL SOLD/
$750.75

② SAMPLE CONCENTRATION
(Check One)

X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)

X Water
___ Soil/Sediment

④ Ship To:
QER LAB
321 ROAD STREET
SOMETOWN, STATE
12345

Attn: SAMPLER COORDINATOR

Transfer
Ship To:

⑤ Regional Office: [illegible]
Sampling Personnel:
SAMPLER
(Name)
412/788-1080
(Phone)
Sampling Date:
1/15/85
(Begin) (End)

⑥ For each sample collected specify numbe
of containers used and mark volume level
on each bottle.

	Number of Containers	Approxima Total Volu
Water (Extractable)	2	1 gal
Water (VOA)	2	80 ml
Soil/Sediment (Extractable)		
Soil/Sediment (VOA)		
Other		

⑦ Shipping Information
FEDERAL EXPRESS
Name of Carrier
1/16/85
Date Shipped:
350262356
Airbill Number:

AH 719 · Water (Extractable)
AH 719 · Water (Extractable)
AH 719 · Water (Extractable)
AH 719 · Water (Extractable)
AH 719 · Water (VOA)
AH 719 · Water (VOA)
AH 719 · Soil/Sediment (Extractable)
AH 719 · Soil/Sediment (Extractable)
AH 719 · Soil/Sediment (VOA)
AH 719 · Soil/Sediment (VOA)

⑧ Sample Description

___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other (specify) ________

⑨ Sampl

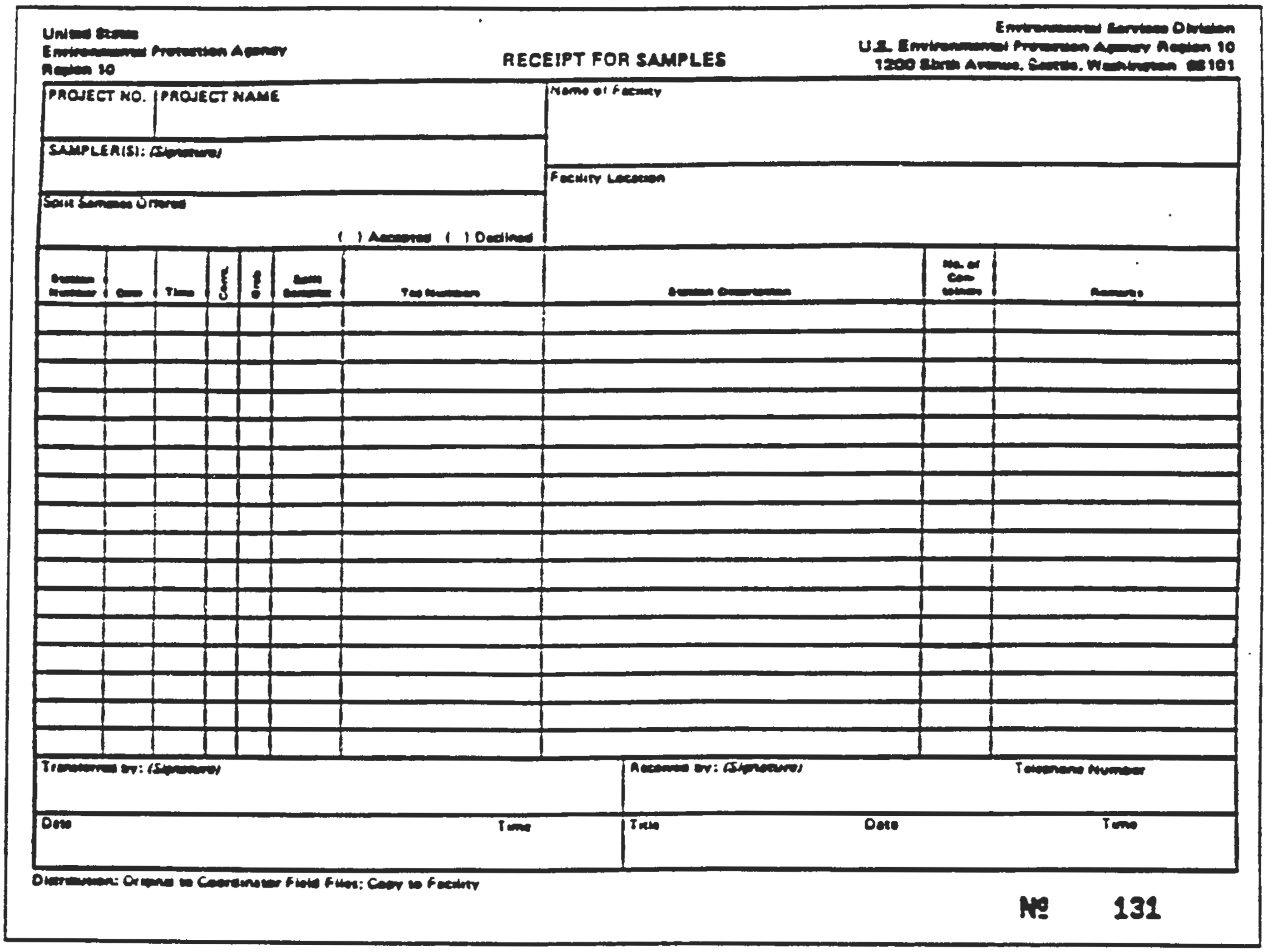
CS-MW/05

MATCHES ITR MAD 18?

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

SMO COPY

Figure F-6. EPA organics traffic report



United States
Environmental Protection Agency
Region 10

RECEIPT FOR SAMPLES

Environmental Services Division
U.S. Environmental Protection Agency Region 10
1200 Sixth Avenue, Seattle, Washington 98101

PROJECT NO.
PROJECT NAME
Name of Facility
SAMPLER(S): (Signature)
Facility Location
Split Samples Offered
( ) Accepted ( ) Declined

Station Number	Date	Time	Comp.	Grab	Split Samples	Tag Numbers	Station Description	No. of Containers	Remarks

Transferred by: (Signature)
Received by: (Signature)
Telephone Number
Date
Time
Title
Date
Time

Distribution: Original to Coordinator Field Files; Copy to Facility

№ 131

Figure F-7. Receipt for samples form

F-2. Packaging and Shipping Procedures

a. Scope and application. This section describes procedures for properly packaging and shipping environmental and hazardous waste samples. The procedures described in this section are performed after samples have been collected and placed in the proper containers and correctly preserved. Guidelines for proper container and preservative selection can be found in Appendix I.

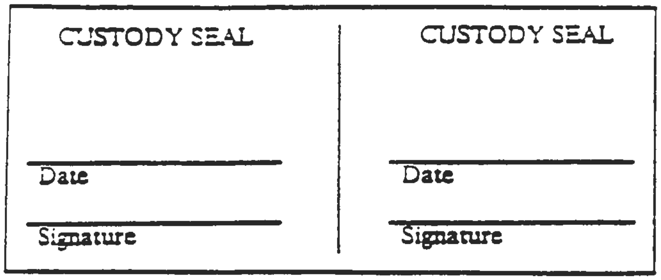
b. Procedures. The following are procedures for packaging and shipping requirements of environmental and hazardous waste samples.

(1) Environmental samples. Environmental samples are defined as those samples collected from environmental matrices such as soil, groundwater, or sediments. Contaminant levels in these types of samples are normally less than 10 ppm. Environmental samples should be packaged for shipment as follows:

(a) Sample container is adequately identified with sample labels (Section b(4)(a) in Instruction F-1). Sample labels are placed on samples at this time if required.

(b) All bottles, except the volatile organic analysis (VOA) vials, are taped shut with electrical tape (or other tape as appropriate). Evidence tape or custody seals (Figure F-8) may be used for additional sample security.

(c) Each sample bottle is placed in a separate plastic bag, which is then sealed. For water samples, each VOA vial is wrapped in a paper towel, and the two vials are placed in one bag. If a trip blank is submitted, it should be wrapped and placed in the bag with the two VOA



CUSTODY SEAL

Date

Signature

CUSTODY SEAL

Date

Signature

Figure F-8. Typical custody seals

vials. As much air as possible is squeezed from the bag before sealing. Bags may be sealed with evidence tape or custody seals for additional security.

(d) A picnic cooler (such as a Coleman or other sturdy cooler) is typically used as a shipping container. In preparation for shipping samples, the drain plug is taped shut from the inside and outside, and a large plastic bag is used as a liner for the cooler. Approximately 3 in. of inert packing material, such as asbestos-free vermiculite, perlite, or styrofoam beads, is placed in the bottom of the liner. Other commercially available shipping containers may be used. However, the use of such containers (cardboard or fiber boxes complete with separators and preservatives) should be specified in the sampling plan and pre-approved.

(e) The bottles are placed upright in the lined picnic cooler in such a way that they do not touch and will not touch during shipment. Cardboard separators may be placed between the bottles at the discretion of the shipper.

(f) All samples should be shipped to the laboratory on ice and chilled to 4 °C *except* for the following types of samples, which do not require shipment with ice:

- Low- and medium-concentration water and liquid matrix samples for metals analyses.
- Medium-concentration soil and sediment matrix samples for base, neutral, acids (B/N/A), polychlorinated biphenyls (PCBs), and pesticide analyses.

However, because prior knowledge of analyte concentrations is required to apply this exception, it may be prudent to maintain the cooling requirement.

(g) Additional inert packing material is placed in the cooler to partially cover the sample bottles (more than halfway). If samples are required to be shipped to the laboratory with ice, ice in double bags must be placed around, among, and on top of the sample bottles. If chemical ice is used, it should be placed in a double plastic bag. The cooler should then be filled with inert packing material and the liner taped shut.

(h) The paperwork going to the laboratory is placed inside a plastic bag. The bag is sealed and taped to the inside of the cooler lid. A copy of the COC form should be included in the paperwork sent to the laboratory. The last block on the COC form should indicate the overnight carrier and air bill number. The air bill must be filled out before the samples are handed over to the carrier. The laboratory should be notified if another sample is being sent to another laboratory for dioxin analysis or if the shipper suspects that the sample contains any other substance that would require laboratory personnel to take additional safety precautions.

(i) The cooler is closed and taped shut with strapping tape (filament-type).

(j) At least two signed custody seals are placed on the cooler, one on the front and one on the side. Additional seals may be used if the sampler or shipper thinks more seals are necessary.

(k) The cooler is handed over to the overnight carrier. A standard air bill is necessary for shipping environmental samples. The shipper should be aware of carrier weight or other policy limitations.

(2) Hazardous samples. Hazardous samples are defined as those which are typically highly contaminated, such as oils, sludges, discarded products, and other materials. Contaminant levels in these types of samples are normally greater than 10 ppm. Hazardous samples must be packaged as follows:

(a) Sample container is adequately identified with sample labels (Section b(4)(a) in Instruction F-1). Sample tags are placed on samples at this time if required.

(b) All bottles, except the VOA vials, are taped closed with electrical tape (or other tape as appropriate). Evidence tape or custody seals may be used for additional security.

(c) Each sample bottle is placed in a plastic bag, and the bag is sealed. As much air as possible is squeezed from the bags before sealing. Evidence tape or custody seals may be used to seal the bags for additional security.

(d) Each bottle is placed upright in a separate paint can, the paint can is filled with vermiculite, and the lid is fixed to the can. The lid must be sealed with metal clips or with filament or evidence tape; if clips are used, the manufacturer typically recommends six clips.

(e) Arrows are placed on the can to indicate which end is up.

(f) The outside of each can must contain the proper Department of Transportation (DOT) shipping name and identification number for the sample. The information may be placed on stickers or printed legibly. A liquid sample of an uncertain nature is shipped as a flammable liquid with the shipping name "FLAMMABLE LIQUID, N.O.S." and the identification number "UN1993." A solid sample of uncertain nature is shipped as a flammable solid with the shipping name "FLAMMABLE SOLID, N.O.S." and the identification number "UN1325." If the nature of the sample is known, 40 CFR 171-177 is consulted to determine the proper labeling and packaging requirements.

(g) The cans are placed upright in a cooler that has had its drain plug taped shut inside and out, and has been lined with a garbage bag. Vermiculite is placed on the bottom. Two sizes of paint cans are used: half-gallon and gallon. The half-gallon paint cans can be stored on top of each other; however, the gallon cans are too tall to stack.

(h) All hazardous samples should be shipped to the laboratory on ice and chilled to 4 °C, except for the following samples which do not require shipment with ice:

- Medium concentration water and liquid matrix samples for metals analysis.
- Medium concentration soil and sediment matrix samples for B/N/A, PCBs, and pesticide analyses.

However, because prior knowledge of the analyte concentrations is required to apply this exception, it may be prudent to maintain the cooling requirement.

(i) Additional inert packing material is placed in the cooler to partially cover the sample bottles. If samples are required to be shipped to the laboratory with ice, bags of ice must be placed around the cans. The cooler must be filled with packing material and the liner taped shut.

(j) The paperwork going to the laboratory is placed inside a plastic bag and taped to the inside of the cooler lid. A copy of the COC form should be included in the paperwork sent to the laboratory. The sampler keeps one copy of the COC form. The laboratory should be notified if a parallel sample is being sent to another laboratory for dioxin analysis, or if the sample is suspected of containing any substance for which laboratory personnel should take safety precautions.

(k) The cooler is closed and sealed with strapping tape. At least two custody seals are placed on the outside of the cooler (one on the front and one on the back). More custody seals may be used at the discretion of the sampler.

(l) The following markings are placed on the top of the cooler:

- Proper shipping name (49 CFR 172.301).
- DOT identification number (49 CFR 172.301).
- Shipper's or consignee's name and address (49 CFR-172.306).
- "This End Up" legibly written if shipment contains liquid hazardous materials (49 CFR 172.312).

(m) The following labels are required on top of the cooler (49 CFR 172.406(e)):

- Appropriate hazard class label (placed next to the proper shipping name).
- "Cargo Aircraft Only" (if applicable as identified in 49 CFR 172.101).

(n) An arrow symbol(s) indicating "This Way Up" should be placed on the cooler in addition to the markings and labels described above.

(o) Restricted-article air bills are used for shipment. The "Shipper Certification for Restricted Articles" section is filled out as follows for flammable solid or a flammable liquid:

- Number of packages or number of coolers.
- Proper shipping name: if unknown, use
  - Flammable solid, N.O.S., or
  - Flammable liquid, N.O.S.

- Classification: if unknown, use
    - Flammable solid, N.O.S., or
    - Flammable liquid, N.O.S.
- Identification number: if unknown, use
    - UN1325 (for flammable solids), or
    - UN1993 (for flammable liquids).
- Net quantity per package or amount of substance in each cooler.
- Radioactive materials section (Leave blank).
- Passenger or cargo aircraft. (Cross off the non-applicable. Up to 25 lb of flammable solid per cooler can be shipped on a passenger or cargo aircraft. Up to 1 qt of flammable liquid per cooler can be shipped on a passenger aircraft, and up to 10 gal of flammable liquid per cooler can be shipped on a cargo aircraft.)
- Name and title of shipper (printed).
- An emergency telephone number at which the shipper can be reached within the following 24 to 48 hr.
- Shipper's signature.

c. Sample containers and preservatives. Appendix I provides information concerning sample containers and preservatives.

ATTACHMENT 3

EXAMPLE SAMPLE TABLE FROM EM 200-1-3

Table 3-3
Example Sample Table

Sample Location	Sample Depth	Sample Number (Primary Lab)	QC Sample Number (Primary Lab)	Associated Trip Blank Number (Primary Lab)	Associated Rinsate Blank (Primary Lab)	Sample Number (QA Lab)	Associated Trip Blank Number (QA Lab)	Associated Rinsate Blank (QA Lab)	EPA 8240	EPA 8270	EPA 239.2	EPA 418.1
T-1	4-6 ft bgs	T-1	-	TB-1	RB-1	-	-	-	X	X	X	X
T-2	6-8 ft bgs	T-2	-	TB-1	RB-1	-	-	-	X	X	X	X
T-3	2-4 ft bgs	T3/S-1	T3/S-4	TB-1	RB-1	T3/S-1/QA	TB-1/QA	RB-1/QA	X	X	X	X
	4-8 ft bgs	T3/S-2	-	TB-1	RB-1	-	-	-	X	X	X	-
	8-12 ft bgs	T3/S-3	-	TB-1	-	-	-	-	X	-	-	-
T-4	6-8 ft bgs	T-4	-	TB-2	RB-1	-	-	-	X	X	X	X
T-5	2-4 ft bgs	T5/S-1	T5/S-4	TB-2	RB-1	T5/S-1/QA	TB-2/QA	RB-1/QA	X	X	X	X
	4-8 ft bgs	T5/S-2	-	TB-2	RB-1	-	-	-	X	X	X	-
	8-12 ft bgs	T5/S-3	-	TB-2	-	-	-	-	X	-	-	-
T-11	6-8 ft bgs	T-11	-	TB-2	RB-1	-	-	-	X	X	X	X
T-14	6-8 ft bgs	T-14	-	TB-2	RB-2	-	-	-	X	X	X	X
T-23	2-4 ft bgs	T-23	-	TB-2	RB-2	-	-	-	X	X	X	X

Notes:
1. The spatial relationship of sample and blank numbers in the table is important. This design of the sample numbers themselves is not required. However, duplicate samples must be blind to the primary laboratory.
2. ER 1110-1-263 (1 Oct 90) does not require rinstate blanks for soil sampling activities, but allows for them if project specific considerations warrant.
3. This table should be prepared prior to field activities and included in the Sampling and Analysis Plan (SAP). The table prepared after field activities would document any deviation from the plan.

ATTACHMENT 4

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN
SOIL AND SEDIMENT REMEDIATION
OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

REVISED DRAFT

Contract No. DACW33-95-D-0004
Delivery Order No. 0013
DCN: SEDA-042399-AACN

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
NORTH ATLANTIC DIVISION
NEW ENGLAND DISTRICT
696 Virginia Road
Concord, Massachusetts 01742-2751

Prepared by:

ROY F. WESTON, INC.
One Wall Street
Manchester, New Hampshire 03101-1501

April 1999

W.O. No. 03886-118-0160-01

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APPENDIX A – LABORATORY CERTIFICATION

LIST OF TABLES

Title **Page**

LIST OF ACRONYMS

AALA	American Association for Laboratory Accreditation
BS	Blank Spike
BSD	Blank Spike Duplicate
BNAs	Base/Neutral/Acids
BRAC	Base Realignment and Closure
CAR	Corrective Action Report
CCQC	Contractor Chemical Quality Control
CFR	Code of Federal Regulations
CLP	Contract Laboratory Protocol
DCQCRs	Daily Chemical Quality Control Reports
DOD	Department of Defense
DQOs	Data Quality Objectives
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
ft^2	Square Feet
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectroscopy
GSA	General Services Administration
HCl	Hydrochloric Acid
HEPA	High-Efficiency Particulate Air
IDL	Instrument Detection Limit
IDWs	Investigation-Derived Wastes
LCS	Laboratory Control Spike
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
mg/L	Milligrams per Liter
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute for Occupational Safety and Health
OB	Open Burning
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls

LIST OF ACRONYMS
(CONTINUED)

PES	Performance Evaluation Studies
PM	Project Manager
PPE	Personal Protective Equipment
PSMs	Program Safety Managers
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCC	Quality Control Contractor
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SM	Site Manager
SOPs	Standard Operating Procedures
SOW	Scope Of Work
SRM	Standard Reference Material
SSHASP	Site-Specific Health and Safety Plan
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOCs	Semivolatile Organic Compounds
TAT	Turnaround Time
TCLP	Toxicity Characteristic Leaching Procedure
USACE	U.S. Army Corps of Engineers
VOCs	Volatile Organic Compounds
WBS	Work Breakdown Structure
WESTON®	Roy F. Weston, Inc.
XRF	X-ray Fluorescence

SECTION 1

PROJECT DESCRIPTION

1. PROJECT DESCRIPTION

A description of this project is provided in Section 1 of the FSP.

SECTION 2

PROJECT ORGANIZATION AND RESPONSIBILITIES

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

The project organization and personnel responsibilities are presented in Figure 2-1 in the Work Plan.

SECTION 3

DATA QUALITY OBJECTIVES

3. DATA QUALITY OBJECTIVES

This section describes the Quality Assurance objectives for the data relative to its intended use.

3.1 BACKGROUND

The purpose of this project is to excavate contaminated soil and sediment in the Open Burning Grounds site (SEAD-23) at the Seneca Army Depot Activity (SEDA). Concurrent with screening activities for unexploded ordnance (UXO), these contaminated soils and sediments will be removed, tested. and disposed as necessary. Throughout the excavation activities, it will be necessary to dewater the excavation area and treat the water prior to discharge. Finally, all areas of the 30-acre Open Burning (OB) Grounds site with total lead concentrations greater than 60 mg/kg will be covered with clean fill, and all disturbed areas of the site will be re-vegetated.

Expected contaminants in the OB Grounds are metals (primarily lead) and residual explosives. A summary of the areas and matrices to be sampled, their associated analytical methods, and the data quality objectives (DQOs) for these analyses is presented in Table 3-1. Sample quantity estimates for each area that will be sampled is located in Table 4-2 of the FSP.

3.2 QA OBJECTIVES FOR CHEMICAL DATA MEASUREMENT

The Laboratory Analytical Methods and the DQOs are listed in Table 3-1.

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
CONFIRMATION SOIL SAMPLES							
Lead (total)	3050B/6010B	500[3]	mg/kg	0.5	48 - 130	30	90
PERIMETER SOIL SAMPLES (Grid, Perimeter, Staging Area, and Haul Road)							
Lead (total)	3050B/6010B	60[3]	mg/kg	0.5	48 - 130	30	90
STABILIZED SOIL							
METALS (TCLP)[4]							
Silver	1311/6010B	NA	mg/L	0.030	50 - 150	20	90
Arsenic	1311/6010B	NA	mg/L	0.300	50 - 150	20	90
Barium	1311/6010B	NA	mg/L	0.060	50 - 150	20	90
Cadmium	1311/6010B	NA	mg/L	0.015	50 - 150	20	90
Chromium	1311/6010B	NA	mg/L	0.030	50 - 150	20	90
Mercury	7470	NA	mg/L	0.010	50 - 150	20	90
Lead	1311/6010B	5.0	mg/L	0.150	50 - 150	20	90
Selenium	1311/6010B	NA	mg/L	0.300	50 - 150	20	90
STABILIZED SOIL BENCH TESTING							
Lead (TCLP)[4]	1311/6010B	5	mg/L	0.15	50 - 150	20	90
PERSONNEL AIR MONITORING							
Lead	NIOSH 7300	NA	µg/filter	0.5	70 - 130	30	90
TREATED EFFLUENT- Class C Effluent Discharge Criteria							
METALS (TAL)							
Aluminum	3010A/6010B	4	mg/L	0.100	73 - 131	20	95
Arsenic	3010A/6010B	NA	mg/L	0.005	77 - 114	20	95
Barium	3010A/6010B	NA	mg/L	0.020	74 - 117	20	95
Berylium	3010A/6010B	NA	mg/L	0.005	78 - 117	20	95
Chromium	3010A/6010B	0.182	mg/L	0.010	80 - 113	20	95
Copper	3010A/6010B	0.046	mg/L	0.020	79 - 117	20	95
Lead	3010A/6010B	0.03	mg/L	0.005	63 - 116	20	95
Manganese	3010A/6010B	0.3	mg/L	0.010	82 - 116	20	95
Nickel	3010A/6010B	0.132	mg/L	0.020	73 - 119	20	95
Vanadium	3010A/6010B	NA	mg/L	0.020	78 - 115	20	95
Silver	3010A/6010B	0.027	mg/L	0.010	51 - 126	20	95
Calcium	3010A/6010B	NA	mg/L	0.500	70 - 130	20	95
Cadmium	3010A/6010B	0.006	mg/L	0.005	76 - 106	20	95
Cobalt[7]	3010A/6010B	0.005	mg/L	0.020	71 - 129	20	95

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Iron	3010A/6010B	0.3	mg/L	0.050	74 - 125	20	95
Potassium	3010A/6010B	NA	mg/L	1.000	70 - 130	20	95
Magnesium	3010A/6010B	NA	mg/L	0.500	70 - 130	20	95
Sodium	3010A/6010B	NA	mg/L	1.000	70 - 130	20	95
Mercury	7470	0.0008	mg/L	0.0001	79 - 120	20	95
Antimony	3010A/6010B	NA	mg/L	0.060	74 - 121	20	95
Selenium[7]	3010A/6010B	0.0046	mg/L	0.010	79 - 113	20	95
Thallium	3010A/6010B	NA	mg/L	0.005	69 - 127	20	95
Vanadium[7]	3010A/6010B	0.014	mg/L	0.020	78 - 115	20	95
Zinc	3010A/6010B	0.21	mg/L	0.010	80 - 115	20	95
Cyanide	335.3		mg/L	0.010	75 - 125	20	95
EXPLOSIVES							
RDX	8330	NLE	mg/L	0.001	60 - 133	30	95
2,6 Dinitrotoluene	8330	NLE	mg/L	0.001	40 - 150	30	95
MISCELLANEOUS							
Total Dissolved Solids	160.1	500	mg/L	10.000	NA	20	95
pH	150.1	6.5 - 8.5	units	NA	NA	10	95
WASTE CHARACTERIZATION - SOIL SAMPLES (Unstabilized Soil, Stabilized soils, Creek Sediments, Bench Verification, Access Road, and Staging Area)							
METALS (TOTAL)							
Silver	3050B/6010B	NA	mg/kg	1.00	69 - 108	30	90
Arsenic	3050B/6010B	NA	mg/kg	0.50	78 - 109	30	90
Barium	3050B/6010B	NA	mg/kg	2.00	76 - 109	30	90
Cadmium	3050B/6010B	NA	mg/kg	0.50	63 - 114	30	90
Chromium	3050B/6010B	NA	mg/kg	1.00	57 - 126	30	90
Mercury	7471	NA	mg/kg	0.02	80 - 109	30	90
Lead	3050B/6010B	NA	mg/kg	0.50	48 - 130	30	90
Aluminum	3050B/6010B	NA	mg/kg	10.00	46 - 109	30	90
Beryllium	3050B/6010B	NA	mg/kg	0.50	73 - 117	30	90
Calcium	3050B/6010B	NA	mg/kg	50.00	70 - 130	30	90
Cobalt	3050B/6010B	NA	mg/kg	2.00	77 - 114	30	90
Copper	3050B/6010B	NA	mg/kg	2.00	54 - 135	30	90
Iron	3050B/6010B	NA	mg/kg	5.00	70 - 130	30	90
Potassium	3050B/6010B	NA	mg/kg	100	70 - 130	30	90
Magnesium	3050B/6010B	NA	mg/kg	50.00	70 - 130	30	90
Manganese	3050B/6010B	NA	mg/kg	1.00	70 - 130	30	90
Sodium	3050B/6010B	NA	mg/kg	100	70 - 130	30	90
Nickel	3050B/6010B	NA	mg/kg	2.00	70 - 116	30	90
Antimony	3050B/6010B	NA	mg/kg	6.00	3 - 142	30	90
Thallium	3050B/6010B	NA	mg/kg	0.50	72 - 107	30	90
Vanadium	3050B/6010B	NA	mg/kg	2.00	77 - 115	30	90

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Zinc	3050B/6010B	NA	mg/kg	1.00	57 - 132	30	90
Selenium	3050B/6010B	NA	mg/kg	1.00	74 - 109	30	90
METALS (TCLP)[4]							
Silver	1311/6010B	5.0	mg/L	0.030	50 - 150	20	90
Arsenic	1311/6010B	5.0	mg/L	0.300	50 - 150	20	90
Barium	1311/6010B	100	mg/L	0.060	50 - 150	20	90
Cadmium	1311/6010B	1.0	mg/L	0.015	50 - 150	20	90
Chromium	1311/6010B	5.0	mg/L	0.030	50 - 150	20	90
Mercury	7470	0.2	mg/L	0.010	50 - 150	20	90
Lead	1311/6010B	5.0	mg/L	0.150	50 - 150	20	90
Selenium	1311/6010B	1.0	mg/L	0.300	50 - 150	20	90
PCBs[5]							
Aroclor-1016	3540C/8082	50000	ug/kg	25	40 - 140	30	90
Aroclor-1221	3540C/8082	50000	ug/kg	40	50 - 150	30	90
Aroclor-1232	3540C/8082	50000	ug/kg	20	50 - 150	30	90
Aroclor-1242	3540C/8082	50000	ug/kg	20	50 - 150	30	90
Aroclor-1248	3540C/8082	50000	ug/kg	20	50 - 150	30	90
Aroclor-1254	3540C/8082	50000	ug/kg	20	40 - 120	30	90
Aroclor-1260	3540C/8082	50000	ug/kg	20	40 - 160	30	90
PESTICIDES (TOTAL)							
alpha-BHC	3540C/8081A	NA	ug/kg	1.00	70 - 130	30	90
beta-BHC	3540C/8081A	NA	ug/kg	1.00	60 - 130	30	90
delta-BHC	3540C/8081A	NA	ug/kg	1.00	60 - 130	30	90
gamma-BHC (lindane)	3540C/8081A	NA	ug/kg	1.00	38 - 153	30	90
Heptachlor	3540C/8081A	NA	ug/kg	1.00	60 -155	30	90
Aldrin	3540C/8081A	NA	ug/kg	1.00	48 - 140	30	90
Heptachlor epoxide	3540C/8081A	NA	ug/kg	1.00	60 - 120	30	90
Endosulfan I	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
Dieldrin	3540C/8081A	NA	ug/kg	2.00	53 - 146	34	90
4,4'-DDE	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
Endrin	3540C/8081A	NA	ug/kg	2.00	52 - 159	32	90
Endosulfan II	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
4,4'-DDD	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
Endosulfan sulfate	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
4,4'-DDT	3540C/8081A	NA	ug/kg	2.00	16 - 182	37	90
Methoxychlor	3540C/8081A	NA	ug/kg	10.00	70 - 130	30	90
Endrin ketone	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
alpha-Chlordane	3540C/8081A	NA	ug/kg	1.00	70 - 130	30	90
gamma-Chlordane	3540C/8081A	NA	ug/kg	1.00	70 - 130	30	90
Toxaphene	3540C/8081A	NA	ug/kg	50.00	70 - 130	30	90
Endrin aldehyde	3540C/8081A	NA	ug/kg	2.00	50 - 130	30	90
PESTICIDES (TCLP)[4]							

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method^1	Regulatory Disposal Criteria^2	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Methoxychlor	1311/8150	10	mg/L	0.020	70 - 130	35	90
Endrin	1311/8150	0.02	mg/L	0.005	70 - 130	35	90
chlordane	1311/8150	0.03	mg/L	0.020	70 - 130	35	90
Heptachlor	1311/8150	0.008	mg/L	0.0025	70 - 130	35	90
lindane	1311/8150	0.4	mg/L	0.0025	70 - 130	35	90
Toxaphene	1311/8150	0.5	mg/L	0.100	70 - 130	35	90
HERBICIDES (TCLP)^4							
2,4-D	1311/8150	10	mg/L	0.250	49 - 125	20	90
2,4,5-TP	1311/8150	1	mg/L	0.025	68 - 125	20	90
VOCs (TOTAL)							
1,1,1-Trichloroethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
1,1,2,2-Tetrachloroethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
1,1,2-Trichloroethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
1,1-Dichloroethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
1,1-Dichloroethene	5030A/8260B	NA	ug/kg	5	59 - 172	22	90
1,2-Dichloroethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
1,2-Dichloropropane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
2-Chloroethyl Vinyl Ether (mixed)	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Acrylonitrile	5030A/8260B	NA	ug/kg	100	70 - 130	30	90
Allyl chloride	5030A/8260B	NA	ug/kg	50	70 - 130	30	90
Benzene	5030A/8260B	NA	ug/kg	5	66 - 142	21	90
Benzyl chloride	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Bromodichloromethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Bromoform	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Bromomethane	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Carbon Disulfide	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Carbon Tetrachloride	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Chlorobenzene	5030A/8260B	NA	ug/kg	5	60 - 133	21	90
Chloroethane	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Chloroform	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Chloromethane	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
cis-1,3-Dichloropropene	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Dibromochloromethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Ethylbenzene	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
2-Hexanone	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Methylene Chloride	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
4-Methyl-2-pentanone	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Styrene	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Tetrachloroethene	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Toluene	5030A/8260B	NA	ug/kg	5	59 - 139	21	90

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
trans-1,2-Dichloroethene	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
trans-1,3-Dichloropropene	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Trichloroethylene	5030A/8260B	NA	ug/kg	5	62 - 137	24	90
Trichlorofluoromethane	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
Vinyl Acetate	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Vinyl Chloride	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Xylene (total)	5030A/8260B	NA	ug/kg	5	70 - 130	30	90
VOCs (TCLP)[4]							
Benzene	1311/8260B	0.5	mg/L	0.05	76-127	11	90
Carbon Tetrachloride	1311/8260B	0.5	mg/L	0.05	70-130	30	90
Chlorobenzene	1311/8260B	100	mg/L	0.05	75-130	13	90
Chloroform	1311/8260B	6	mg/L	0.05	70-130	30	90
1,2-Dichloroethane	1311/8260B	0.5	mg/L	0.05	70-130	30	90
1,1-Dichloroethene	1311/8260B	0.7	mg/L	0.05	61-145	14	90
methyl ethyl ketone	1311/8260B	200	mg/L	0.1	70-130	30	90
Tetrachloroethene	1311/8260B	0.7	mg/L	0.05	70-130	30	90
Trichloroethylene	1311/8260B	0.5	mg/L	0.05	71-120	14	90
Vinyl Chloride	1311/8260B	0.2	mg/L	0.1	70-130	30	90
SVOCs (TOTAL)							
2,4-Dinitrotoluene	3541B/8270C	NA	ug/kg	330	33-95	20	90
2-Methylnaphthalene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Acenaphthene	3541B/8270C	NA	ug/kg	330	30-109	17	90
Acenaphthylene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Anthracene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(a)anthracene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(a)pyrene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(b)fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(g,h,i)perylene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(k)fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Bis(2-ethylhexyl)phthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Butylbenzylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Chrysene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Di-n-butylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Di-n-octylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Dibenzo(a,h)anthracene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Fluorene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Indeno(1,2,3-cd)pyrene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Naphthalene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Phenanthrene	3541B/8270C	NA	ug/kg	330	70-130	45	90
phenol	3541B/8270C	NA	ug/kg	330	20-132	25	90

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Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Bis(2-Chloroethyl)ether	3541B/8270C	NA	ug/kg	330	70-130	45	90
2-Chlorophenol	3541B/8270C	NA	ug/kg	330	20-132	16	90
1.2-dichlorobenzene	3541B/8270C	NA	ug/kg	330	12-99	45	90
1.3-Dichlorobenzene	3541B/8270C	NA	ug/kg	330	70-130	45	90
1.4-Dichlorobenzene	3541B/8270C	NA	ug/kg	330	70-130	31	90
2-Methylphenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
2,2'-oxybis(1-Chloropropane)	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Methylphenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
N-Nitroso-di-n-propylamine	3541B/8270C	NA	ug/kg	330	30-106	19	90
Hexachloroethane	3541B/8270C	NA	ug/kg	330	70-130	45	90
nitrobenzene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Isophorone	3541B/8270C	NA	ug/kg	330	70-130	45	90
2-Nitrophenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
2.4-Dimethylphenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzoic acid	3541B/8270C	NA	ug/kg	1600	70-130	45	90
Bis(2-Chloroethoxy)methane	3541B/8270C	NA	ug/kg	330	70-130	45	90
2.4-Dichlorophenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
1.2.4-Trichlorobenzene	3541B/8270C	NA	ug/kg	330	17-106	28	90
Benzyl alcohol	3541B/8270C	NA	ug/kg	330	70-130	45	90
Hexachlorobutadiene	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Chloro-3-methylphenol	3541B/8270C	NA	ug/kg	330	33-113	16	90
Hexachlorocyclopentadiene	3541B/8270C	NA	ug/kg	330	70-130	45	90
2.4,6-trichlorophenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
2.4.5-trichlorophenol	3541B/8270C	NA	ug/kg	1600	70-130	45	90
2-Chloronaphthalene	3541B/8270C	NA	ug/kg	330	70-130	45	90
2-Nitroaniline	3541B/8270C	NA	ug/kg	1600	70-130	45	90
Dimethylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
3-Nitroaniline	3541B/8270C	NA	ug/kg	1600	70-130	45	90
2.4-Dinitrophenol	3541B/8270C	NA	ug/kg	1600	70-130	45	90
4-Nitrophenol	3541B/8270C	NA	ug/kg	1600	36-107	23	90
Dibenzofuran	3541B/8270C	NA	ug/kg	330	70-130	45	90
Diethylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Chlorophenylphenylether	3541B/8270C	NA	ug/kg	330	70-130	45	90
2.6-Dinitrotoluene	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Nitroaniline	3541B/8270C	NA	ug/kg	1600	70-130	45	90
4.6-Dinitro-2-methylphenol	3541B/8270C	NA	ug/kg	1600	70-130	45	90
N-Nitrosodiphenylamine	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Bromophenylphenylether	3541B/8270C	NA	ug/kg	330	70-130	45	90
hexachlorobenzene	3541B/8270C	NA	ug/kg	330	70-130	45	90
pentachlorophenol	3541B/8270C	NA	ug/kg	1600	34-116	50	90
3.3'-Dichlorobenzidine	3541B/8270C	NA	ug/kg	660	70-130	45	90
Benzo(b)fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Chloroaniline	3541B/8270C	NA	ug/kg	330	70-130	45	90

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Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Pyrene	3541B/8270C	NA	ug/kg	330	31-126	26	90
SVOCs (TCLP)[4]							
1,4-dichlorobenzene	1311/8270B	7.5	mg/L	0.1	10-125	40	90
hexachloroethane	1311/8270B	3	mg/L	0.1	10-125	40	90
hexachloro-1,3-butadiene	1311/8270B	0.5	mg/L	0.1	10-125	40	90
hexachlorobenzene	1311/8270B	0.13	mg/L	0.1	10-125	40	90
O-cresol (2-Methylphenol)	1311/8270B	200	mg/L	0.1	10-125	40	90
M-cresol (3-Methylphenol)	1311/8270B	200	mg/L	0.2	10-125	40	90
P-cresol (4-Methylphenol)	1311/8270B	200	mg/L	0.2	10-125	40	90
Cresol	1311/8270B	200	mg/L	0.2	10-125	40	90
2,4-Dinitrotoluene	1311/8270B	0.13	mg/L	0.1	10-125	40	90
nitrobenzene	1311/8270B	2	mg/L	0.1	10-125	40	90
pentachlorophenol	1311/8270B	100	mg/L	0.5	10-125	40	90
pyridine	1311/8270B	5	mg/L	1	10-125	40	90
2,4,5-trichlorophenol	1311/8270B	400	mg/L	0.5	10-125	40	90
2,4,6-trichlorophenol	1311/8270B	2	mg/L	0.1	10-125	40	90
MISCELLANEOUS							
REACTIVITY[6]	SW846						
Reactive Cyanide	7.3.3.2	non-reactive	mg/kg	0.50	0-100	20	90
Reactive Sulfide	7.3.4.2	non-reactive	mg/kg	170	10-80	20	90
PAINT FILTER	9095	Pass	NA	NA	NA	NA	NA
IGNITABILITY[6]	1010	>60	°C	NA	80-120	10	90
CORROSIVITY[5]	9045A	250	mg/kg	NA	NA	10	90
PERCENT MOISTURE	2540G	<80	%	0.1	NA	20	90
pH	9045C	2 - 12.5	pH units	NA	NA	10	90
EXPLOSIVES	8330						
2,4,6-trinitrotoluene	8330	NA	mg/kg	0.25	65 - 140	30	90
2,4-dinitrotoluene	8330	NA	mg/kg	0.25	65 - 140	30	90
2,6-dinitrotoluene	8330	NA	mg/kg	0.25	65 - 140	30	90
2-amino-4,6-dinitrotoluene	8330	NA	mg/kg	1.00	50 - 150	30	90
2-nitrotoluene	8330	NA	mg/kg	0.25	60 - 140	30	90
3-nitrotoluene	8330	NA	mg/kg	0.25	65 - 130	30	90
4-amino--2,6-dinitrotoluene	8330	NA	mg/kg	1.00	35 - 160	30	90
4-nitrotoluene	8330	NA	mg/kg	0.25	70 - 130	30	90
HMX	8330	NA	mg/kg	1.00	55 - 130	30	90
m-dinitrobenzene	8330	NA	mg/kg	0.25	70 - 130	30	90
nitrobenzene	8330	NA	mg/kg	1.00	70 - 130	30	90
RDX	8330	NA	mg/kg	1.00	70 - 130	30	90
sym-trinitrobenzene	8330	NA	mg/kg	0.25	45 - 130	30	90
tetryl	8330	NA	mg/kg	1.00	30 - 130	30	90

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					DQOs		
Analytes of Concern	**Method[1]**	**Regulatory Disposal Criteria[2]**	**Units**	**PQL**	**Accuracy (% R)**	**Precision (% RSD)**	**Completeness (% Valid Data)**
CLEAN FILL SAMPLES							
VOCs							
1,1,1-Trichloroethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
1,1,2,2-Tetrachloroethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
1,1,2-Trichloroethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
1,1-Dichloroethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
1,1-Dichloroethene	5030A/8260B	ND or BKG	ug/kg	5	59-178	22	90
1,2-Dichloroethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
1,2-Dichloropropane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
2-Chloroethyl Vinyl Ether (mixed)	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
Acrylonitrile	5030A/8260B	ND or BKG	ug/kg	100	70-130	30	90
Allyl alcohol	5030A/8260B	ND or BKG	ug/kg	NA	NA	NA	NA
Allyl chloride	5030A/8260B	ND or BKG	ug/kg	50	70 - 130	30	90
Benzene	5030A/8260B	ND or BKG	ug/kg	5	66-142	21	90
Benzyl chloride	5030A/8260B	ND or BKG	ug/kg	10	70 - 130	30	90
Bromodichloromethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Bromoform	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Bromomethane	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
Carbon Disulfide	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Carbon Tetrachloride	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Chlorobenzene	5030A/8260B	ND or BKG	ug/kg	5	60-133	21	90
Chloroethane	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
Chloroform	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Chloromethane	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
cis-1,3-Dichloropropene	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Dibromochloromethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Ethylbenzene	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
2-Hexanone	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
Methylene Chloride	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
4-Methyl-2-pentanone	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
Styrene	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Tetrachloroethene	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Toluene	5030A/8260B	ND or BKG	ug/kg	5	59-139	21	90
trans-1,2-Dichloroethene	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
trans-1,3-Dichloropropene	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Trichloroethylene	5030A/8260B	ND or BKG	ug/kg	5	62-137	24	90
Trichlorofluoromethane	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
Vinyl Acetate	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90

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Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Vinyl Chloride	5030A/8260B	ND or BKG	ug/kg	10	70-130	30	90
Xylene (total)	5030A/8260B	ND or BKG	ug/kg	5	70-130	30	90
SVOCs							
2,4-Dinitrotoluene	3541B/8270C	ND or BKG	ug/kg	330	33-95	20	90
2-Methylnaphthalene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Acenaphthene	3541B/8270C	ND or BKG	ug/kg	330	30-109	17	90
Acenaphthylene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Anthracene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Benzo(a)anthracene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Benzo(a)pyrene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Benzo(b)fluoranthene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Benzo(g,h,i)perylene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Benzo(k)fluoranthene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Bis(2-ethylhexyl)phthalate	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Butylbenzylphthalate	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Chrysene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Di-n-butylphthalate	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Di-n-octylphthalate	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Dibenzo(a,h)anthracene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Fluoranthene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Fluorene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Indeno(1,2,3-cd)pyrene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Naphthalene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Phenanthrene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
phenol	3541B/8270C	ND or BKG	ug/kg	330	20-132	25	90
Bis(2-Chloroethyl)ether	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2-Chlorophenol	3541B/8270C	ND or BKG	ug/kg	330	20-132	16	90
1,2-dichlorobenzene	3541B/8270C	ND or BKG	ug/kg	330	12-99	45	90
1,3-Dichlorobenzene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
1,4-Dichlorobenzene	3541B/8270C	ND or BKG	ug/kg	330	70-130	31	90
2-Methylphenol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2,2'-oxybis(1-Chloropropane)	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
4-Methylphenol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
N-Nitroso-di-n-propylamine	3541B/8270C	ND or BKG	ug/kg	330	30-106	19	90
Hexachloroethane	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
nitrobenzene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Isophorone	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2-Nitrophenol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2,4-Dimethylphenol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Benzoic acid	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
Bis(2-Chloroethoxy)methane	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2,4-Dichlorophenol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90

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Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
1,2,4-Trichlorobenzene	3541B/8270C	ND or BKG	ug/kg	330	17-106	28	90
Benzyl alcohol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Hexachlorobutadiene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
4-Chloro-3-methylphenol	3541B/8270C	ND or BKG	ug/kg	330	33-113	16	90
Hexachlorocyclopentadiene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2,4,6-trichlorophenol	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2,4,5-trichlorophenol	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
2-Chloronaphthalene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2-Nitroaniline	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
Dimethylphthalate	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
3-Nitroaniline	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
2,4-Dinitrophenol	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
4-Nitrophenol	3541B/8270C	ND or BKG	ug/kg	1600	36-107	23	90
Dibenzofuran	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Diethylphthalate	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
4-Chlorophenylphenylether	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
2,6-Dinitroluene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
4-Nitroaniline	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
4,6-Dinitro-2-methylphenol	3541B/8270C	ND or BKG	ug/kg	1600	70-130	45	90
N-Nitrosodiphenylamine	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
4-Bromophenylphenylether	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
hexachlorobenzene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
pentachlorophenol	3541B/8270C	ND or BKG	ug/kg	1600	34-116	50	90
3,3'-Dichlorobenzidine	3541B/8270C	ND or BKG	ug/kg	660	70-130	45	90
Benzo(b)fluoranthene	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
4-Chloroaniline	3541B/8270C	ND or BKG	ug/kg	330	70-130	45	90
Pyrene	3541B/8270C	ND or BKG	ug/kg	330	31-126	26	90
PESTICIDES							
alpha-BHC	3540C/8081A	ND or BKG	ug/kg	1.00	70 - 130	30	90
beta-BHC	3540C/8081A	ND or BKG	ug/kg	1.00	60 - 130	30	90
delta-BHC	3540C/8081A	ND or BKG	ug/kg	1.00	60 - 130	30	90
gamma-BHC (lindane)	3540C/8081A	ND or BKG	ug/kg	1.00	38 - 153	30	90
Heptachlor	3540C/8081A	ND or BKG	ug/kg	1.00	60 -155	30	90
Aldrin	3540C/8081A	ND or BKG	ug/kg	1.00	48 - 140	30	90
Heptachlor epoxide	3540C/8081A	ND or BKG	ug/kg	1.00	60 - 120	30	90
Endosulfan I	3540C/8081A	ND or BKG	ug/kg	2.00	70 - 130	30	90
Dieldrin	3540C/8081A	ND or BKG	ug/kg	2.00	53 - 146	34	90
4,4'-DDE	3540C/8081A	ND or BKG	ug/kg	2.00	70 - 130	30	90
Endrin	3540C/8081A	ND or BKG	ug/kg	2.00	52 - 159	32	90
Endosulfan II	3540C/8081A	ND or BKG	ug/kg	2.00	70 - 130	30	90
4,4'-DDD	3540C/8081A	ND or BKG	ug/kg	2.00	70 - 130	30	90
Endosulfan sulfate	3540C/8081A	ND or BKG	ug/kg	2.00	70 - 130	30	90

TABLE 3-1
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Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
4,4'-DDT	3540C/8081A	ND or BKG	ug/kg	2.00	16 - 182	37	90
Methoxychlor	3540C/8081A	ND or BKG	ug/kg	10.00	70 - 130	30	90
Endrin ketone	3540C/8081A	ND or BKG	ug/kg	2.00	70 - 130	30	90
alpha-Chlordane	3540C/8081A	ND or BKG	ug/kg	1.00	70 - 130	30	90
gamma-Chlordane	3540C/8081A	ND or BKG	ug/kg	1.00	70 - 130	30	90
Toxaphene	3540C/8081A	ND or BKG	ug/kg	50.00	70 - 130	30	90
Endrin aldehyde	3540C/8081A	ND or BKG	ug/kg	2.00	50 - 130	30	90
PCBs							
Aroclor-1016	3540C/8082	ND or BKG	ug/kg	25	40 - 140	30	90
Aroclor-1221	3540C/8082	ND or BKG	ug/kg	40	50 - 150	30	90
Aroclor-1232	3540C/8082	ND or BKG	ug/kg	20	50 - 150	30	90
Aroclor-1242	3540C/8082	ND or BKG	ug/kg	20	50 - 150	30	90
Aroclor-1248	3540C/8082	ND or BKG	ug/kg	20	50 - 150	30	90
Aroclor-1254	3540C/8082	ND or BKG	ug/kg	20	40 - 120	30	90
Aroclor-1260	3540C/8082	ND or BKG	ug/kg	20	40 - 160	30	90
TAL METALS							
Aluminum	3050B/6010B	ND or BKG	mg/kg	10.00	46-109	30	90
Arsenic	3050B/6010B	ND or BKG	mg/kg	0.50	78-108	30	90
Barium	3050B/6010B	ND or BKG	mg/kg	2.00	76-109	30	90
Berylium	3050B/6010B	ND or BKG	mg/kg	0.50	73-117	30	90
Chromium	3050B/6010B	ND or BKG	mg/kg	1.00	57-126	30	90
Copper	3050B/6010B	ND or BKG	mg/kg	2.00	54-135	30	90
Lead	3050B/6010B	ND or BKG	mg/kg	0.50	48-130	30	90
Manganese	3050B/6010B	ND or BKG	mg/kg	1.00	70-130	30	90
Nickel	3050B/6010B	ND or BKG	mg/kg	2.00	70-116	30	90
Vanadium	3050B/6010B	ND or BKG	mg/kg	2.00	77-115	30	90
Silver	3050B/6010B	ND or BKG	mg/kg	1.00	69-108	30	90
Calcium	3050B/6010B	ND or BKG	mg/kg	50.00	70-130	30	90
Cadmium	3050B/6010B	ND or BKG	mg/kg	0.50	63-114	30	90
Cobalt	3050B/6010B	ND or BKG	mg/kg	2.00	77-114	30	90
Iron	3050B/6010B	ND or BKG	mg/kg	5.00	70-130	30	90
Potassium	3050B/6010B	ND or BKG	mg/kg	100.00	70-130	30	90
Magnesium	3050B/6010B	ND or BKG	mg/kg	50.00	70-130	30	90
Sodium	3050B/6010B	ND or BKG	mg/kg	100.00	70-130	30	90
Mercury	7471	ND or BKG	mg/kg	0.02	80-109	30	90
Antimony	3050B/6010B	ND or BKG	mg/kg	6.00	3-142	30	90
Selenium	3050B/6010B	ND or BKG	mg/kg	1.00	74-109	30	90
Thallium	3050B/6010B	ND or BKG	mg/kg	0.50	72-107	30	90
Vanadium	3050B/6010B	ND or BKG	mg/kg	2.00	77-115	30	90
Zinc	3050B/6010B	ND or BKG	mg/kg	1.00	57-132	30	90
EXPLOSIVES							
2,4,6-trinitrotoluene	8330	NA	mg/kg	0.25	65 - 140	30	90
2,4-dinitrotoluene	8330	NA	mg/kg	0.25	65 - 140	30	90

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
2,6-dinitrotoluene	8330	NA	mg/kg	0.25	65 - 140	30	90
2-amino-4,6-dinitrotoluene	8330	NA	mg/kg	1.00	50 - 150	30	90
2-nitrotoluene	8330	NA	mg/kg	0.25	60 - 140	30	90
3-nitrotoluene	8330	NA	mg/kg	0.25	65 - 130	30	90
4-amino--2,6-dinitrotoluene	8330	NA	mg/kg	1.00	35 - 160	30	90
4-nitrotoluene	8330	NA	mg/kg	0.25	70 - 130	30	90
HMX	8330	NA	mg/kg	1.00	55 - 130	30	90
m-dinitrobenzene	8330	NA	mg/kg	0.25	70 - 130	30	90
nitrobenzene	8330	NA	mg/kg	1.00	70 - 130	30	90
RDX	8330	NA	mg/kg	1.00	70 - 130	30	90
sym-trinitrobenzene	8330	NA	mg/kg	0.25	45 - 130	30	90
tetryl	8330	NA	mg/kg	1.00	30 - 130	30	90
WASTE CHARACTERIZATION - WIPE SAMPLES (FRAC Tank Walls)							
TAL METALS							
Aluminum	3050B/6010B	ND or BKG	mg/kg	10.00	46-109	30	90
Arsenic	3050B/6010B	ND or BKG	mg/kg	0.50	78-108	30	90
Barium	3050B/6010B	ND or BKG	mg/kg	2.00	76-109	30	90
Berylium	3050B/6010B	ND or BKG	mg/kg	0.50	73-117	30	90
Chromium	3050B/6010B	ND or BKG	mg/kg	1.00	57-126	30	90
Copper	3050B/6010B	ND or BKG	mg/kg	2.00	54-135	30	90
Lead	3050B/6010B	ND or BKG	mg/kg	0.50	48-130	30	90
Manganese	3050B/6010B	ND or BKG	mg/kg	1.00	70-130	30	90
Nickel	3050B/6010B	ND or BKG	mg/kg	2.00	70-116	30	90
Vanadium	3050B/6010B	ND or BKG	mg/kg	2.00	77-115	30	90
Silver	3050B/6010B	ND or BKG	mg/kg	1.00	69-108	30	90
Calcium	3050B/6010B	ND or BKG	mg/kg	50.00	70-130	30	90
Cadmium	3050B/6010B	ND or BKG	mg/kg	0.50	63-114	30	90
Cobalt	3050B/6010B	ND or BKG	mg/kg	2.00	77-114	30	90
Iron	3050B/6010B	ND or BKG	mg/kg	5.00	70-130	30	90
Potassium	3050B/6010B	ND or BKG	mg/kg	100.00	70-130	30	90
Magnesium	3050B/6010B	ND or BKG	mg/kg	50.00	70-130	30	90
Sodium	3050B/6010B	ND or BKG	mg/kg	100.00	70-130	30	90
Mercury	7471	ND or BKG	mg/kg	0.02	80-109	30	90
Antimony	3050B/6010B	ND or BKG	mg/kg	6.00	3-142	30	90
Selenium	3050B/6010B	ND or BKG	mg/kg	1.00	74-109	30	90
Thallium	3050B/6010B	ND or BKG	mg/kg	0.50	72-107	30	90
Vanadium	3050B/6010B	ND or BKG	mg/kg	2.00	77-115	30	90
Zinc	3050B/6010B	ND or BKG	mg/kg	1.00	57-132	30	90
WASTE CHARACTERIZATION - Bulk PPE, Staging Liners, Decon Pads							
METALS (Total)							
Aluminum	3050B/6010B	TBD	total ug	10.000	46-109	30	90

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Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Arsenic	3050B/6010B	TBD	total ug	0.500	78-108	30	90
Barium	3050B/6010B	TBD	total ug	2.000	76-109	30	90
Berylium	3050B/6010B	TBD	total ug	0.500	73-117	30	90
Chromium	3050B/6010B	TBD	total ug	1.000	57-126	30	90
Copper	3050B/6010B	TBD	total ug	2.000	54-135	30	90
Lead	3050B/6010B	TBD	total ug	0.500	48-130	30	90
Manganese	3050B/6010B	TBD	total ug	1.000	70-130	30	90
Nickel	3050B/6010B	TBD	total ug	2.000	70-116	30	90
Vanadium	3050B/6010B	TBD	total ug	2.000	77-115	30	90
Silver	3050B/6010B	TBD	total ug	1.000	69-108	30	90
Calcium	3050B/6010B	TBD	total ug	50.000	70-130	30	90
Cadmium	3050B/6010B	TBD	total ug	0.500	63-114	30	90
Cobalt	3050B/6010B	TBD	total ug	2.000	77-114	30	90
Iron	3050B/6010B	TBD	total ug	5.000	70-130	30	90
Potassium	3050B/6010B	TBD	total ug	100.000	70-130	30	90
Magnesium	3050B/6010B	TBD	total ug	50.000	70-130	30	90
Sodium	3050B/6010B	TBD	total ug	100.000	70-130	30	90
Mercury	7471	TBD	total ug	0.010	80-109	30	90
Antimony	3050B/6010B	TBD	total ug	6.000	3-142	30	90
Selenium	3050B/6010B	TBD	total ug	1.000	74-109	30	90
Thallium	3050B/6010B	TBD	total ug	0.500	72-107	30	90
Vanadium	3050B/6010B	TBD	total ug	2.000	77-115	30	90
Zinc	3050B/6010B	TBD	total ug	0.010	57-132	30	90
METALS (TCLP)							
Silver (TCLP)	1311/6010B	5.0	mg/L	0.030	50 - 150	20	90
Arsenic (TCLP)	1311/6010B	5.0	mg/L	0.300	50 - 150	20	90
Barium (TCLP)	1311/6010B	100	mg/L	0.060	50 - 150	20	90
Cadmium (TCLP)	1311/6010B	1.0	mg/L	0.015	50 - 150	20	90
Chromium (TCLP)	1311/6010B	5.0	mg/L	0.030	50 - 150	20	90
Mercury (TCLP)	1311/7470	0.2	mg/L	0.010	50 - 150	20	90
Lead (TCLP)	1311/6010B	5.0	mg/L	0.150	50 - 150	20	90
Selenium (TCLP)	1311/6010B	1.0	mg/L	0.30	50 - 150	20	90
PCBs[5]							
Aroclor-1016	3540C/8082	50000	ug/kg	25	40 - 140	30	90
Aroclor-1221	3540C/8082	50000	ug/kg	40	50 - 150	30	90
Aroclor-1232	3540C/8082	50000	ug/kg	20	50 - 150	30	90
Aroclor-1242	3540C/8082	50000	ug/kg	20	50 - 150	30	90
Aroclor-1248	3540C/8082	50000	ug/kg	20	50 - 150	30	90
Aroclor-1254	3540C/8082	50000	ug/kg	20	40 - 120	30	90
Aroclor-1260	3540C/8082	50000	ug/kg	20	40 - 160	30	90
PESTICIDES							
alpha-BHC	3540C/8081A	NA	ug/kg	1.00	70 - 130	30	90
beta-BHC	3540C/8081A	NA	ug/kg	1.00	60 - 130	30	90

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Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
delta-BHC	3540C/8081A	NA	ug/kg	1.00	60 - 130	30	90
gamma-BHC (lindane)	3540C/8081A	NA	ug/kg	1.00	38 - 153	30	90
Heptachlor	3540C/8081A	NA	ug/kg	1.00	60 -155	30	90
Aldrin	3540C/8081A	NA	ug/kg	1.00	48 - 140	30	90
Heptachlor epoxide	3540C/8081A	NA	ug/kg	1.00	60 - 120	30	90
Endosulfan I	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
Dieldrin	3540C/8081A	NA	ug/kg	2.00	53 - 146	34	90
4,4'-DDE	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
Endrin	3540C/8081A	NA	ug/kg	2.00	52 - 159	32	90
Endosulfan II	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
4,4'-DDD	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
Endosulfan sulfate	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
4,4'-DDT	3540C/8081A	NA	ug/kg	2.00	16 - 182	37	90
Methoxychlor	3540C/8081A	NA	ug/kg	10.00	70 - 130	30	90
Endrin ketone	3540C/8081A	NA	ug/kg	2.00	70 - 130	30	90
alpha-Chlordane	3540C/8081A	NA	ug/kg	1.00	70 - 130	30	90
gamma-Chlordane	3540C/8081A	NA	ug/kg	1.00	70 - 130	30	90
Toxaphene	3540C/8081A	NA	ug/kg	50.00	70 - 130	30	90
Endrin aldehyde	3540C/8081A	NA	ug/kg	2.00	50 - 130	30	90
PESTICIDES (TCLP)[4]							
Methoxychlor	1311/8150	10	mg/L	0.02	70 - 130	35	90
Endrin	1311/8150	0.02	mg/L	0.005	70 - 130	35	90
chlordane	1311/8150	0.03	mg/L	0.02	70 - 130	35	90
Heptachlor	1311/8150	0.008	mg/L	0.0025	70 - 130	35	90
lindane	1311/8150	0.4	mg/L	0.0025	70 - 130	35	90
Toxaphene	1311/8150	0.5	mg/L	0.1	70 - 130	35	90
HERBICIDES (TCLP)[4]							
2,4-D	1311/8150	10	mg/L	0.25	49 - 125	20	90
2,4,5-TP	1311/8150	1	mg/L	0.025	68 - 125	20	90
VOCs							
1,1,1-Trichloroethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
1,1,2,2-Tetrachloroethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
1,1,2-Trichloroethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
1,1-Dichloroethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
1,1-Dichloroethene	5030A/8260B	NA	ug/kg	5	59-172	22	90
1,2-Dichloroethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
1,2-Dichloropropane	5030A/8260B	NA	ug/kg	5	70-130	30	90
2-Chloroethyl Vinyl Ether (mixed)	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Acrylonitrile	5030A/8260B	NA	ug/kg	100	70-130	30	90
Allyl chloride	5030A/8260B	NA	ug/kg	50	70 - 130	30	90
Benzene	5030A/8260B	NA	ug/kg	5	66-142	21	90

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Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
Benzyl chloride	5030A/8260B	NA	ug/kg	10	70 - 130	30	90
Bromodichloromethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
Bromoform	5030A/8260B	NA	ug/kg	5	70-130	30	90
Bromomethane	5030A/8260B	NA	ug/kg	10	70-130	30	90
Carbon Disulfide	5030A/8260B	NA	ug/kg	5	70-130	30	90
Carbon Tetrachloride	5030A/8260B	NA	ug/kg	5	70-130	30	90
Chlorobenzene	5030A/8260B	NA	ug/kg	5	60-133	21	90
Chloroethane	5030A/8260B	NA	ug/kg	10	70-130	30	90
Chloroform	5030A/8260B	NA	ug/kg	5	70-130	30	90
Chloromethane	5030A/8260B	NA	ug/kg	10	70-130	30	90
cis-1,3-Dichloropropene	5030A/8260B	NA	ug/kg	5	70-130	30	90
Dibromochloromethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
Ethylbenzene	5030A/8260B	NA	ug/kg	5	70-130	30	90
2-Hexanone	5030A/8260B	NA	ug/kg	10	70-130	30	90
Methylene Chloride	5030A/8260B	NA	ug/kg	5	70-130	30	90
4-Methyl-2-pentanone	5030A/8260B	NA	ug/kg	10	70-130	30	90
Styrene	5030A/8260B	NA	ug/kg	5	70-130	30	90
Tetrachloroethene	5030A/8260B	NA	ug/kg	5	70-130	30	90
Toluene	5030A/8260B	NA	ug/kg	5	59-139	21	90
trans-1,2-Dichloroethene	5030A/8260B	NA	ug/kg	5	70-130	30	90
trans-1,3-Dichloropropene	5030A/8260B	NA	ug/kg	5	70-130	30	90
Trichloroethylene	5030A/8260B	NA	ug/kg	5	62-137	24	90
Trichlorofluoromethane	5030A/8260B	NA	ug/kg	5	70-130	30	90
Vinyl Acetate	5030A/8260B	NA	ug/kg	10	70-130	30	90
Vinyl Chloride	5030A/8260B	NA	ug/kg	10	70-130	30	90
Xylene (total)	5030A/8260B	NA	ug/kg	5	70-130	30	90
VOCs (TCLP)[4]							
Benzene	1311/8260B	0.5	mg/L	0.05	76-127	11	90
Carbon Tetrachloride	1311/8260B	0.5	mg/L	0.05	70-130	30	90
Chlorobenzene	1311/8260B	100	mg/L	0.05	75-130	13	90
Chloroform	1311/8260B	6	mg/L	0.05	70-130	30	90
1,2-Dichloroethane	1311/8260B	0.5	mg/L	0.05	70-130	30	90
1,1-Dichloroethene	1311/8260B	0.7	mg/L	0.05	61-145	14	90
methyl ethyl ketone	1311/8260B	200	mg/L	0.1	70-130	30	90
Tetrachloroethene	1311/8260B	0.7	mg/L	0.05	70-130	30	90
Trichloroethylene	1311/8260B	0.5	mg/L	0.05	71-120	14	90
Vinyl Chloride	1311/8260B	0.2	mg/L	0.1	70-130	30	90
SVOCs (TOTAL)							
2,4-Dinitrotoluene	3541B/8270C	NA	ug/kg	330	33-95	20	90

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs		
					Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
2-Methylnaphthalene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Acenaphthene	3541B/8270C	NA	ug/kg	330	30-109	17	90
Acenaphthylene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Anthracene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(a)anthracene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(a)pyrene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(b)fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(g,h,i)perylene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzo(k)fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Bis(2-ethylhexyl)phthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Butylbenzylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Chrysene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Di-n-butylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Di-n-octylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
Dibenzo(a,h)anthracene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Fluorene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Indeno(1,2,3-cd)pyrene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Naphthalene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Phenanthrene	3541B/8270C	NA	ug/kg	330	70-130	45	90
phenol	3541B/8270C	NA	ug/kg	330	20-132	25	90
Bis(2-Chloroethyl)ether	3541B/8270C	NA	ug/kg	330	70-130	45	90
2-Chlorophenol	3541B/8270C	NA	ug/kg	330	20-132	16	90
1,2-dichlorobenzene	3541B/8270C	NA	ug/kg	330	12-99	45	90
1,3-Dichlorobenzene	3541B/8270C	NA	ug/kg	330	70-130	45	90
1,4-Dichlorobenzene	3541B/8270C	NA	ug/kg	330	70-130	31	90
2-Methylphenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
2,2'-oxybis(1-Chloropropane)	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Methylphenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
N-Nitroso-di-n-propylamine	3541B/8270C	NA	ug/kg	330	30-106	19	90
Hexachloroethane	3541B/8270C	NA	ug/kg	330	70-130	45	90
nitrobenzene	3541B/8270C	NA	ug/kg	330	70-130	45	90
Isophorone	3541B/8270C	NA	ug/kg	330	70-130	45	90
2-Nitrophenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
2,4-Dimethylphenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
Benzoic acid	3541B/8270C	NA	ug/kg	1600	70-130	45	90
Bis(2-Chloroethoxy)methane	3541B/8270C	NA	ug/kg	330	70-130	45	90
2,4-Dichlorophenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
1,2,4-Trichlorobenzene	3541B/8270C	NA	ug/kg	330	17-106	28	90
Benzyl alcohol	3541B/8270C	NA	ug/kg	330	70-130	45	90
Hexachlorobutadiene	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Chloro-3-methylphenol	3541B/8270C	NA	ug/kg	330	33-113	16	90
Hexachlorocyclopentadiene	3541B/8270C	NA	ug/kg	330	70-130	45	90

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

					DQOs		
Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	Accuracy (% R)	Precision (% RSD)	Completeness (% Valid Data)
2,4,6-trichlorophenol	3541B/8270C	NA	ug/kg	330	70-130	45	90
2,4,5-trichlorophenol	3541B/8270C	NA	ug/kg	1600	70-130	45	90
2-Chloronaphthalene	3541B/8270C	NA	ug/kg	330	70-130	45	90
2-Nitroaniline	3541B/8270C	NA	ug/kg	1600	70-130	45	90
Dimethylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
3-Nitroaniline	3541B/8270C	NA	ug/kg	1600	70-130	45	90
2,4-Dinitrophenol	3541B/8270C	NA	ug/kg	1600	70-130	45	90
4-Nitrophenol	3541B/8270C	NA	ug/kg	1600	36-107	23	90
Dibenzofuran	3541B/8270C	NA	ug/kg	330	70-130	45	90
Diethylphthalate	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Chlorophenylphenylether	3541B/8270C	NA	ug/kg	330	70-130	45	90
2,6-Dinitroluene	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Nitroaniline	3541B/8270C	NA	ug/kg	1600	70-130	45	90
4,6-Dinitro-2-methylphenol	3541B/8270C	NA	ug/kg	1600	70-130	45	90
N-Nitrosodiphenylamine	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Bromophenylphenylether	3541B/8270C	NA	ug/kg	330	70-130	45	90
hexachlorobenzene	3541B/8270C	NA	ug/kg	330	70-130	45	90
pentachlorophenol	3541B/8270C	NA	ug/kg	1600	34-116	50	90
3,3'-Dichlorobenzidine	3541B/8270C	NA	ug/kg	660	70-130	45	90
Benzo(b)fluoranthene	3541B/8270C	NA	ug/kg	330	70-130	45	90
4-Chloroaniline	3541B/8270C	NA	ug/kg	330	70-130	45	90
Pyrene	3541B/8270C	NA	ug/kg	330	31-126	26	90
SVOCs (TCLP)[4]							
1,4-dichlorobenzene	1311/8270B	7.5	mg/L	0.10	10-125	40	90
hexachloroethane	1311/8270B	3	mg/L	0.10	10-125	40	90
hexachloro-1,3-butadiene	1311/8270B	0.5	mg/L	0.10	10-125	40	90
hexachlorobenzene	1311/8270B	0.13	mg/L	0.10	10-125	40	90
O-cresol (2-Methylphenol)	1311/8270B	200	mg/L	0.10	10-125	40	90
M-cresol (3-Methylphenol)	1311/8270B	200	mg/L	0.20	10-125	40	90
P-cresol (4-Methylphenol)	1311/8270B	200	mg/L	0.20	10-125	40	90
Cresol	1311/8270B	200	mg/L	0.20	10-125	40	90
2,4-Dinitrotoluene	1311/8270B	0.13	mg/L	0.10	10-125	40	90
nitrobenzene	1311/8270B	2	mg/L	0.10	10-125	40	90
pentachlorophenol	1311/8270B	100	mg/L	0.50	10-125	40	90
pyridine	1311/8270B	5	mg/L	1.00	10-125	40	90
2,4,5-trichlorophenol	1311/8270B	400	mg/L	0.50	10-125	40	90
2,4,6-trichlorophenol	1311/8270B	2	mg/L	0.10	10-125	40	90
MISCELLANEOUS	SW846						
REACTIVITY[6]							
Reactive Cyanide	7.3.3.2	non-reactive	mg/kg	0.5	0-100	20	90
Reactive Sulfide	7.3.4.2	non-reactive	mg/kg	170	10-80	20	90
IGNITABILITY[6]	1010	>60	°C	NA	80-120	10	90

TABLE 3-1
Laboratory Analysis Methods and Data Quality Objectives
Seneca Army Depot Activity OB Grounds Remediation

Analytes of Concern	Method[1]	Regulatory Disposal Criteria[2]	Units	PQL	DQOs Accuracy (% R)	DQOs Precision (% RSD)	DQOs Completeness (% Valid Data)
CORROSIVITY[6]	9045A	250	mg/kg	NA	NA	10	90
PERCENT MOISTURE	2540G	<80	%	0.1	NA	20	90
pH	9045C	2 - 12.5	pH units	NA	NA	10	90

Reference: CENAE Methods Compendium v.1.1

1. Method numbers taken from SW-846 (EPA, 1986, and revisions) for soil matrix

2. "Regulatory Disposal Criteria" represents either specific limits required for acceptance of material into the landfill, or on site acceptance criteria for excavation limits, clean fill material and discharge of treated water

3. Cleanup goal established in design.

4. Analytes and regulatory levels based on TCLP criteria (Table 1 of 40 CFR 11804 and 11815-11816, March1990)

5. Individual Arochlors must be <50 mg/kg and total of all arochlors must be below 50 mg/kg.

6. Waste cannot be characteristically hazardous waste per 40 CFR 261.

7. The PQL for these parameters is higher than the regulatory discharge criteria. Appropriate concentrations will be made in order to obtain PQLs below the discharge criteria.

NA No specific landfill acceptance criterion has been established. Landfill to review data on case by case basis.

NLE No level established in project specifications. Limits to be determined during discharge permitting process.

ND or BKG Clean fill contaminant levels not established in specifications. WESTON assumes levels will be non-detect or background.

Notes: Reporting limits may vary depending on sample size/volume, dilution factors, dry weight reporting (soils), etc.

Precision and accuracy limits are based on the laboratory's internal statistical values and are subject ot change based on updates to the database.

mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
mg/l = milligrams per liter
mg/m^3 = milligrams per cubic meter

SECTION 4

SAMPLING LOCATIONS AND PROCEDURES

4. SAMPLING LOCATIONS AND PROCEDURES

Sampling locations, rationale, and methods are discussed in Section 4 of the FSP. Table 4-1 in the FSP provides a summary of the samples that will be collected during this project.

SECTION 5

SAMPLE CUSTODY AND HOLDING TIMES

5. SAMPLE CUSTODY AND HOLDING TIMES

Sample holding times are listed in Table 6-1 of this QAPP. Sample custody and documentation procedures are located in Section 5 of the FSP.

SECTION 6

ANALYTICAL PROCEDURES

6. ANALYTICAL PROCEDURES

The following sections summarize the analytical procedures for the primary laboratory, Ecology and Environment Inc., Lancaster, NY. For complete details, refer to the Standard Operating Procedures (SOP) to be submitted at a later date.

6.1 ANALYTICAL METHODS

Ecology and Environment Inc. maintains certification with U.S. Army Corps of Engineers for the analytical parameters required for this project. This certification is valid through 30 January 2000.

Routine analytical services are performed using standard EPA-approved methodologies subject to USACE approval, where applicable. In some cases, modification of standard methods may be necessary to provide accurate and precise analysis of particularly complex matrices. When modifications to standard analytical methods are performed, the specific alterations, as well as the reason for the change, will be communicated to the WESTON Project Manager who will inform the USACE Project Manager. The modifications will be reported with the results of the analysis.

The choice of analytical method is determined by the type of samples and the project requirements. The laboratory's reporting limits are based on program requirements and sample matrix. Individual sample reporting limits may vary from the laboratory's routine reporting limits due to dilution requirements, variability in sample weight or volume used to perform the analysis, dry weight adjustment for solid samples, the presence of analytical background contaminants, or other sample- or analysis-related conditions. The selected analytical methods and reporting limits are shown in Table 3-1. The sample containers, preservation methods, and maximum holding times are detailed in Table 6-1.

TABLE 6-1
Seneca Army Depot Activity OB Grounds Remediation
Sample Containers, Preservatives, and Holding Times

Matrix	Parameter	Container^a	Preservation/ Solvents	Maxium Holding Times Extraction	Analysis
Soil, Sediment, and Stabilized Soil Stockpiles					
Soil	Lead(Total)	either glass or plastic may be used, 8oz.	Ice to 4°C		6 mos.; except Hg, within 28 days
Soil	Metals(TCLP)	One 500-mL glass	Ice to 4°C	See Note^b	
Soil	Full TCLP	One 500-mL glass	Ice to 4°C	See Note^b	
Site Perimeter Samples					
Soil	Lead(Total)	either glass or plastic may be used, 8oz.	Ice to 4°C		6 mos.; except Hg, within 28 days
Untreated and Stabilized Soil Characterization					
Soil	IRC	(combined w/Metals)	Ice to 4°C	—	14 days
Soil	percent moisture	(combined w/Metals)			
Soil	paint filter	(combined w/Metals)			
Soil	pH	(combined w/Metals)			
Soil	Explosives	(combined w/Metals)			
Soil	VOC,	CG(1x2oz.) Wide mouth, full	Ice to 4°C		14 days
Soil	SVOC	AG(1X4oz.) Wide mouth, full	Ice to 4°C	14 days	Analyze within 40 days of extraction
Soil	Metals (RECRA 8)	One 8-oz. glass	Ice to 4°C		6 mos.; except Hg, within 28 days
Soil	Full TCLP	One 8-oz. glass	Ice to 4°C	See Note^b	
Soil	PEST	(combined w/TCLP)	Ice to 4°C	14 days	40 days
Soil	PCB	(combined w/TCLP)	Ice to 4°C	14 days	40 days
Bench Verification					
Soil	Lead(TCLP)	One 500-mL glass	Ice to 4°C	See Note^b	
Bulk PPE Samples					
Solid	IRC	One 8-oz. glass	Ice to 4°C	—	14 days
Solid	percent moisture	(combined w/IRC)			
Solid	pH	(combined w/IRC)			
Solid	VOC	CG(1x2oz.) Wide mouth, full	Ice to 4°C		14 days
Solid	SVOC	AG(1X4oz.) Wide mouth, full	Ice to 4°C	14 days	Analyze within 40 days of extraction
Solid	Full TCLP	One 8-oz. glass	Ice to 4°C	See Note^b	
Solid	PEST	(combined w/TCLP)	Ice to 4°C	14 days	40 days
Solid	PCB	(combined w/TCLP)	Ice to 4°C	14 days	40 days
Staging Liner Samples					
Solid	IRC	(combined w/Metals)	Ice to 4°C	—	14 days
Solid	percent moisture	(combined w/Metals)			
Solid	pH	(combined w/Metals)			
Solid	VOC	CG(1x2oz.) Wide mouth, full	Ice to 4°C		14 days
Solid	SVOC	AG(1X4oz.) Wide mouth, full	Ice to 4°C	14 days	40 days
Solid	Metals (RECRA 8)	One 8-oz. glass	Ice to 4°C	Digest and Analyze within 6 months	
Solid	Full TCLP	One 8-oz. glass	Ice to 4°C	See Note^b	
Solid	PEST	(combined w/TCLP)	Ice to 4°C	14 days	40 days
Solid	PCB	(combined w/TCLP)	Ice to 4°C	14 days	40 days

TABLE 6-1
Seneca Army Depot Activity OB Grounds Remediation
Sample Containers, Preservatives, and Holding Times

Matrix	Parameter	Container[a]	Preservation/ Solvents	Maxium Holding Times	
				Extraction	Analysis
Staging Area Samples/Haul Road Samples					
Soil	Lead(Total)	either glass or plastic may be used, 8oz.	Ice to 4°C	Digest and Analyze within 6 months	
Holding Tank Samples					
Wipes	TAL Metals	Two 125-mL glass (separate container for mercury)	Ice to 4°C: DI Water		
Waste Water Effluent					
Aqueous	TAL Metals	1L plastic	Ice to 4°C. HNO_3 to pH < 2	Digest and Analyze within 6 months; except Hg, within 28 days	
Aqueous	Cyanide	1L plastic	Na_2SO_4		
Aqueous	Explosives	1L AG			
Aqueous	Total Diss. Solids	1L plastic			
Aqueous	pH	1L plastic			
Confirmation Soil Samples - Excavation Areas					
Soil	Lead(Total)	One 8 oz. or 4 oz. glass	Ice to 4°C		6 mos.; except Hg, within 28 days
Clean Fill Samples					
Soil	TAL Metals	One 8-oz. glass	Ice to 4°C		6 mos.; except Hg, within 28 days
Soil	Explosives	(combined w/Metals)			
Soil	VOC	CG(1x2oz.) Wide mouth, full	Ice to 4°C		14 days
Soil	SVOC	AG(1X4oz.) Wide mouth, full	Ice to 4°C	14 days	Analyze within 40 days of extraction
Soil	PCB	(combined w/Metals)	Ice to 4°C	14 days	40 days
Soil	PEST	(combined w/Metals)	Ice to 4°C	14 days	40 days
Air/Dust Samples					
Filter	Lead (total)	plastic bag	—	Digest and Analyze within 6 months	

[a] MS/MSD sample volume requirements: solid samples - no additional sample volume is required if only one test is requested. If multiple tests are requested from the same container, collect double volume. Liquid and wipe samples - triple the sample volume is required for all parameters.

[b] TCLP Holding Times:

VOCs: TCLP - 14 days, Analysis - 14 days (from TCLP prep).
Extractable Organics: TCLP - 14 days, Preparation - 7 days, Analysis - 40 days (from TCLP prep).
Mercury: TCLP - 28 days, Analysis - 28 days (from TCLP prep).
Metals (excluding mercury): TCLP - 180 days, Analysis - 180 days (from TCLP prep).

IRC = Ignitability, Reactivity, Corrosivity
PCBs = Polychlorinated biphenyls
SVOCs = Semivolatile Organic Compounds
TBD = To Be Determined
TCLP = Toxicity characteristic leaching procedure
VOC = Volatile organic compound
CG = Clear Glass
AG = Amber Glass

Additional Notes:

1. "Solid" matrix samples (i.e. PPE and other debris) can be placed in plastic bags if the sample does not fit into a jar.
2. Basic extraction volumes required for solid samples: PCBs - 30 grams, SVOCs - 30 grams, PCB/Pests - 30 grams, metals (1 or all elements, plus silica) - 4 grams, TCLP (1 or all fractions) 300 grams.

SECTION 7

CALIBRATION PROCEDURES AND FREQUENCY

7. CALIBRATION PROCEDURES AND FREQUENCY

Before any instrument is used as a measurement device on samples, the instrumental response to known reference materials must be determined. The manner in which various instruments are calibrated is dependent on the particular type of instrument and its intended use. All sample measurements are made within the calibrated range of the instrument. Preparation of all reference materials used for calibration will be documented in a bound notebook.

Instrument calibration typically consists of two types: initial calibration and continuing calibration. Initial calibration procedures establish the calibration range of the instrument and determine instrument response over that range. Typically, three to five analyte concentrations are used to establish instrument response over a concentration range. The instrument response over the range is generally absorbance, peak height, etc., which can be expressed as a linear model with a correlation coefficient (e.g., for atomic absorption and inductively coupled plasma) or as a response factor or amount versus response plot (e.g., for gas chromatography/mass spectrometry).

Continuing calibration usually includes measurement of the instrument response to fewer calibration standards and requires instrument response to compare with certain limits (e.g., ± 10%) of the initial measured instrument response. Continuing calibration may be used within an analytical sequence to verify stable calibration throughout the sequence and/or to demonstrate that instrument response did not drift during a period of non-use of the instrument.

7.1 ANALYTICAL SUPPORT AREAS

7.1.1 Standard and Reagent Preparation

Standards are obtained from commercial vendors as neat materials, single or multi-analyte stock solutions, or ready-to-use solutions. Actual preparation requirements vary with each analytical method, and are detailed in the respective analytical SOPs. Sources may vary depending on availability of mixes and solutions from vendors. Each production unit is responsible to ensure, when available, that all standards are traceable to EPA, National Institute of Standards and Technology (NIST), American Association for Laboratory Accreditation (AALA), Standard Analytical Reference Materials (SARMs), or other equivalent certified material sources, or that an alternate source standard is used to verify reference materials.

7.1.2 Balances

Laboratory balances will be calibrated and serviced annually by a factory representative. In addition, the analyst will check the balance with three weighings before each use: one in the gram range, one in the milligram range and a combined reading of both weights. A record of calibrations and daily checks will be kept in the balance log.

The Class S weights used by the analysts for daily balance checks are re-calibrated annually.

7.1.3 Refrigerators, Freezers, and Ovens

Oven and refrigerator thermometers are calibrated annually against a NIST-certified thermometer in the range of interest. Annual calibrations are recorded in a calibration notebook. Daily readings are recorded with the respective oven or refrigerator.

7.1.4 Water Supply System

The laboratory's on-tap laboratory pure water supply is tested daily for pH and specific conductivity. Additionally, samples of the water supply are routinely collected and analyzed for metals.

7.2 LABORATORY INSTRUMENTS

Specific instrument calibration procedures for various instruments will be included with the laboratory SOPs to be submitted at a later date.

SECTION 8

INTERNAL QC CHECKS

8. INTERNAL QC CHECKS

The daily quality of analytical data generated at Ecology and Environment Inc. is controlled by the implementation of a laboratory-specific Quality Assurance/Quality Control (QA/QC) Plan. This plan will be submitted at a later date with the laboratory SOPs. The types of internal QC checks are described in the following subsections.

8.1 BATCH QC

Sample preparation or pre-treatment is commonly required before analysis. Typical preparation steps include homogenization, grinding, soxhlet extraction, acid digestion, distillation, and concentration. During these pre-treatment steps, samples are arranged in discrete manageable groups referred to as Preparation (Prep) Batches. Prep batches provide a means to control variability in sample treatment.

QC indicators are added to each prep batch to monitor method performance. These QC Prep Batch Indicators are as follows:

- Method Blanks: Method blanks usually consist of laboratory reagent-grade water treated in the same manner as the sample (e.g., digested, extracted, distilled, etc.), which is then analyzed and reported as a standard sample would be.
- Blank Spike (BS): A BS is a sample of laboratory reagent-grade water fortified (spiked) with the analytes of interest, which is prepared and analyzed with the associated sample batch. BS is performed for organic analysis only.
- Laboratory Control Sample (LCS) (Inorganics): This is a standard solution with a certified concentration which is analyzed as a sample and is used to monitor analytical accuracy. (Equivalent to a method blank spike.)

8.2 MATRIX SPECIFIC QC

Matrix QC indicators help monitor for potential physical and chemical effects which may interfere with the precision and/or accuracy of the selected analytical method. Since interferences can enhance or mask the presence of target analytes, matrix QC indicators measure the degree of interference and are used to assist in the interpretation of the analytical results. The laboratory avoids performing matrix QC on known field blank samples, such as trip blanks and rinsates, since these samples are not indicative of the sample matrix. Matrix QC indicators are analyzed when requested by the client or specified by the method.

The matrix specific QC indicators are as follows:

- Laboratory Duplicate Sample (Inorganics): Duplicate samples are obtained by splitting a field sample into two separate aliquots and performing two separate analyses on the aliquots. The analysis of laboratory duplicates monitors sample precision; however, it may be affected by sample non-homogeneity, particularly in the case of non-aqueous samples.

- Matrix Spike (Inorganics): A matrix spike is an aliquot of an investigative sample which is fortified (spiked) with the analytes of interest and analyzed with an associated sample batch to monitor the effects of the investigative sample matrix (matrix effects) on the analytical method.

- Matrix Spike (MS)/MS Duplicate (MSD) (Organics): MS/MSD samples are an aliquot of an investigative sample which is fortified (spiked) with the analytes of interest and analyzed with an associated sample batch to monitor the effects of the investigative sample matrix (matrix effects) on the analytical method. MS/MSDs are performed for organic analysis and only in association with selected protocols. MS/MSD precision should fall within the limits specified in Table 3-1.

- Surrogates: Surrogates are used in all GC and GC/MS analyses. Every blank, standard and environmental samples will be spiked with surrogate compounds prior to purging volatiles or extracting semi-volatiles.

- Known QC Check Sample: This is a QC sample of known concentration obtained from the U.S. EPA, the National Institute of Standards and Technology (NIST), or a commercial source. This QC sample is to check the accuracy of an analytical procedure. It is particularly applicable when a minor revision or adjustment has been made to an analytical procedure or instrument.

SECTION 9

CALCULATION OF DATA QUALITY INDICATORS

9. CALCULATION OF DATA QUALITY INDICATORS

The objective of this QAPP is to provide a framework to ensure that all analytical data reported are of known quality.

To assure that the data generated are of a known and acceptable level of quality, this plan establishes or makes provisions for:

- Developing performance standards related to various elements of the sampling plan.
- Monitoring actual performance in comparison to and in compliance with the established standards.
- Reporting the monitored performance.
- Rectifying performance not conforming to the established standards.

All QA/QC assessments made during this effort will be performed using a matrix representative of the sample matrix and conditions being measured whenever possible. The data will be calculated and reported in units consistent with standard reporting conventions to enable comparability to existing data, standards, and/or regulatory action limits.

9.1 PRECISION

Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Various measures of precision exist depending on the "prescribed similar conditions".

Analytical precision is calculated by expressing, as a percentage, the difference between results of analyses of duplicate samples for a given analyte. Precision can be expressed as a RPD by the formula:

$$RPD = \frac{|X_1 - X_2|}{(X_1 - X_2)/2} \times 100\%$$

where:

X_1 = Concentration of analyte in sample.

X_2 = Concentration of analyte in replicate.

The results of field duplicate samples analyses will be a means for assessing precision.

9.2 ACCURACY

Accuracy is a measure of the bias in a system or the degree of agreement of the measurement of a spiked sample with the quantity of the spike. Accuracy is usually expressed as a percent of the difference between the spiked sample (XS) and unspiked sample (XU) divided by the quantity of the spike (K) as shown by the formula:

$$\text{Accuracy} = \text{Percent Recovery} = \frac{X_S - X_U}{K} \times 100\%$$

where:

X_S = Measured value of the spiked sample

X_U = Measured value of the unspiked sample

K = Known amount of the spike in the sample

Results of MS/MSD analyses will be used as a means for assessing analytical accuracy. Surrogate compounds will be used to assess accuracy for organic analyses.

9.3 COMPLETENESS

Completeness is a measure of the relative number of analytical data points that meet all the acceptance criteria for accuracy, precision, and any other criteria required by the specific analytical methods used. The level of completeness can also be affected by loss or breakage of samples during transport, as well as external problems that prohibit collection of the sample.

The ability to meet or exceed completeness objectives is dependent on the nature of samples submitted for analysis. For example, if the analytical methods proposed for use (particularly for organics analyses) are intended for analysis of environmental samples of low and medium hazard, the applicability of these methods to non-routine matrices such as drum samples, wipes, air samples. etc., may result in poor method performance and, therefore, adversely impact achievement of the data completeness goal.

Laboratory completeness should be 95%. Completeness (%C) will be calculated by WESTON using the following formula:

$$\%C = \frac{V}{N} \times 100\%$$

where:

V = Number of sample measurements considered valid

N = Number of valid measurements needed to achieve a specified statistical level of confidence

9.4 REPRESENTATIVENESS

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter, variation at a sampling point, a process condition, or an environmental condition. WESTON will ensure representativeness by following SOPs for sample collection and analysis and will ensure homogeneity of the environmental samples. Sample containers for matrices to be collected will be filled in the following order: VOCs, organic parameters, and inorganic parameters.

9.5 COMPARABILITY

Comparability expresses the confidence with which one data set can be compared to another. The comparability of the data is influenced by sampling and analytical procedures. By providing specific protocols to be used for obtaining and analyzing samples, data sets should be comparable, regardless of who obtained the sample or performed the analysis; however, WESTON will designate one person to be responsible for sample collection and handling so that introduction of errors will be kept to a minimum. Analytical comparability will be ensured by using standardized analytical procedures.

9.6 DETECTION LIMITS

9.6.1 Method Detection Limits

The method detection limit (MDL) is the lowest concentration that can be measured for a given analytical method and sample matrix with a 99% confidence that the analyte is present. The MDL is determined according to Appendix B of 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants". MDLs reflect a calculated (statistical) value determined under ideal laboratory conditions in a clean matrix, and may not be achievable in all environmental matrices. The laboratory maintains MDL studies for analyses performed; these are verified at least annually.

9.6.2 Instrument Detection Limits

Instrument Detection Limits (IDLs) are generated for each element by the metals laboratory quarterly for each instrument specified in CLP. These limits are used to gauge instrument sensitivity and when routinely evaluated, instrument performance without the introduction of method variance can be determined.

9.6.3 Reporting Limits

Reporting limits are defined as the lowest concentration of an analyte determined by a given method in a given matrix that the laboratory feels can be reported with an acceptable quantitative error or client requirements, values specified by the EPA methods or other project and client requirements. Because of the high level of quantitative error associated with determinations at the level of the MDL, reporting levels are usually higher than the MDL. Wherever possible, reporting is limited to values approximately 3 to 5 times the respective MDL to ensure confidence in the reported value.

Laboratory reporting limits for analyses are listed in Table 3-1.

SECTION 10

CORRECTIVE ACTIONS

10. CORRECTIVE ACTIONS

10.1 FIELD CORRECTIVE ACTION

Field personnel have initial responsibility for monitoring the quality of field measurements and observations. The Site Manager will notify the Site QC Officer and QC Management of any problems that occur that may jeopardize the integrity of the project or cause any project objective to not be met. An appropriate corrective action will be developed and implemented. The project engineer will document the problem, including the cause, the corrective action, and results in the field logbook. Copies of the logbook will be provided to the Project Manager, Site QC Officer, and QC Management.

10.2 LABORATORY CORRECTIVE ACTION

The analyst has initial responsibility to monitor the quality of an analytical system. The analyst will verify that all laboratory-specific QC procedures are followed and results of an analysis of QC samples are within acceptance criteria. This requires that the analyst assess the correctness of all of the following items as appropriate:

- Sample preparation procedure.
- Initial calibration.
- Calibration verification.
- Method blank result.
- Laboratory control standard.
- Duplicate analysis.
- Fortified sample result.
- MS/MSD and surrogate recoveries.

If the assessment reveals that any of the laboratory-specific QC acceptance criteria are not met, the analyst must immediately assess the analytical system to correct the problem. The analyst notifies the appropriate supervisor and laboratory QA coordinator of the problem and, if possible, identifies potential causes and corrective action.

The nature of the corrective action obviously depends on the nature of the problem. For example, if continuing calibration verification is determined to be "out of control," the corrective action may require recalibration of the analytical system and reanalysis of all samples since the last acceptable continuing calibration standard.

When the appropriate corrective action measures have been defined and the analytical system is determined to be "in control," the analyst documents the problem and the corrective action. Data generated concurrently with an "out-of-control" system will be evaluated for usability in light of the nature of the deficiency. If the deficiency does not impair the usability of the results, data will be reported and the deficiency noted in the case narrative. Where sample results are impaired, the laboratory QA coordinator is notified and appropriate corrective action (e.g., reanalysis, etc.) is taken. If reanalysis cannot be conducted, re-sampling may be required.

SECTION 11

DATA REDUCTION, VALIDATION, AND REPORTING

11. DATA REDUCTION, VALIDATION, AND REPORTING

Analytical data are recorded on pre-formatted bench sheets or analysis run logs in bound laboratory notebooks. These bound notebooks are issued and controlled by the laboratory's Quality Assurance Section. A unique document control code is assigned to each book to assure that chronological record keeping is maintained.

Analytical data is referenced to a unique sample identification number (RFW #) for internal tracking and reporting. Notebook pages contain the following information, as applicable: analytical method, analyst, date, sequential page number, associated RFW sample numbers, standard concentrations, instrument settings, and raw data. Entries for instrument logs are in chronological order and maintained so as to enable reconstruction of the analytical sequence.

The laboratory analyst is responsible for recording all appropriate information into analytical logs, and for signing and dating all analytical book entries daily. The notebook pages are reviewed by a supervisor or trained data reviewer. Copies of instrument outputs (chromatograms, strip charts, etc.) are maintained on file with the analyst's signature/initials and date.

11.1 DATA REDUCTION

Data reduction is performed by the analyst and consists of calculating concentrations in samples from the raw data. The complexity of the data reduction depends on the analytical method and the number of discrete operations involved (e.g., extractions, dilutions, instrument readings and concentrations). The analyst calculates the final results from the raw data or uses appropriate computer programs to assist in the calculation of final reportable values. Copies of all raw data and the calculations used to generate the final results, such as bound laboratory notebooks, strip-charts, chromatograms, LOTUS spreadsheets and LIMS record files, are retained on file for a minimum of six years.

Calculations and data reduction steps for various methods are summarized in the laboratory SOPs or program requirements.

11.2 DATA REVIEW

System reviews are performed at all levels. The individual analyst continually reviews the quality of data through calibration checks, quality control sample results, and performance evaluation samples. Data review is initiated by the analyst during, immediately following, and after the completed analysis. The analyst uses a data review checklist to verify that all analytical criteria have been met. This checklist provides a list of items to verify that all analytical specifications have been achieved. Any out-of-control items are documented on the checklist and verbally communicated to the Unit Leader or Section Manager for review and response.

A secondary review of the data is performed by the supervisor, analyst or data specialist. The peer reviewer is instructed by the QA Section, Section Manager or Unit Leader to perform the data review. After these first two reviews are completed. the data is entered into the LIMS.

The Section Manager or designee reviews the data for precision and accuracy to assure that it meets all specifications. After approval by the Section Manager or designee, the analytical report is assembled. The Section Manager or the Laboratory Project Manager designee reviews the data to ensure consistency with laboratory QC requirements, to verify reasonableness with other generated data, and to determine if program requirements have been satisfied. Selected hard copy output of data (chromatograms, spectra, etc.) will be reviewed to ensure that results are interpreted correctly. The final report is signed by the Section Manager, Project Manager and Laboratory Manager.

Unusual or unexpected results will be reviewed and a resolution of the problem will be documented in a Corrective Action Report (CAR). If suspect data is reported, the out-of-control events will be addressed in a case narrative. Copies of the CARs may be included in a data package as needed.

Prior to final review/sign off by the Laboratory Manager or designee, the Data Reporting Section will verify that the report is compiled in the proper format. The Laboratory Manager or designee provide the final laboratory review prior to reporting the results to the client. The PM will do a final completeness check before submitting the data report to the client.

The Quality Assurance Section independently conducts a review of selected reports to determine if laboratory and client quality assurance/quality control requirements have been met. Discrepancies will be reported to the appropriate Section Manager and/or Laboratory Project Manager for resolution.

Data audits are also performed by regulatory agencies or client representatives. The frequency, level of detail, and the areas of concern during these reviews are dependent on the specific program requirements.

11.3 DATA VALIDATION

The validation procedures to be employed will consist of the following activities:

- Review of chain-of-custody documents to verify sample identities;
- Review of sample log-in documents to verify any potential problems with custody seals, container integrity, sample preservation, labeling, etc.;
- Review of trip blank data to identify any potential problems with sample container contamination, preservative contamination, laboratory reagent water contamination, or cross-contamination between samples during transport;
- Review of method blank data to determine the presence of any sources of contamination in the analytical process;
- Review the MS data to evaluate the potential for matrix effects and as a measure of analytical accuracy. MS recoveries will be compared against laboratory acceptance criteria to determine if they are within or outside of warning and control limits for percent recoveries;
- Review of matrix spike/matrix spike duplicate (MS/MSD) data to evaluate sample homogeneity and as a measure of analytical precision. MS/MSD data will be compared to laboratory acceptance criteria for the maximum RPD;
- Review of any BS data (if available) as a measure of analytical accuracy. BS recoveries will be compared against laboratory acceptance criteria to determine if they are within or outside of warning and control limits for percent recoveries;
- Review of blank spike and blank spike duplicate (BS/BSD) data (if available) as a measure of analytical precision. BS/BSD data will be compared to laboratory acceptance criteria for the maximum RPD;

- Review of standard reference material (SRM) or LCS data (if available) as a measure of analytical accuracy. SRM and LCS data will be compared to the certified acceptable ranges of analytical values;

- Review of sample and sample duplicate data (if available) as a measure of sample homogeneity and as a measure of analytical precision. Sample and sample duplicate data will be compared against the laboratory acceptance criteria for the maximum RPD;

- Review of surrogate recovery data to access extraction efficiency, effectiveness of sample introduction, and possible loss during cleanup activities. Surrogate recoveries will be compared to laboratory acceptance criteria to determine if they are within or outside of acceptable limits; and

- Review of sample dates, extraction/digestion dates, and analysis dates to determine if maximum holding times were met or exceeded.

11.4 DATA REPORTING

Analytical reports comprise final results (uncorrected for blanks and recoveries unless specified), methods of analysis, levels of reporting, surrogate recovery data, and method blank data. In addition, special analytical problems will be noted in the case narratives. The number of significant figures reported are consistent with the limits of uncertainty inherent in the analytical method. Consequently, most analytical results will be reported to no more than two (2) or three (3) significant figures. Data are normally reported in units commonly used for the analyses performed.

Concentrations in liquids are expressed in terms of weight per unit volume (e.g., milligrams per liter, mg/L). Concentrations in solid or semi-solid matrices are expressed in terms of weight per unit weight of sample (e.g., micrograms per gram, ug/g). Reporting limits take into account all appropriate concentration, dilution, and/or extraction factors, unless otherwise specified by program requirements.

A client report is generated with various steps of approval prior to printing of the final version. If any analytical anomalies were encountered during the analyses, e.g., an out-of-control matrix duplicate, it is documented in a case narrative. The case narrative is prepared by the respective operating unit and submitted to the Data Management Section to insert in the final report.

The final report forms are printed, data packages are organized, a glossary of flags and acronyms is added, and reports are paginated. The Project Manager and/or the Laboratory Manager or designee will review and sign the report prior to delivery.

11.4.1 Reporting Format

The final data reports provided by TBD are standard client reports. These reports will be submitted with the final project report.

The standard client report contains a transmittal letter and the following:

- Case Narrative describing: data qualifiers, sample collection, sample preparation (e.g., extraction or digestion) and analysis dates, and a description of any technical problems encountered with the analysis;
- Sample data summaries to include appropriate QC result summaries; and
- Five-peak library search report for GC/MS volatiles and semi-volatiles.

11.5 LABORATORY TURNAROUND TIME

The turnaround time (TAT) for preliminary raw data for the confirmation samples is estimated at approximately 72 hours. A seven-day TAT will be required for all TCLP analyses and disposal characterization samples.

SECTION 12

PREVENTATIVE MAINTENANCE

12. PREVENTATIVE MAINTENANCE

The ability to generate valid analytical data requires that all analytical instrumentation be properly and regularly maintained. The responsibility of routine care lies with the analysts using the instruments. Guidance on required routine maintenance. as well as troubleshooting information, is provided in the respective instrument manuals and laboratory SOPs. For more extensive preventative maintenance or emergency repair service, the laboratory maintains full service contracts on all major instruments or has accounts established with vendors. The elements of the maintenance program are discussed in the following sections.

12.1 INSTRUMENT MAINTENANCE LOGBOOKS

Each analytical instrument is assigned an instrument maintenance logbook. All maintenance activities are recorded in the maintenance log. The information entered in the maintenance log includes:

- Date of service or maintenance;
- Person performing service or maintenance;
- Type of service performed and reason for service;
- Replacement parts installed (if appropriate);
- Documentation of the re-establishment of working order; and
- Miscellaneous information.

If service is performed by the manufacturer, a copy of the service record (when available) is affixed to the notebook page, or cross-referenced in the notebook to a separate maintenance file. The service record should include sufficient detail to describe the service performed (e.g., not just "service call," but "replaced pump motor gear"). If the service record does not spell out this information, it must be written separately into the maintenance log. There must also be a reference to the file number, notebook page, or appropriate cross reference that substantiates re-establishment of working order.

12.2 INSTRUMENT MAINTENANCE AND REPAIR

Preventative maintenance and repairs that cannot be performed by laboratory staff are contracted to the manufacturer's service section or to an authorized maintenance vendor. Laboratory service agreements provide for preventative maintenance, emergency service, and emergency shipping of spare parts. Annual service of the laboratory balances is an example of contracted preventative maintenance. For emergency response, service contracts on the GC/MS instruments and AA-ICP require rapid response. (Typically, service representatives are on site within 48 hours of a service call.) The service contracts also provide for overnight delivery of critical spare parts in response to a service request.

Examples of maintenance procedures and suggested frequencies for major analytical instrumentation will be submitted at a later date with the laboratory SOPs. Actual procedures may vary significantly for specific instruments, depending on the manufacturer, peripherals, and data system. However, this table provides an indication of the level of detail required for maintenance. The frequency of maintenance suggested assumes daily operation of the instrumentation. Laboratory and instrument specific information is provided in the respective instrument manuals, and in the analytical SOPs.

Each instrument or utensil used in the analysis of asbestos is maintained to prevent cross-contamination of samples or contamination of the laboratory environment. Any surface subject to contamination receives a weekly wet cleaning. The Weston Auburn Laboratory also practices an in-house air monitoring program. This program ensures the detection of any contamination of the laboratory environment through weekly air sampling and subsequent analysis. In the event contamination is detected, the laboratory will investigate, locate the source, and carry out the necessary corrective actions to contain and dispose of the contaminate source.

Asbestos-contaminated waste (tissues, air filtration filters, etc.) is disposed of at a sanitary landfill in accordance with applicable local, state, and federal regulations. A record of disposal is maintained in the laboratory files.

SECTION 13

PERFORMANCE AND SYSTEM AUDITS

13. PERFORMANCE AND SYSTEM AUDITS

Quality assurance audits and surveillances are conducted to assess the performance of laboratory systems in meeting technical, regulatory and client requirements. They provide a means for management to be apprised of, and to respond to, a potential problem before it actually impacts on laboratory operations. They also are a mechanism for ensuring closure of corrective actions resulting from external audits.

Performance audits test the laboratory's ability to assay an unknown sample correctly. They may be single blind or double blind. In a single blind study, the analyst is not provided with the acceptable result for the unknown sample until after the experimental result is reported; however, it is known that the sample is a performance test. In a double blind performance test, the analyst not only has no knowledge of the acceptable result, but the sample is disguised in such a manner as to maintain anonymity as a performance test sample. In some double-blind studies, even laboratory management is unaware that performance test samples are not actual samples.

Systems audits and surveillances are used to evaluate the operational details of the QA program. An audit is a systematic assessment of an area of laboratory operation. It may comprise evaluation of an operational unit, e.g., GC/MS Analysis or Data Reporting; or it may have a more narrow focus, such as an assessment of adherence to chain-of-custody procedures. Audits are conducted by persons other than those who performed or directly supervised the work being inspected. A surveillance consists of inspection or monitoring of a specific targeted area for compliance with requirements, such as an evaluation of a single analytical method to ensure conformance with the written SOPs.

13.1 EXTERNAL AUDITS

Performance audits, as well as on-site systems audits, by non-WESTON personnel and clients are an on-going, continual occurrence. Whether the audit is scheduled or unannounced, full cooperation with the audit team will be provided by the laboratory staff. A full response to any deficiencies cited as a result of a performance audit or on-site visit will be addressed within the schedule determined by the client. The QA Manager is responsible for coordinating all external audits and any resultant corrective actions.

On-site evaluation by agencies, clients, or designated third-party auditors (both government and non-government) are routinely conducted to assure program compliance. These audits are preferentially pre-scheduled with the client to ensure that appropriate personnel are available to answer questions. However, audits may also be unannounced. In either instance, full cooperation with audit team the laboratory staff during the on-site visit will be provided.

Program compliance may be defined as adherence to requirements for a specific certification or licensing program, e.g., state certifications, or adherence to specific project requirements.

Weston's Auburn PLM laboratory assures a high standard of quality through constant participation in the NVLAP Round-Robin accreditation program, in-house, as well as advanced training courses of analysts, seminar participation, and inter-laboratory testing. The training and seminar participation are not necessarily auditing tools, but are reviewed periodically to ensure the analysts are receiving and consequently utilizing the most current and acceptable methods.

Although only one analyst's results per round are reported in the NVLAP accreditation program, each analyst separately participates by analyzing, recording, and reporting test sample results to the Quality Control Contractor (QCC). These results are useful in evaluating the laboratory's performance on an individual analyst basis, because each analyst's results can be compared to the reference asbestos percentages reported by the NVLAP/NIST. Inter-laboratory testing affords the laboratory the opportunity to compare its results and subsequently its procedures with those of another laboratory. In this case, each laboratory reports its results for the same or a duplicate sample.

These auditing practices are designed to monitor the capability and performance of the analysts. It is the responsibility of the QCC to oversee performance testing and the maintenance of the data generated from these audits. The scheduling of such audits is also the responsibility of the QCC. Each analyst's training, qualifications, and test performances are documented in his/her personnel folder.

13.2 PERFORMANCE AUDITS

Internal performance audits conducted at the bench level provide the analyst with a tool to evaluate the acceptability of a specific data set. This is accomplished through analysis of laboratory control samples or spiked blanks of known concentration to the analyst which must meet minimum performance standards. When these QC checks are performed in duplicate, method accuracy and precision information can be generated to demonstrate the proper functioning of the total measurement system.

Single blind performance audits (e.g., Performance Evaluation Studies (PES)) are routinely analyzed at least four times a year: twice as U.S. EPA Water Supply and Water Pollution studies, and twice as New York State Department of Health Potable, Non-Potable, Solid and Hazardous Waste, and Air and Emissions. Additionally, NISOH EL PAT samples are analyzed quarterly. Other water/wastewater PES are received quarterly from confidential clients for full TCL/TAL plus selected wastewater parameters.

As an additional feature of the laboratory's internal QA Program, double blind performance evaluation samples are submitted to the laboratory periodically for analysis. These samples originate both internally and externally, and are scheduled through the laboratory's project management system to ensure anonymity. Over the course of a year, samples are submitted to cover all routinely analyzed methods.

Externally originated double blinds are analyzed quarterly for selected organic and inorganic compounds in either soil or water. Externally originated samples are purchased from a commercial vendor in a constituted form. The laboratory initiates these external double-blind samples using the same procedures utilized for routine clients through a designated project manager, to include, for example, assigning of work order numbers, forward scheduling the analyses, generation of sample container orders so that samples arrive in standard containers, etc.. This system effectively gets samples in the laboratory for unbiased analysis. Any deficiencies noted are investigated by the quality assurance department and a corrective action plan is implemented.

Internally generated samples are handled in the same manner as the externally purchased double blinds, except that they are prepared by the laboratory, unknown to the analysts, using NIST or commercially available reference materials.

13.3 SYSTEMS AUDITS AND SURVEILLANCES

The laboratory QA Manager has overall responsibility for monitoring the internal QA/QC program. The QA Manager has a staff to provide in-house audits and to review analytical data packages.

Internal laboratory systems audits and surveillances will be conducted and documented such that all laboratory sections receive a QA audit at least annually. Unique client audit procedures and data requirements will be complied with as specified contractually. The internal audit consists of a review of laboratory systems, procedures, and documentation. Internal systems audits include specific attention to issues noted in external audits. Any deficiencies and/or deviations are documented and a summary report is prepared.

The following items may be included for focus in routine laboratory audits and surveillances:

- Life of reagents
- Holding times
- Interferences (if any)
- Maintenance logs
- Standards traceability
- Preparation of glassware
- Sample preservation
- Computer spreadsheets
- Calculations
- Standard deliverables
- Lab book documentation
- Safety
- Method reporting limits
- Current operating practice

A system audit report is prepared and distributed to the responsible party, including the appropriate supervisor. A maximum of one calendar month is given to address any recommended corrective actions. The original copy of the completed responses is kept on file in the QA Section. QA also conducts follow-up audits to ensure closure of items noted in the respective original systems audits.

13.4 RAW DATA AUDITS AND SURVEILLANCES

All laboratory notebooks are routinely reviewed by the analyst and a second reviewer to assure correctness of sample and quality control calculations. In addition, all active laboratory data books and QC files are subject to periodic audits/surveillances by QA personnel.

Raw data evaluations will be based on the following completed information, as applicable:

- Parameter and method
- Instrument ID and settings
- Date and full signature of analyst
- Valid standard curve
- Frequency of QC
- QC calculations and recoveries
- Sample calculations
- Neatness and ease of data interpretation

Reviewed data will be documented as "reviewed by" and signed (initials or full signature) and dated by the reviewer.

SECTION 14

QC REPORTS TO MANAGEMENT

14. QC REPORTS TO MANAGEMENT

Quality assurance reports communicate quality status and needs to upper management. By providing summaries of quality data and analysis of relevant situations, these reports provide management a feedback loop to monitor the effectiveness of laboratory improvement activities. Quality assurance reports distinguish between major and minor issues, while minimizing false alarms. The reports emphasize objective quality measurements, but when subjective elements are reviewed, these are reported without blame.

For day-to-day problems, a Control Standard Summary report is used. These forms are typically used for process related circumstances requiring immediate attention. Distribution of these corrective action documents includes the appropriate Project Manager and/or Section Manager that must acknowledge and approve the corrective actions in order to remedy project related out-of-control situations.

At Ecology and Environment Inc., regular and periodic quality reports are prepared with each project deliverable. These reports are less uniform by nature, and therefore result in more subjective measurements. In a cumulative sense, where applicable, these reports comprise or address the following issues:

- Identifies the "vital few" quality problems to help focus resources where they will be most beneficial;
- Reports on the status of quality improvement initiatives; results achieved; work in progress; next steps and by whom; action needed by upper management; and lessons learned;
- Summarizes audit or assessment findings and observations, whether intra-section, Division or of subcontractors and suppliers;
- Discusses major quality developments occurring in the environmental industry, government agencies, clients, competitors or other macro-environmental forces;
- Proposes initiatives for upper-management consideration.

APPENDIX A

LABORATORY CERTIFICATION

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
HTRW CENTER OF EXPERTISE
12565 WEST CENTER ROAD
OMAHA, NEBRASKA 68144-3869

REPLY TO
ATTENTION OF:

January 29, 1999

Hazardous, Toxic and Radioactive Waste
Center of Expertise

Ecology and Environment, Inc. Analytical Services Center
4493 Walden Avenue
Lancaster, NY 14086

Gentlemen:

This letter supercedes a previous letter from this office dated October 19, 1998 that inadvertently omitted the following Parameter: Cyanide in Solids.

This correspondence addresses the ongoing validation status of your laboratory by the U.S. Army Corps of Engineers (USACE) Hazardous, Toxic and Radioactive Waste Center of Expertise (HTRW CX) for HTRW analysis.

Your laboratory is now validated for the parameters listed below:

METHOD	PARAMETERS	MATRIX(2)
300 series	Anions(4)	Water(3)
8021B	BTEX	Water(3)
8021B	BTEX	Solids
8270C	Semivolatile Organics	Water(3)
8270C	Semivolatile Organics	Solids(3)
9010B/9012B	Cyanide	Water(3)
9013B/9012B	Cyanide	Solids
8330	Explosives	Water(3)
8330	Explosives	Solids(3)
8151A	Chlorinated Herbicides	Water(3)
8151A	Chlorinated Herbicides	Solids
8021	Halogenated Volatile Organics	Water(3)
8021	Halogenated Volatile Organics	Solids
SW-846	TAL Metals(1)	Water(3)
SW-846	TAL Metals(1)	Solids(3)
413.1	Oil & Grease	Water(3)
8081A	Pesticides	Water(3)
8081A	Pesticides	Solids
8082	Polychlorinated Biphenyls	Water(3)
8082	Polychlorinated Biphenyls	Solids(3)
8310	Polynuclear Aromatic Hydrocarbons	Water(3)
8310	Polynuclear Aromatic Hydrocarbons	Solids
9060	Total Organic Carbon	Water(3)
9060	Total Organic Carbon	Solids(3)
Mod 8015	TPH - DRO/GRO	Water(5)
Mod 8015	TPH - DRO/GRO	Solids(5)

418.1	TRPH	Water(5)
418.1/9071	TRPH	Solids(5)
8260A	Volatile Organics	Water(3)
8260A	Volatile Organics	Solids

Remarks: 1) TAL Metals: Aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

2) 'Solids' includes soils, sediments, and solid waste.

3) The laboratory has successfully analyzed a performance evaluation sample for this method/matrix.

4) Anions: Chloride, fluoride, sulfate, nitrate, nitrite, orthophosphate.

5) Approval for this parameter is based on review of SOPs.

Your laboratory will continue to be validated for sample analysis by the methods listed above. The period of validation for all parameters has been previously established and expires on January 30, 2000.

USACE reserves the right to conduct additional laboratory inspections or to suspend validation status for any or all of the listed parameters if deemed necessary. It should be noted that your laboratory may not subcontract USACE analytical work to any other laboratory location without the approval of this office. This laboratory validation does not guarantee the delivery of any analytical samples from a USACE Contracting Officer Representative.

Any questions or comments can be directed to Richard Kissinger at (402) 697-2569. General questions regarding laboratory validation may be directed to the Laboratory Validation Coordinator at (402) 697-2574.

Sincerely,

for Marcia C. Davies, Ph.D.
Director, USACE Hazardous,
Toxic and Radioactive Waste
Center of Expertise