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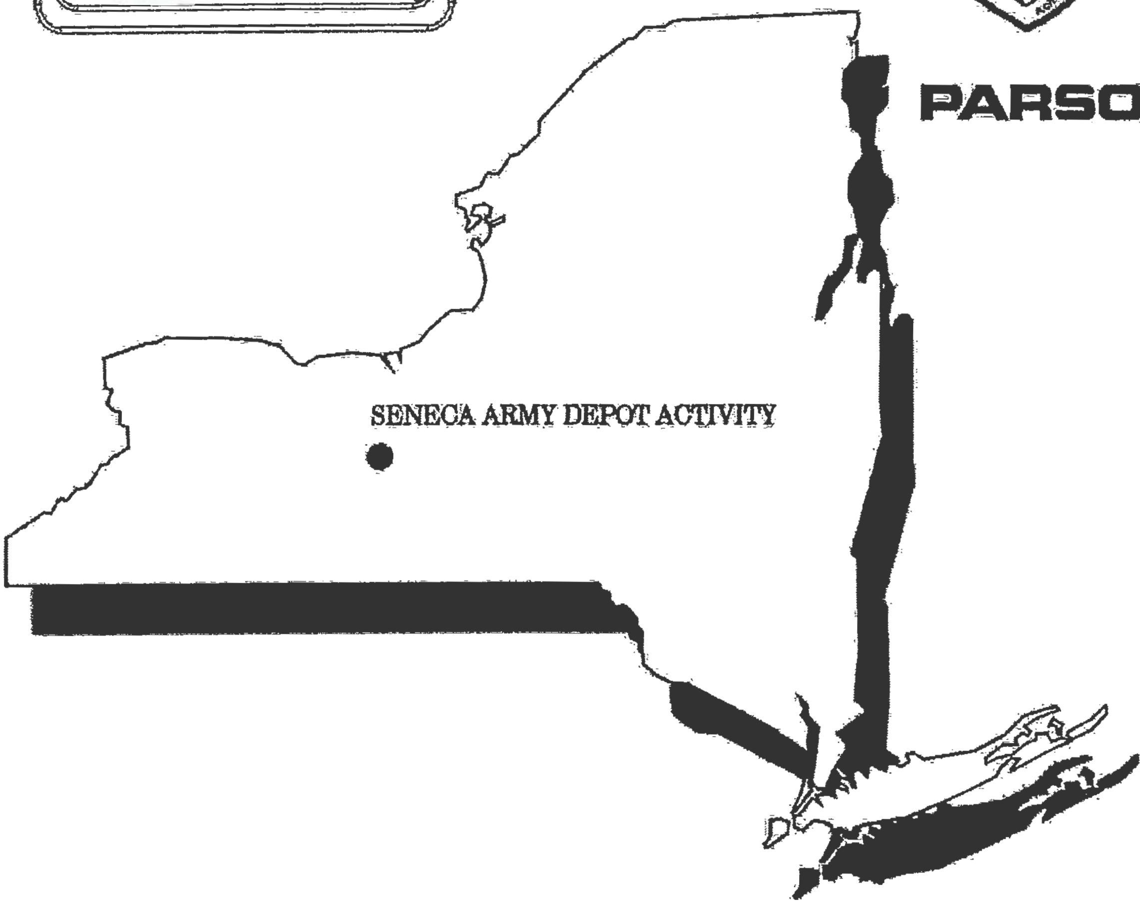
U.S. ARMY ENGINEER DIVISION
HUNTSVILLE, ALABAMA

PARSONS



FINAL
TREATABILITY STUDY WORK PLAN
FOR THE AIRFIELD SMALL ARMS RANGE (SEAD-122B)

Prepared by **PARSONS**
NOVEMBER 2003

CONTRACT NO. DACA87-95-D-0031
DELIVERY ORDER NO.32

FINAL

TREATABILITY STUDY WORK PLAN
(SOIL SCREENING TESTING)
AIRFIELD SMALL ARMS RANGE (SEAD-122B)

Prepared For:

Seneca Army Depot Activity
Route 96
Romulus, NY

U.S. Army Corps of Engineers
Huntsville Engineering and Support Center

and

U.S. Army Corps of Engineers
New York District

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Date

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Date

NOVEMBER 2003

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LIST OF ACRONYMS

ELECB	U.S. Army Corps of Engineers Environmental Laboratory, Environmental Chemistry Branch
HASP	Health and Safety Plan
LIMS	Laboratory Information Management Systems
MRD	Missouri River Division
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PPE	Personal Protection Equipment
ppm	Parts Per Million
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SAR	Small Arms Range
SOP	Standard Operating Procedure
TCLP	Toxicity Characteristic Leaching Procedure
TWA	Time-Weighted Average
US	United States
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WP	Work Plan

SECTION 1

INTRODUCTION

1.1 PURPOSE AND OBJECTIVES

This Work Plan (WP) details the scope of work, as contemplated in the *Characterization Report and Treatability Work Scope For The Airfield Parcel (SEAD-122B) Small Arms Range* (SAR) (Parsons, October 2002) at the Seneca Army Depot in Romulus, New York.

1.1.1 Purpose

The treatability work (excavation, screening, and confirmation sampling) will be done to explore the effectiveness of "dry screening", which is a method of treating soils in SAR's by reducing the total lead content. The soil will be chosen from isolated areas where concentrations of lead found during the investigation were greater than 400 parts per million (ppm). This WP outlines the work activities for completing a treatabilty study of the impacted soils.

1.1.2 Objectives

This treatability study will assess the effectiveness of mechanical removal (i.e. dry screening) of bullets from range soils to reduce lead concentrations in the soil. The effectiveness of this treatment will be assessed by:

- Comparing the total lead concentration of treated soils (post-screening) with untreated soils (pre-screening);
- Determining the weight of recovered bullets and bullet fragments in pounds and;
- Assessment of the costs of operations.

Sampling objectives include analysis for total lead concentration as follows:

- Prior to dry screening, sampling will be conducted to assess the condition (soil quality) of the pre-treated soils.
- Following the dry screening, sampling will be conducted to assess the condition (soil quality) of the treated soils.

Following the excavation, confirmation sampling will be conducted to assess the soil quality in excavated areas prior to backfilling. The confirmation samples will be analyzed for total lead concentrations.

The guidance value of 400 ppm, total lead, will be used to assess soil quality. Less than 400 ppm shall be considered reusable for backfill; greater than 400 ppm shall be considered non-reusable.

Following completion of this treatability study, the Army will prepare a report of the treatability study results. At that time, the Army expects to be well positioned to assess the further course of the RI/FS at this site and to recommend separately, with sufficient specificity, the balance of response activity appropriate for this site. As part of this document, the Army will propose, consistent with the proposed use of the site, whether and, if so, what kind of remedial or removal action should be performed at the site.

1.2 SCOPE

The anticipated scope of work does not include any experimental designs or procedures. The treatability study will utilize standard construction techniques, standard constuction equipment and will include the following tasks:

Mobilization/Site Preparation
Excavation – Approximately 750 cubic yards.
Lead/Bullet Particle Separation/Screening – Approximately 500 cubic yards.
Disposal – Dispose of soil with lead concentrations exceeding 400 ppm.
Site Restoration – Backfill and erosion control.

These tasks are fully described in Section 2. Sampling and analytical tasks are described in Section 3.

1.3 GENERAL SITE DESCRIPTION

The Seneca Airfield SAR consists of two bermed small arms ranges, one used for small arms and the second for machine gun targeting (Figure 1). The small arms range and machine gun firing range berms are comprised of approximately 28 feet of brown to dark brown to gray, silt with clay with interbedded shale, and traces of fine sand and fine to medium gravel. The soil description is based on the drilling of seven soil borings from the top of the berms in June 2002 (Parsons, October 2002).

There have been modifications to the size and shape of the firing lanes and berms since initial construction by the Army in the 1940's. The current configuration consists of a 20-lane small arms range with protective wooden baffles, and a two-lane machine gun range. The berms form a horseshoe-shaped protective barrier around each range to trap stray rounds and to protect the bunker and airfield areas behind the range. The west-trending topographic gradient is relatively flat. The Airfield SAR has a network of footer drains along each baffle/target line. These drains collect runoff from the berms (maximum height 28 feet) to grassed expanses that convey surface water to the open area located west of the range. No obvious depressions where surface water could collect are apparent at this site.

1.4 HISTORIC OVERVIEW OF OPERATIONS

The Airfield SAR is located within the Seneca Army Depot, a 10,587 acre facility in Seneca County, Romulus, New York (Figure 2). The facility has been owned by the United States Government and operated by the Department of the Army since 1941. Since its inception in 1941, SEDA's primary mission was the receipt, storage, maintenance and supply of military items.

The Airfield SAR was operated by the Army, Navy and Air Force since the 1950's for small arms range qualification of base and security personnel.

1.5 PERFORMANCE STANDARDS AND REGULATIONS

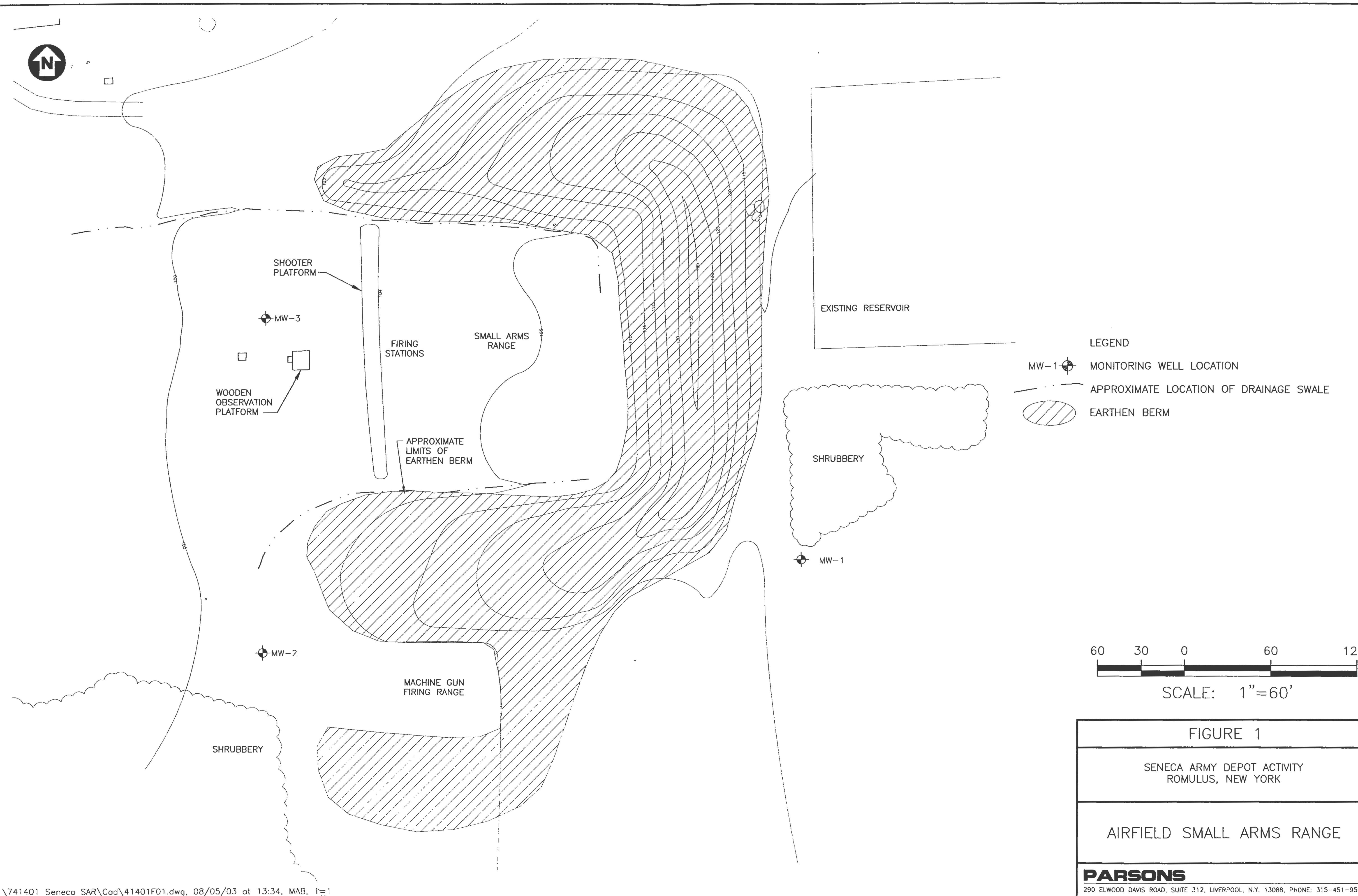
The following have been identified as appropriate and relevant standards for this work:

- Soil – Criteria in accordance with the United States (US) Environmental Protection Agency (EPA) residential guideline for lead in soil.
- Solid Waste – Criteria in accordance with USEPA SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA, 1996).

1.6 SUMMARY OF PREVIOUS INVESTIGATION

The Army performed a characterization study at the site in June-July 2002, similar to a Phase I Remedial Investigation. This study demonstrated no impacted groundwater at or adjacent to the site, but some elevated lead concentrations, in soil, were detected along portions of the berm perimeter and isolated areas on the range floor and drainage swale (Figure 3).

Lead was identified as the major constituent of concern. A soil treatability study was proposed. This work plan is based on the proposed treatability study work scope presented in the characterization report (Parsons, October 2002).


SHOOTER PLATFORM
FIRING STATIONS
SMALL ARMS RANGE
MW-3
WOODEN OBSERVATION PLATFORM
APPROXIMATE LIMITS OF EARTHEN BERM
EXISTING RESERVOIR
SHRUBBERY
MW-1
MW-2
MACHINE GUN FIRING RANGE
SHRUBBERY
LEGEND
MW-1 MONITORING WELL LOCATION
APPROXIMATE LOCATION OF DRAINAGE SWALE
EARTHEN BERM
60 30 0 60 120
SCALE: 1"=60'
FIGURE 1
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK
AIRFIELD SMALL ARMS RANGE
PARSONS
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560
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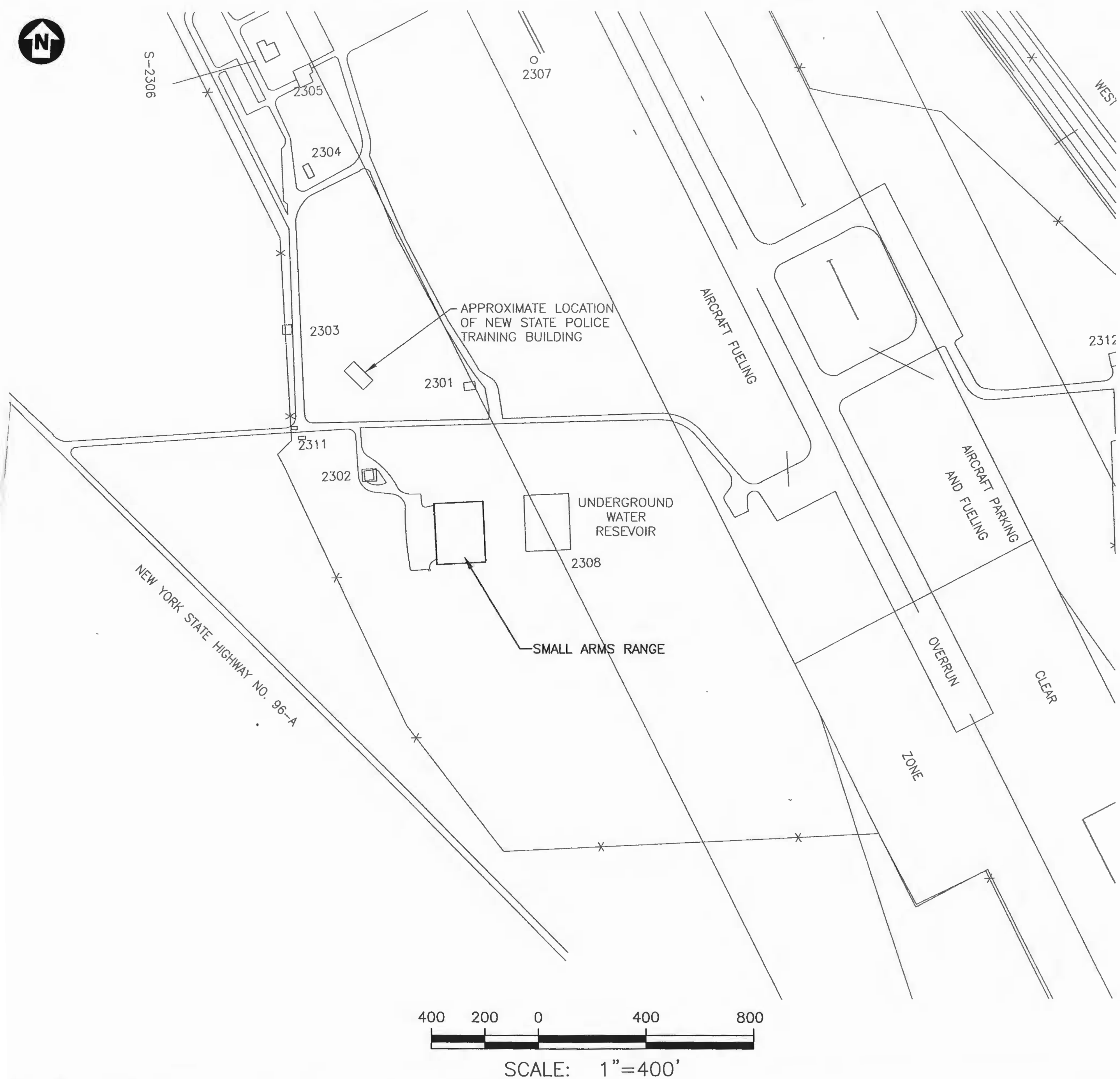
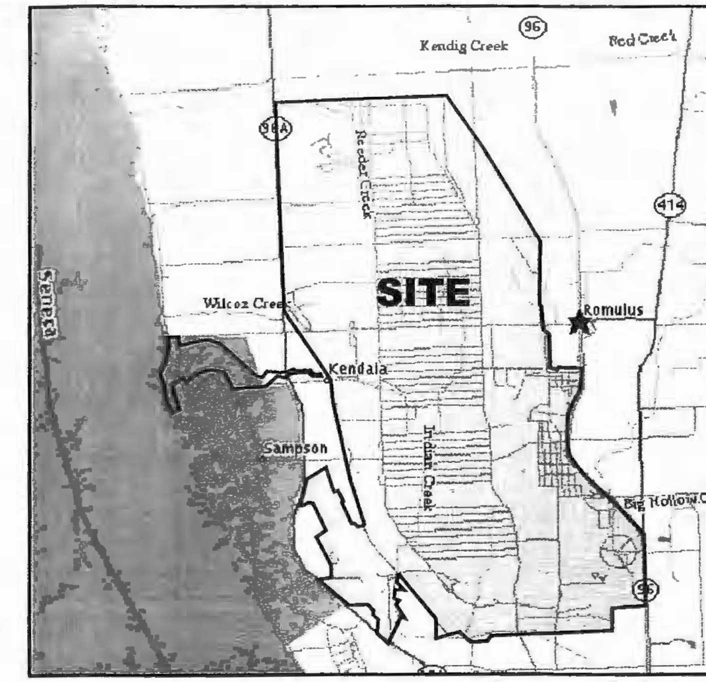
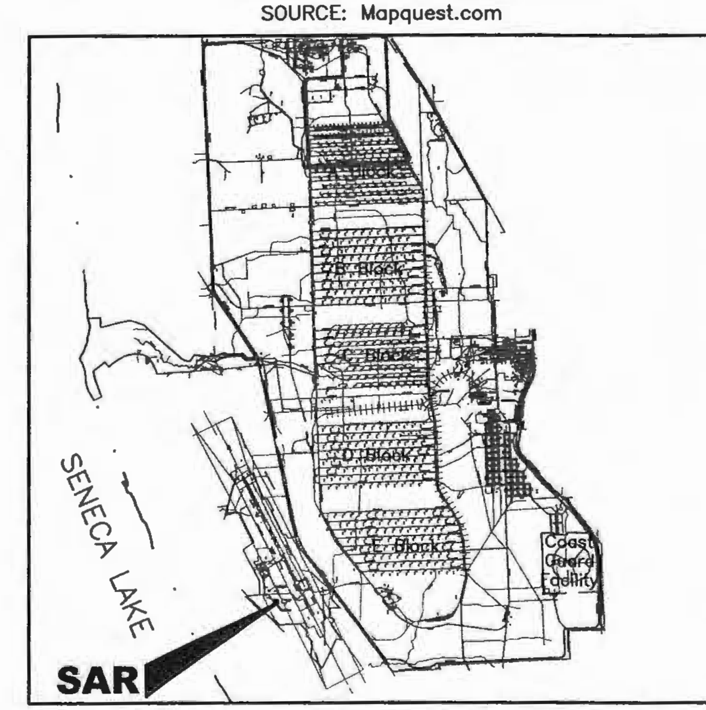




REGIONAL MAP
SCALE: 1 INCH=2.5 MILES
SOURCE: Mapquest.com



SITE MAP
SCALE: 1 INCH=10,000 FEET

FIGURE 2

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

SMALL ARMS RANGE
SITE LOCATION PLAN

PARSONS
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560

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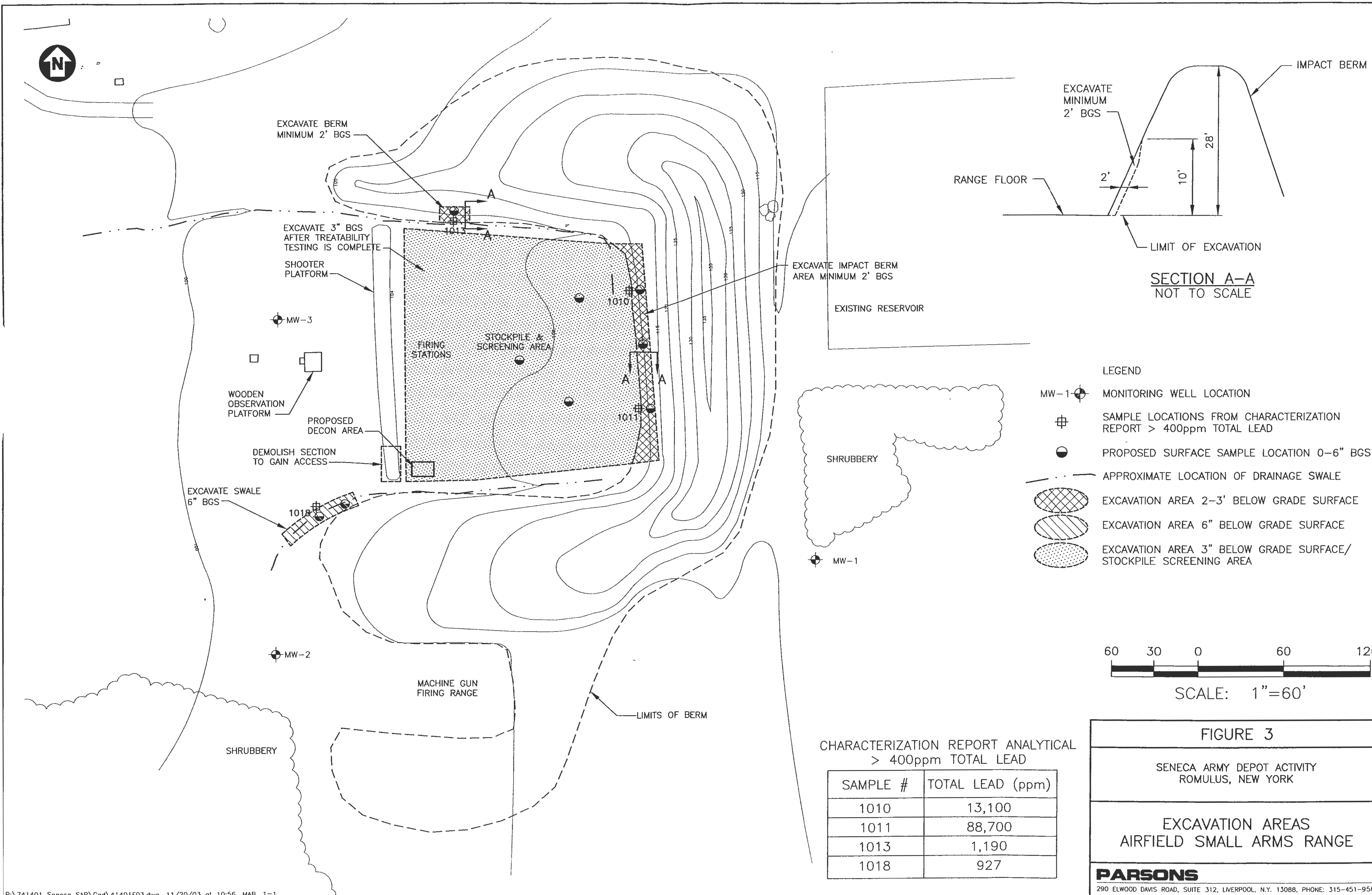

CHARACTERIZATION REPORT ANALYTICAL
> 400ppm TOTAL LEAD

SAMPLE #	TOTAL LEAD (ppm)
1010	13,100
1011	88,700
1013	1,190
1018	927

FIGURE 3

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

EXCAVATION AREAS
AIRFIELD SMALL ARMS RANGE

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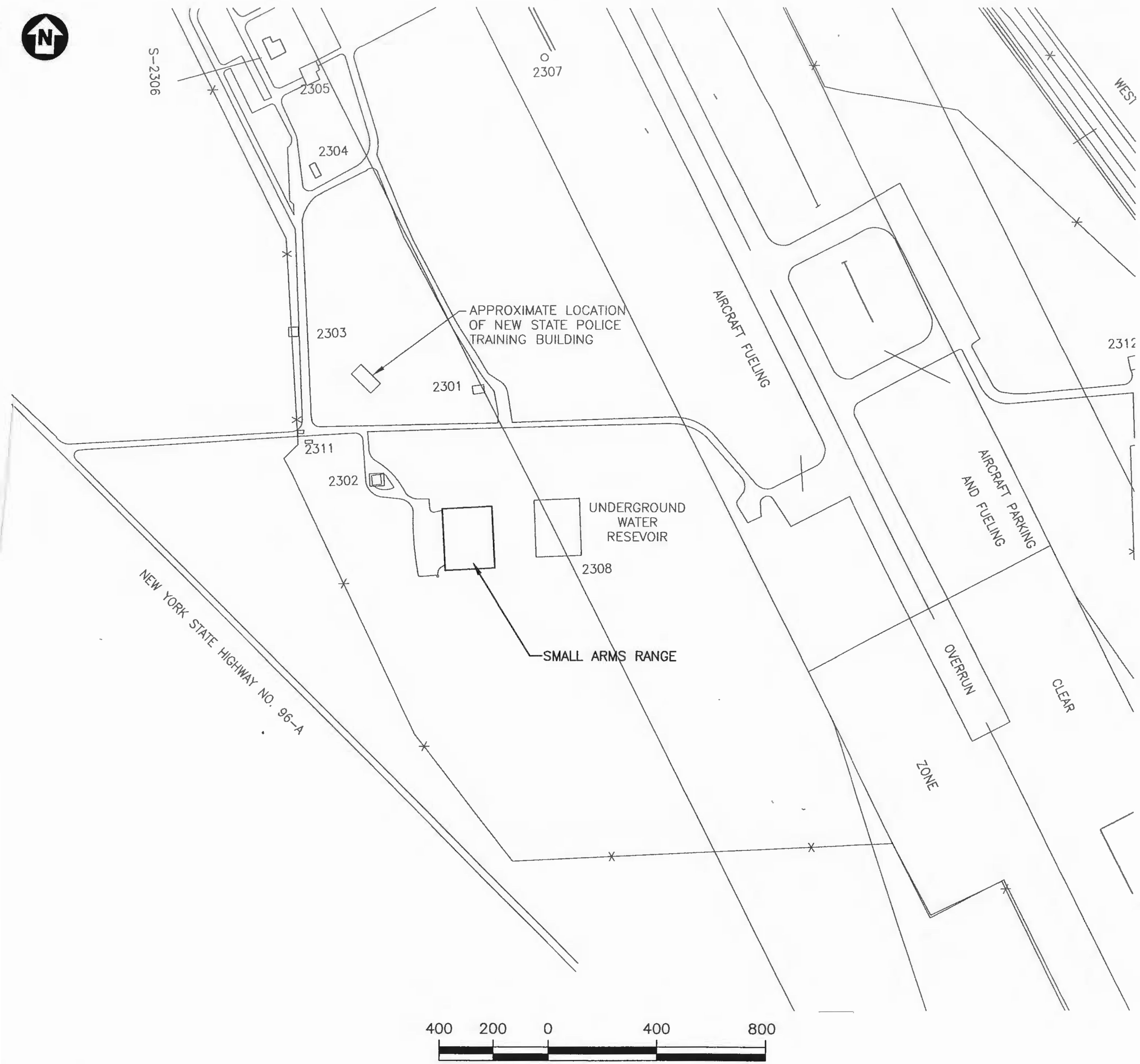
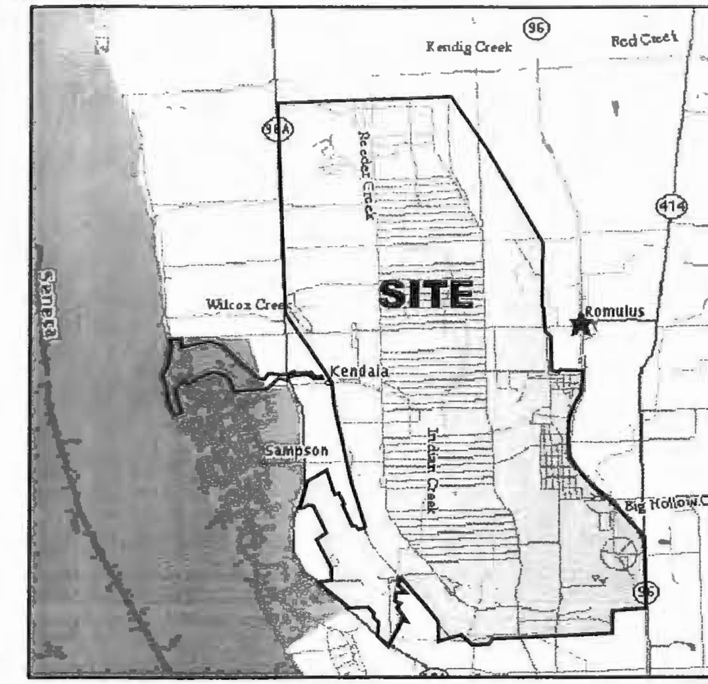
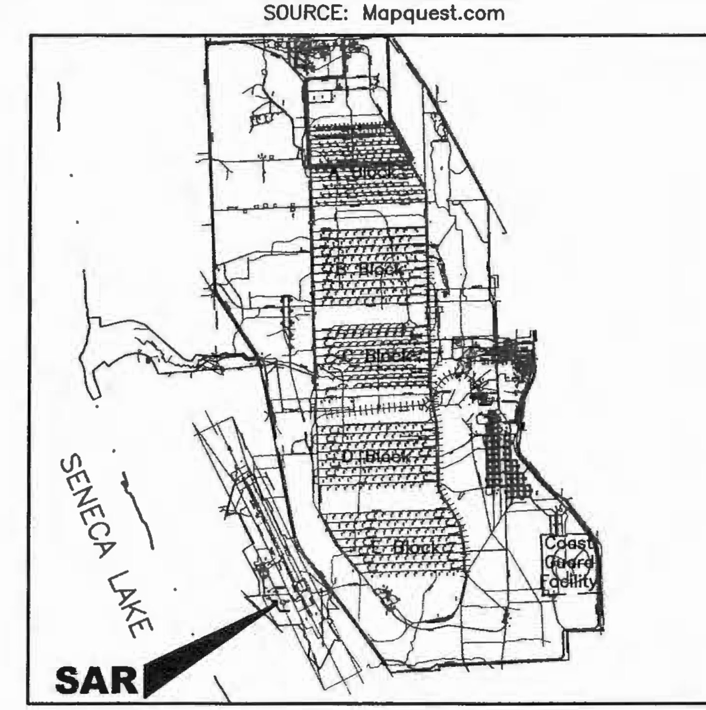


SCALE: 1"=400'



REGIONAL MAP
SCALE: 1 INCH=2.5 MILES
SOURCE: Mapquest.com



SITE MAP
SCALE: 1 INCH=10,000 FEET

FIGURE 2

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

SMALL ARMS RANGE
SITE LOCATION PLAN

PARSONS
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560

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SECTION 2

WORK SCOPE

2.1 SOIL EXCAVATION

2.1.1 Mobilization/Site Preparation

Mobilization and site preparation will include the following tasks

- Demolition and off-site disposal of the existing range baffles and targets.
- Off-site disposal of the pea gravel and miscellaneous demolition debris.
- Clearing and grubbing, as necessary, the area between the shooter platform and the berm/backstop.
- Construction of a bermed and lined (10-mil poly) decontamination area.
- Conducting physical property and sieve analysis of the soils at an off-site laboratory.

2.1.2 Excavation Areas

Approximately two to three feet of soil (approximately 500 cubic yards) will be excavated from the impact berm areas. Approximately six inches of soil (approximately 100 cubic yards) will be excavated from the bottom of the drainage swale. Following the treatability study work, approximately three inches of soil (approximately 150 cubic yards) will be excavated from areas affected by the screening operations. See Figure 3 for proposed excavation areas. A hydraulic excavator will be used to mechanically excavate the soils.

2.1.3 Erosion Control

Temporary erosion control measures such as hay bales and silt fence may be used for erosion control. Water run-on and run-off is not expected to be a problem due to the short duration of the project and the flatness of topography. Erosion control measures shall be established during the excavation on an as-needed basis.

Silt fencing and/or hay bales will be placed around the perimeter of all temporary stockpiles. The stockpiles will be covered with 6-mil poly when not being actively worked on.

2.1.4 Dust Control

Water obtained from an on-site source (hydrant water) will be used, as necessary, to reduce dust emissions. Water will be applied to control fugitive emissions, but not cause excessive runoff. Generally, if dust levels are visible, dust suppression methods will be employed.

2.2 STOCKPILE AND SCREENING AREAS

Stockpile and screening areas will be set up within the confines of the SAR as shown on Figure 3. Soil berms will be constructed around the stockpile/screening area. Excavated soils will be stockpiled into three (3) equally sized piles within the confines of this temporary work area.

2.3 SCREENING OPERATIONS

A commercially available power screen, such as a Nordberg SW348 or equivalent, will be used to screen the excavated soils (approximately 500 cubic yards). Three separate screen sizes will be tested to assess the effectiveness of each individual screen size. Soil will be placed onto the screen and shaken. The amount of soil that passes and does not pass each screen size will be recorded.

Oversize inert materials, (such as rocks, concrete, bricks, wood, debris, etc.) that do not pass the screens will be inspected for bullets. If there are no bullets, the rocks, concrete and bricks will be considered clean and re-usable as backfill. Wood and general debris will be disposed of off-site as non-hazardous debris.

Soil that does pass the screens will be stockpiled, separately from the oversize material, and inspected for bullets, bullet fragments and any evidence of contamination. Results of the inspection will be recorded. Whether bullets are observed or not, samples will be collected for analysis of total lead concentration.

Bullets that get screened out of the soil will be segregated and recycled and/or disposed of off-site, as appropriate.

2.4 DISPOSAL REQUIREMENTS

2.4.1 Soil and Miscellaneous Debris

Soil that contains 400 ppm or less of total lead will be used as site backfill. Soil containing greater than 400 ppm total lead will be properly characterized and disposed of off-site.

If the soil contains greater than 400 ppm total lead and during disposal characterization is found to contain leachable lead less than 5 mg/L, by TCLP test methods, the soil will be disposed of off-site as a non-hazardous waste.

If the soil contains greater than 400 ppm total lead and during disposal characterization is found to contain leachable lead greater than 5 mg/L, by TCLP test methods, the soil will be disposed of off-site as a hazardous waste.

Load, transport and dispose of lead contaminated soils excavated from the swale (100 cubic yards) and the floor of the range (150 cubic yards) at an off-site landfill.

Miscellaneous debris, such as wood and poly sheeting, will be disposed of off-site as a non-hazardous material.

Personal Protective Equipment (PPE) will be collected and disposed of off-site along with any contaminated soil.

2.4.2 Decontamination Water

Water generated during this project will be disposed of by sprinkling onto the soils that will be disposed off-site and/or drumming the water and transporting to a permitted off-site disposal facility.

2.5 DECONTAMINATION

A temporary decontamination area will be used for decontaminating equipment prior to demobilization. Equipment that has been contaminated by the operations, (i.e. heavy equipment, hand tools, etc.) will be washed with water in this area to remove accumulated debris. Wash waters will be collected and properly disposed of off-site. Debris removed while cleaning will be shipped off-site along with the contaminated soil. Contaminated consumable materials, such as PPE and other consumables will be disposed of off-site along with the contaminated soil.

2.6 SITE RESTORATION

Excavated areas will be backfilled with screened soils that contain total lead in concentrations less than 400 ppm.

An erosion control blanket will be placed over the berm/backstop and anchored into place to provide temporary erosion control until the site is transferred. Cover soil and seeding will not be required at this time.

2.7 HEALTH AND SAFETY

2.7.1 Dust Monitoring

Dust monitoring will be conducted with real-time aerosol monitors during field activities. The action level for total dust in air is 5 mg/m3. Dust will be periodically monitored, downwind of the work area at temporary particulate monitoring locations.

2.7.2 Lead Monitoring

In compliance with the Occupational Safety and Health Administration (OSHA) Lead in Construction Standard (29 CFR 1926.62), a written Lead Compliance Program (Appendix C) will be followed. During initial intrusive activities air samples will be collected daily, in the breathing zone, using an air sampling pump and filter cassette. Samples will be sent to Galson Laboratories in East Syracuse, NY for analysis. Samples will be compared to the action level (30 micrograms per cubic meter of air calculated as an 8-hour time-weighted average) for lead.

2.7.3 Community Air Monitoring Plan

Because the site is secluded and away from any community contact, a community air monitoring plan is not required. However, real-time air monitoring, for particulate levels will be done as described in 2.7.1.

2.8 SCHEDULE

Tasks 1-8 (field work) will be accomplished over a three month time frame as follows:

Task 1: Project notification requirement (30 days prior to start of excavation) – This WP shall be considered official notification of the start of the project.

Task 2: Mobilization/Site Preparation – 2 weeks for mobilization and 2 weeks for site preparation, anticipated start Mid October 2003;

Task 3: Excavation – 1 week following completion of Task 2;

Task 4: Lead/Bullet Screening – 1 week following completion of Task 3;

Task 5: Sampling – immediately following completion of Task 3 and Task 4;

Task 6: Analytical – 3 weeks following completion fo Task 5;

Task 7: Disposal – 2 weeks following completion of Task 6;

Task 8: Site Restoration –1 week following completion of Task 7.

Task 9: Treatability Study Report – 90 days after completion of Task 8.

2.9 COST

The estimated cost for performing this treatability work scope is $250,000. This cost is based on sound and reasonable engineering construction estimates for the various defined tasks.

2.10 PERSONNEL AND EQUIPMENT REQUIREMENTS

The following represents the major labor and equipment requirements for this treatability study.

2.10.1 Personnel

One Site Superintendent/Site Safety Officer, two to three heavy equipment operators and two to three laborers. In addition, there will be a field engineer assigned to take samples and ensure quality control.

2.10.2 Equipment

Standard construction equipment will include a track excavator, loader and power screen.

2.10.3 Temporary Facilities

Parsons maintains a project office at the site. The project office includes telephone, fax, project files, the Final Work Plan, and HASP. A field trailer and a hand and eye wash station will be temporarily stationed at the worksite. Small tools, PPE and other required materials will be kept in the field trailer.

SECTION 3

FIELD SAMPLING PLAN

This Field Sampling Plan describes the guidelines for screened soil stockpile sampling, confirmation sampling and waste characterization sampling. Specific field procedures are described in the Sampling and Analysis Plan (SAP) located in Appendix A of the *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY* (Parsons, June 1995 & Amendments in Appendix B).

Samples to be analyzed for chemical properties will be sent to General Engineering Laboratories, LLC. Samples to be analyzed for physical properties will be sent to PW Laboratories, Inc. Air samples will be sent to Galson Laboratories.

3.1 SAMPLING OBJECTIVES

The sampling objectives for the project are as follows:

- Obtain physical properties for site soils;
- Obtain total lead concentrations of remaining soils in excavated areas (confirmation sampling);
- Obtain total lead concentrations of excavated, but not yet screened soils (pre-treatment sampling);
- Obtain lead concentrations of screened soils (post-treatment sampling);
- Characterize the soils, if any, exceeding 400 ppm total lead for off-site disposal;
- Obtain dust levels at the work site perimeter and;
- Provide employee exposure monitoring for lead.

3.2 CONFIRMATION SAMPLING

After the proposed excavated soils are removed including soil excavated from the drainage swale and soils from the range floor under the temporary screening area, soil samples will be collected from the bottom of the excavated areas. Discrete soil samples will be collected as shown on Figure 3. Confirmation sample locations will be taken in areas that had lead greater than 400 ppm prior to excavation and in areas affected by the treatabilty testing.

Manual sampling methods will be employed to collect samples. A stainless steel scoop will be used to collect individual aliquots.

Laboratory turn-around-time will be field determined on an as-needed basis. The field supervisor will determine how critical is the time needed for results based on current and planned field operations. In general, three week turn-around-time is expected, but this can be expedited as necessary.

Nine (9) discrete confirmation samples will be collected within the surface to 6-inch depth interval from the excavation areas (Figure 3).

Confirmation samples will be analyzed for total lead by EPA Method 6010B (Table 1).

3.3 SOIL SAMPLING

Manual sampling methods will be employed to collect samples. A stainless steel scoop will be used to collect individual aliquots. These aliquots will be placed into a stainless steel bowl for homogenizing by manual mixing. Representative samples will be taken from the mixture and placed into an appropriate container.

3.3.1 Physical Properties

Prior to the start of the excavations, soil from the proposed excavation areas will be collected and sent to an off-site laboratory for testing of physical properties.

One (1) discrete sample will be collected within the surface to 2-foot depth interval from one of the proposed excavation areas (Figure 3).

Physical property testing will include a sieve analysis, hydrometer analysis, Atterberg limits, natural moisture content, bulk soil density, specific gravity and separation and weighing of extraneous materials (Table 1).

3.3.2 Pre-Screened Soils

Excavated soils (pre-treatment) will be stockpiled into three separate piles prior to screening. At approximately 30-35 cubic yard intervals during excavation and stockpiling, a grab sample will be collected from the stockpile as the stockpile is being generated.

Five (5) grabs will be composited into one (1) sample for analysis of total lead concentration.

Soil samples collected prior to screening will be analyzed for total lead by EPA Method 6010B (Table 1).

3.3.3 Post-Screened Soils

Screened soils (post-treatment) will be stockpiled into three separate piles based on the screen size used. At approximately 30-35 cubic yard intervals during excavation and stockpiling, a grab sample will be collected from the stockpile as the stockpile is being generated.

Five (5) grabs will be composited into one (1) sample for analysis of total lead concentration.

Soil samples collected following the screening will be analyzed for total lead by EPA Method 6010B (Table 1).

If the results for total lead, following screening, are less than 400 ppm, the soil will be visually inspected for contamination. If there is no evidence of contamination, the soil will be reused on-site for backfill. If there is evidence of contamination, the material will be considered a waste and disposed of off-site.

If the results for total lead are greater than 400 ppm, the composite sample will be analyzed off-site disposal parameters (Section 3.4).

3.3.4 Oversize (>2-inch) Debris

Debris (i.e., material over two inches) is not contaminated. Therefore, material greater than two inches will be mechanically and/or manually separated. These materials will be inspected for loose soils and brushed, if necessary. No samples will be taken from the greater than 2-inch debris material.

3.4 WASTE CHARACTERIZATION

If the screened soils exhibit total lead concentrations greater than 400 ppm, the soil will be disposed of off-site. Prior to off-site disposal, the soil will be sampled and analyzed for hazardous waste characteristics and other disposal parameters, as required by the selected disposal facility.

No new samples will be collected. The samples will already be at the laboratory. Following lead concentration testing of the soil stockpiles (Section 3.3.2), samples with total lead greater than 400 ppm will be further analyzed for hazardous waste disposal characteristics.

Waste characterization samples will be analyzed for flammability, toxicity, reactivity and corrosivity. The proposed parameters and methods are listed on Table 1.

3.5 AIR SAMPLING

3.5.1 Perimeter Air Monitoring

Air sampling will be conducted during the start of any new construction activities and periodically at a downwind location, at the Exclusion Zone perimeter. Dust monitoring will be conducted with real-time aerosol monitors during field activities. The action level for total dust in air is 5 mg/m3.

3.5.2 Personal Air Monitoring

Personal air monitoring to assess employee exposure will be performed using personal sampling pumps placed on job personnel simulating the greatest risk exposures. One sample per day will be collected. The sample will be analyzed for total lead. An exposure assessment will be conducted. PPE levels will be based on this exposure assessment. Analytical results will be assessed and monitoring will continue or be discontinued following review of the results by Parsons Health and Safety Officer.

If a negative exposure assessment is obtained, personal monitoring will be stopped. See Appendix C for the Lead Compliance Program.

3.6 DATA ANALYSIS AND INTERPRETATION

3.6.1 Lead Standard

Screened soil will be analyzed for total lead concentration following each size screening. Total lead concentrations will be compared to the standard of 400 ppm. This is the EPA residential action level that is protective of human health.

Confirmation samples collected in the excavated areas will be analyzed for total lead concentration. Total lead concentrations will be compared to the standard of 400 ppm.

Soils that do not exceed 400 ppm total lead concentration will be considered reusable for on-site backfill.

Soils that exceed 400 ppm total lead concentration will be considered unusable for backfill. This soil will be considered contaminated, characterized for waste disposal parameters, and disposed of off-site.

3.6.2 Data Management

Data will be collected and analysed, as per the methods specified herein. Chain of custody documentation shall accompany all sample shipments. Data will be reviewed by the Project Manager for accuracy and completeness.

A complete analytical package, as defined by the CLP, will be delivered by the laboratory for every field sample and field QC sample. The deliverable package from the laboratory will contain theappropriate forms for each SW846 method performed, as specified in the CLP. For metal analysis, forms will be completed that include information on analytical results, initial and continuing calibration verification, blanks, ICP interference check, spike sample results, laboratory duplicate sample results, laboratory control sample results, ICP serial dilution results, detection limits, ICP linear range, and raw data.

3.7 QUALITY CONTROL

The data validation will be conducted for all the lead results of both the confirmation samples and the screened soil samples that will be reused as backfill. Data validation will be performed in accordance with the USEPA Region II SOP HW-2 "Evaluation of Metals Data for the CLP Program" (USEPA Region II, 1992). All confirmation samples and screened soil samples used for backfill will be validated.

Quality control procedures are described in Appendix C of the *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY* (Parsons, June 1995 & Amendments in Appendix A).

TABLE 1
SUMMARY OF SAMPLES AND ANALYTICAL REQUIREMENTS

POST-EXCAVATION CONFIRMATION SAMPLES

MEDIUM	TYPE	PARAMETER	ANALYTICAL METHODS
Soil	Discrete	Lead	SW846 6010B

PRE-SCREENED SOILS SAMPLES

MEDIUM	TYPE	PARAMETER	ANALYTICAL METHODS
Soil	Composite	Lead	SW846 6010B

SCREENED SOILS SAMPLES

MEDIUM	TYPE	PARAMETER	ANALYTICAL METHODS
Soil	Composite	Lead	SW846 6010B

WASTE CHARACTERIZATION SAMPLES (SOILS WITH LEAD >400 PPM)

MEDIUM	TYPE	PARAMETER	ANALYTICAL METHODS
Soil	Composite	TAL Metals	SW846 6010B
Soil	Composite	Mercury	SW846 7470A
Soil	Composite	TCL SVOC	SW846 8270C
Soil	Composite	TCL VOC	SW846 8260B
Soil	Composite	TCL PCB	SW846 8082
Soil	Composite	TCL Pesticides	SW846 8081A
Soil	Composite	TCLP Extraction	SW846 1311
Soil	Composite	Corrosivity (pH)	EPA 150.1 or SW846 9045C
Soil	Composite	Ignitability (Flashpoint)	SW846 1010 or 1020A
Soil	Composite	H2S Reactivity	SW846 9012A
Soil	Composite	HCN Reactivity	SW846 9034

PERSONAL AIR SAMPLES

MEDIUM	TYPE	PARAMETER	ANALYTICAL METHODS
Air	Cassette	Lead	NIOSH 7300

PHYSICAL PROPERTIES

MEDIUM	TYPE	PARAMETER	ANALYTICAL METHODS
Soil	Composite	Sieve Analysis	ASTM C136
Soil	Composite	Sieve Analysis (washed)	ASTM D422 & D1140
Soil	Composite	Hydrometer Analysis	ASTM D422
Soil	Composite	Atterberg Limits	ASTM D4318
Soil	Composite	Natural Moisture Content	ASTM D2216
Soil	Composite	Bulk (natural) Soil Density	ACE EM-1110-2-1906, Appendix II
Soil	Composite	Specific Gravity	ASTM C127 and/or D854

SOIL TAL METALS RESULTS

	Statewide TAGM 4046 Guidelines	Maximum Senecawide Soil Background (1)													
COMPOUND			UNITS:	122B-1001A		122B-1002B		122B-1008A		122B-1009A		122B-1010A		122B-1011A	
METALS															
Aluminum	33000 (SB)	21000	ppm	7630		10800		13100		12300		4490		8500	
Antimony	None	12.5	ppm	4.9	J	0.74	J	0.48	J	0.60	J	109	J	670	J
Arsenic	7.5	21.5	ppm	4.8		4.1		7.6		7.6		6.0		84.6	J
Barium	300	159	ppm	87.4		84.3		63		83.5		25.4	J	61.7	
Beryllium	0.16	1.4	ppm	0.36	J	0.57	J	0.61	J	0.62	J	0.19	J	0.43	J
Cadmium	1	2.9	ppm	0.49	J	0.55	J	0.48	J	0.54	J	0.28	J	0.89	J
Calcium	None	293000	ppm	66700		23600		59700		40500		35200		28500	
Chromium	10	32.7	ppm	14.6		19.6		23.5		22.1		7.3		16.9	
Cobalt	30	29.1	ppm	5.9	J	7.8	J	11.0		10.1	J	3.8	J	7.6	J
Copper	25	62.8	ppm	71.5	J	27.8	J	30.4	J	31.7	J	28		5690	J
Iron	2000	38600	ppm	15100		19800		26200		25500		9130		17000	
Lead	200-500 (SB)	266	ppm	55.6		47.7		56.6		98.7		13100		88700	J
Magnesium	None	29100	ppm	24100		8770		12600		8500		10900		7310	
Manganese	50-5000 (SB)	2380	ppm	473		576		501		656		329		443	
Mercury	0.1	0.13	ppm	0.045	U	0.050	U	0.044	U	0.041	U	0.042	U	0.047	U
Nickel	13	62.3	ppm	14.8		18.5		34.9		31.1		7.6	J	20.8	
Potassium	(SB)	3160	ppm	1610		1690		1620		1620		937	J	1690	
Selenium	2	1.7	ppm	0.53	U	0.52	U	0.55	U	0.58	U	0.64	J	0.55	U
Silver	(SB)	1.6	ppm	0.31	U	0.30	U	0.32	U	0.33	U	0.37	J	3.4	J
Sodium	None	269	ppm	125	J	843	J	182	J	388	J	142	J	152	J
Thallium	(SB)	1.5	ppm	1.2	U	1.2	U	1.3	U	1.3	U	1.2	U	1.7	J
Vanadium	150	32.7	ppm	12.6		18.2		17.0		17.6		8.7	J	13.7	
Zinc	20	283	ppm	57.3		62.4		86.4		80.5		29.3		630	J

Notes:
Highlighted cells indicate exceedance of maximum Senecawide background.
(1) Based on statistics for Seneca-wide background soil results as of 2001.
SB - Site background
U - Not detected at reported concentration
J - Estimated Value

SOIL TAL METALS RESULTS

COMPOUND	Statewide TAGM 4046 Guidelines	Maximum Senecawide Soil Background (1)	UNITS:	122B-1011B		122B-1013A		122B-1013B		122B-1015A		122B-1018A		122B-1020A	
METALS															
Aluminum	33000 (SB)	21000	ppm	13400		10700		10100		5970		14300		4220	
Antimony	None	12.5	ppm	0.53	J	4.5	J	1.2	J	0.32	UJ	2.9	J	0.31	UJ
Arsenic	7.5	21.5	ppm	4.7		11.5		7.1		3.7		4.2		2.2	
Barium	300	159	ppm	110		86.3		78.2		42.4		129		23.7	J
Beryllium	0.16	1.4	ppm	0.68	J	0.56	J	0.54	J	0.42	J	0.81	J	0.21	J
Cadmium	1	2.9	ppm	0.85	J	0.90	J	0.80	J	0.06	U	0.86	J	0.06	U
Calcium	None	293000	ppm	39900		44500		67200		191000		12900		63200	
Chromium	10	32.7	ppm	23.5		21.8		19.4		11		22.6		7.4	
Cobalt	30	29.1	ppm	11.6		10.2	J	12.1		8.5	J	10.0	J	3.7	J
Copper	25	62.8	ppm	25.6		41.2		30.6		13.9		29.0		17.1	
Iron	2000	38600	ppm	24600		21200		20200		11400		22500.0		8980	
Lead	200-500 (SB)	266	ppm	68		[redacted]		200		5.2		[redacted]		4.2	
Magnesium	None	29100	ppm	8200		14800		21500		11300		5700		19800	
Manganese	50-5000 (SB)	2380	ppm	716		562		601		387		789		330	
Mercury	0.1	0.13	ppm	0.054	U	0.056	U	0.055	U	0.049	U	0.049	U	0.051	U
Nickel	13	62.3	ppm	28.7		25.8		24.9		20.7		22.1		7	J
Potassium	(SB)	3160	ppm	2110		2280		1930		1280		1710		1100	
Selenium	2	1.7	ppm	0.58	U	0.60	U	0.59	U	0.52	U	0.61	U	0.5	U
Silver	(SB)	1.6	ppm	0.33	U	0.35	U	0.34	U	0.3	U	0.35	U	0.29	U
Sodium	None	269	ppm	146	U	150	U	148	U	131	U	154	U	127	U
Thallium	(SB)	1.5	ppm	0.42	U	0.44	U	0.43	U	0.69	J	0.45	U	0.37	U
Vanadium	150	32.7	ppm	20.1		17.6		17.2		10.1		25.3		7.6	J
Zinc	20	283	ppm	68.5		87.7		80.3		38		60.3		36.1	

Notes:
Highlighted cells indicate exceedance of maximum Senecawide background.
(1) Based on statistics for Seneca-wide background soil results as of 2001.
SB - Site background
U - Not detected at reported concentration
J - Estimated Value

TABLE 3.2

SOIL TAL METALS RESULTS

COMPOUND	Statewide TAGM 4046 Guidelines	Maximum Senecawide Soil Background (1)	UNITS:	122B-1024A		122B-1024B		122B-1025A		122B-1026		122B-1030		122B-1031	
[redacted]															
Aluminum	33000 (SB)	21000	ppm	3380		3040		3380		13900		14500		15000	
Antimony	None	12.5	ppm	0.77	J	0.61	J	0.83	J	1.3	UJ	1.4	UJ	1.6	UJ
Arsenic	7.5	21.5	ppm	1.4	J	1.8	J	1.8	J	2		2.6	J	3.3	J
Barium	300	159	ppm	19	J	14.5	J	18.4	J	83.2		95.3		92.8	
Beryllium	0.16	1.4	ppm	0.18	J	0.16	J	0.18	J	0.66	J	0.68	J	0.75	J
Cadmium	1	2.9	ppm	0.06	U	0.06	U	0.06	U	0.16	U	0.22	J	0.19	U
Calcium	None	293000	ppm	31800		31400		29500		26300		33400		30200	
Chromium	10	32.7	ppm	5.3		5.1		5.2		20.5		23.5		22.3	
Cobalt	30	29.1	ppm	2.7	J	2.9	J	2.8	J	9.4	J	9.9	J	10	J
Copper	25	62.8	ppm	[redacted]		22.2		44		22	J	28.7	J	29.5	J
Iron	2000	38600	ppm	6720		6570		6590		23900		28600		26500	
Lead	200-500 (SB)	266	ppm	69.4		14		57.4		11.3	J	212	J	145	J
Magnesium	None	29100	ppm	9980		8680		7720		6890		8220		7040	
Manganese	50-5000 (SB)	2380	ppm	280		285		284		605		510		604	
Mercury	0.1	0.13	ppm	0.049	U	0.053	U	0.053	U	0.046	U	0.047	J	0.041	U
Nickel	13	62.3	ppm	5.8	J	5.2	J	6	J	26.3		27.3		29.2	
Potassium	(SB)	3160	ppm	708	J	704	J	723	J	1990		1760		2160	
Selenium	2	1.7	ppm	0.55	U	0.52	U	0.56	J	0.57	U	0.59	U	0.69	U
Silver	(SB)	1.6	ppm	0.31	U	0.3	U	0.32	U	0.59	U	0.61	U	0.71	U
Sodium	None	269	ppm	137	U	130	U	140	U	156	J	106	U	123	U
Thallium	(SB)	1.5	ppm	0.4	U	0.74	J	0.5	J	0.91	U	0.94	U	1.1	U
Vanadium	150	32.7	ppm	5.7	J	5.3	J	5.6	J	20.7		23.4		23.7	
Zinc	20	283	ppm	31.9		25.3		30.1		74.1		70.9		78.6	

Notes:
Highlighted cells indicate exceedance of maximum Senecawide background.
(1) Based on statistics for Seneca-wide background soil results as of 2001.
SB - Site background
U - Not detected at reported concentration
J - Estimated Value

SOIL TAL METALS RESULTS

COMPOUND	Statewide TAGM 4046 Guidelines	Maximum Senecawide Soil Background (1)	UNITS:	122B-1036		122B-1040		122B-1041		122B-1042		122B-1046		122B-1053	
METALS															
Aluminum	33000 (SB)	21000	ppm	15100		13500		11800		14200		14100		9680	
Antimony	None	12.5	ppm	1.5	UJ	1.2	UJ	1.4	UJ	1.5	UJ	1.6	UJ	1.3	UJ
Arsenic	7.5	21.5	ppm	1.8	J	3.7		6	J	3.3	J	2.6	J	2.3	J
Barium	300	159	ppm	108		97.1		23.6	J	51.9		95.1		86.9	
Beryllium	0.16	1.4	ppm	0.79	J	0.56	J	0.42	J	0.62	J	0.66	J	0.37	J
Cadmium	1	2.9	ppm	0.18	U	0.18	J	0.25	J	0.25	J	0.2	J	0.16	U
Calcium	None	293000	ppm	23100		52100		68500		47100		14600		60400	
Chromium	10	32.7	ppm	23.1		23.9	J	21.4	J	26.8	J	22.1	J	18.3	J
Cobalt	30	29.1	ppm	10.1	J	10.4		10.7		13.2		9.3	J	6.9	J
Copper	25	62.8	ppm	22.6	J	17	J	15.3	J	19.9	J	21.6	J	18.1	J
Iron	2000	38600	ppm	26000		27600		26000		28700		23200		18800	
Lead	200-500 (SB)	266	ppm	12.7	J	6.5		8.5	J	10.6	J	18.8	J	10.8	J
Magnesium	None	29100	ppm	6770		9710		8000		8650		6110		15600	
Manganese	50-5000 (SB)	2380	ppm	670		457		608		519		539		493	
Mercury	0.1	0.13	ppm	0.054	U	0.05	U	0.053	U	0.046	U	0.063	U	0.055	U
Nickel	13	62.3	ppm	29.9		35.9		32		40.4		26.8		22.8	
Potassium	(SB)	3160	ppm	1890		2160		1570		2240		2310		1490	
Selenium	2	1.7	ppm	0.81	J	1.3	J	1.4	J	1.6	J	1.7	J	1.3	
Silver	(SB)	1.6	ppm	0.68	U	0.53	U	0.64	U	0.66	U	0.74	U	0.61	U
Sodium	None	269	ppm	141	J	91.6	U	110	U	113	U	127	U	105	U
Thallium	(SB)	1.5	ppm	1	U	0.82	U	0.98	U	1	U	1.1	U	0.93	U
Vanadium	150	32.7	ppm	23.2		18.4		15.7		19.1		22.8		16.1	
Zinc	20	283	ppm	74.9		52	J	63.6	J	103	J	77.3	J	55	J

Notes:
Highlighted cells indicate exceedance of maximum Senecawide background.
(1) Based on statistics for Seneca-wide background soil results as of 2001.
SB - Site background
U - Not detected at reported concentration
J - Estimated Value

SOIL TAL METALS RESULTS

	Statewide TAGM 4046 Guidelines	Maximum Senecawide Soil Background (1)					
COMPOUND			UNITS:	122B-1059		122B-1063	
METALS							
Aluminum	33000 (SB)	21000	ppm	13400		13700	
Antimony	None	12.5	ppm	1.7	UJ	1.4	UJ
Arsenic	7.5	21.5	ppm	3	J	1.9	J
Barium	300	159	ppm	104		84.7	
Beryllium	0.16	1.4	ppm	0.64	J	0.6	J
Cadmium	1	2.9	ppm	0.34	J	0.17	J
Calcium	None	293000	ppm	21200		20400	
Chromium	10	32.7	ppm	24.8	J	21.1	J
Cobalt	30	29.1	ppm	9.8	J	9.5	J
Copper	25	62.8	ppm	24.3	J	23.4	J
Iron	2000	38600	ppm	25500		24800	
Lead	200-500 (SB)	266	ppm	24.3	J	11.4	J
Magnesium	None	29100	ppm	5960		7190	
Manganese	50-5000 (SB)	2380	ppm	731		572	
Mercury	0.1	0.13	ppm	0.078	J	0.051	U
Nickel	13	62.3	ppm	28.4		30.2	
Potassium	(SB)	3160	ppm	2350		1650	
Selenium	2	1.7	ppm	1.7		1.3	
Silver	(SB)	1.6	ppm	0.79	U	0.62	U
Sodium	None	269	ppm	167	J	107	U
Thallium	(SB)	1.5	ppm	1.2	U	0.96	U
Vanadium	150	32.7	ppm	21.7		20	
Zinc	20	283	ppm	85.5	J	76.5	J

Notes:

Highlighted cells indicate exceedance of maximum Senecawide background.

(1) Based on statistics for Seneca-wide background soil results as of 2001.

SB - Site background

U - Not detected at reported concentration

J - Estimated Value

APPENDIX A

AMENDMENTS TO APPENDIX C (QAPP) OF:

Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army ɜpot Activity in Romulus, NY (Parsons, June 1995)

TABLE C-1

REQUIRED CONTAINERS, PRESERVATION AND HOLDING TIMES

	Containers[1]	Preservation	Maximum Holding Time (see Note A)		
except Mercury	G[5]	Cool, 4°C	180 days		
			From collection to TCLP extraction	From TCLP extraction to preparative extraction	From preparative extraction to analysis
olatiles	G[7]	Cool, 4°C	14 days	NA	14 days
emi-Volatiles	G[6]	Cool, 4°C	14 days	7	14 days
lercury	G[5]	Cool, 4°C	28 days	NA	28 days
letals, except Mercury	G[5]	Cool, 4°C	180 days	NA	180 days

Unless otherwise specified, holding time indicates time from sample collection.
Polyethylene (P) or Glass (G)
5 days from sample collection/40 days from extraction to analysis
500 ml glass container with polyethylene liner
250 ml amber glass container with Teflon-lined cap or closed end tube (i.e. brass sleeve)
3 40 ml glass vial with Teflon-lined cap (water), glass container or closed end tube (soil)

s Table amends: *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY* (Parsons, June 1995)

TABLE C-2
PARAMETER LIST FOR INORGANIC AND ORGANIC ANALYSES

: and Sediment Analyses	Preparation Method	Analytical Method	CRDL Limits (ug/Kg)
'ganics (TAL)			
.d	SW846	SW846 6010B	2000 [1]
:RA Characteristic Test			
itability	1110	1010 or 1020A	Table C-9
rrosivity Towards Steel	1110	9045C	Table C-9
:activity			Table C-9
›tal Releasable CN	9010B	9012A	Table C-9
›tal Releasable H_2S	9030	9034	Table C-9
‹traction Procedure Toxicity	1311		Table C-9
ɔxicity Characteristic Leaching Procedure			Table C-9
CL VOC	5035	8260B	Table C-9
CL SVOC	3550B	8270C	Table C-9
⊃B	3550B	8082	Table C-9
esticides		8081	Table C-9
ıorganics	3050B	6010B	Table C-9
1ercury	3050B	7471A	Table C-9

. CRDL for the Contract Laboratory Program.

'his Table amends: *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca \rmy Depot Activity in Romulus, NY* (Parsons, June 1995)

TABLE C-9
RCRA TARGET COMPOUND LIST
CONTRACT REQUIRED QUANTITATION LIMITS

rameter	Contract Required Quantitation Limits ug/l
Ignitability (°C or °F)	NA
Corrosivity Towards Steel (pH units)	NA
. Reactivity	
Total Releasable Cyanide as HCN	100,000
Total Releasable Sulfide as H_2S	100,000
. Extraction Procedure Toxicity; (EP Tox) (concentrations in extract)	
. Arsenic	1,000
. Barium	10,000
. Cadmium	100
. Total Chromium	1,000
. Lead	1,000
. Mercury	50
. Selenium	100
. Silver	1,000
. gamma-BHC (Lindane)	100
0. 2,4-Dichlorophenoxyacetic acid; (2,4-D)	1,000
1. Endrin	5
2. methoxychlor	1,000
3. 2,4,5-Trichlorophenoxy-propionic acid; (2,4,5-TP; Silvex)	
4. Toxaphene	100
. Toxicity Characteristic Leaching Procedure (TCLP) (concentrations in extract)	
Metals	
. Arsenic	1,000
2. Barium	10,000
3. Cadmium	100
4. Total Chromium	1,000
5. Lead	1,000
6. Mercury	50
7. Selenium	100
8. Silver	1,000

TABLE C-9
RCRA TARGET COMPOUND LIST
CONTRACT REQUIRED QUANTITATION LIMITS

ameter	Contract Required Quantitation Limits ug/l
atiles	
Benzene	10
2-Butanone (Methylethylketone)	10
Carbon tetrachloride	10
Chlorobenzene	10
Chloroform	10
1,2-Dichloroethane	10
1,1-Dichlroethylene	10
Tetrachloroethylene	10
Trichloroethylene	10
). Vinyl chloride	10
emi-Volatiles	
. 1,4-Dichlorobenzene	10
. 2,4-Dinitrotoluene	10
. Hexachorobenzene	10
. Hexachorobutadiene	10
. 2-Methylpenol (o-Cresol)	100
. 3-Methylpheno (m-Cresol)	10
. 4-Methylphenol (p-Cresol)	10
. Nitrobenzene	10
. Pentachlorophenol	5
0. Pyridine	100
1. 2,4,5-Trichlorophenol	10
2. 2,4,6-Trichlorophenol	10
esticides	
. gamma-BHC (Lindane)	10
. Chlordane	10
. 2,4-Dichlorophenoxyacetic acid; (2,4-D)	100
. Endrin	0.5
. Heptachlor	0.5
. Heptachlor epoxide	0.5
. Methoxychlor	100
. 2,4,5-Trichlorophenoxy-propionic acid; (2,4,5-TP; Silvex)	10
. Toxaphene	10

is Table amends: *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity Romulus, NY* (Parsons, June 1995)

TABLE C-10

Precision, Accuracy, and Completeness Goals for Laboratory Data

·asurement ·meter	Method Reference	Precision RPD			Accuracy % Rec.		Completeness
·-VOC[1]	NYSDEC CLP Statement of Work	Water	Soil		Water	Soil	
·hloroethene		14	22		61-145	59-172	90%
·chloroethene		14	24		71-120	62-137	
·zene		11	21		76-127	66-142	
·uene		13	21		76-125	59-139	
·orobenzene		13	21		75-130	60-133	
·Cs	Method 524.2	20	-		80-120	-	90%
·L-SVOC[1]	NYSDEC CLP Statement of Work	Water	Soil	Water	Soil		
·enol		42	35		12-110	26-90	90%
·Chlorophenol		40	50		27-123	25-102	
·4-Dichlorobenzene		28		27	36-97	28-104	
·-Nitroso-di-n-Propylamine		38	38	41-116	41-126		
·2,4 Trichlorobenzene		28		23	39-98	38-107	
·Chloro-3-Methylphenol		42		33	23-97	26-103	
·cenaphthene		31	19		46-118	31-137	
·-Nitrophenol		50	50		Oct-80	11-114	
·,4-Dinitrotoluene		38		47	24-96	28-89	
·entachlorophenol		50		47	9-103	17-109	
·yrene		31	36		26-127	35-142	
·CL-PESTICIDES/Arochlors[1]	NYSDEC CLP Statement of Work	Water	Soil		Water	Soil	
·amma-BHC		15	50		56-123	46-127	90%
·eptachlor		20	31		40-131	35-130	
·ldrin		22	43		40-120	34-132	
·ieldrin		18	38		52-126	31-134	
·ndrin		21	45		56-121	42-139	
·,4'-DDT		27	50		38-127	23-134	
·AL METALS[2]	NYSDEC CLP Statement of Work	Water	Soil		Water	Soil	
·3 Metals and Cyanide		50	100		75-125	75-125	90%

·otes:

· Values from NYSDEC ASP (June 2000): Matrix Spike Recovery and Relative Percent Difference Limits

· Values from EPA Region II Evaluation of Metals Data for the CLP Program (January 1992)

·his Table amends: *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca ·rmy Depot Activity in Romulus, NY* (Parsons, June 1995)

TABLE C-11
CALIBRATION CRITERIA

YSDEC CLP	Jarrell-Ash	Calibration at the beginning of each analytical series	3-t initial calibration standards	correlation > 0.995
ıtement of Work Metals by ›	Enviro II	Calibration check every 10 samples		calibration check within 10% of true value

ıs Table amends: *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY* ırsons, June 1995)

APPENDIX B

AMENDMENTS TO APPENDIX A (SAP) OF:

Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY (Parsons, June 1995)

AMMENDMENTS TO APPENDIX A OF: FIELD SAMPLING AND ANALYSIS PLAN

Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY (Parsons, June 1995).

1. **Section 2.1, Communications, Page A-3, Line 26:** DELETE paragraph "Field personnel must also contact the U.S. Army Corps of Engineers Missouri River Division (MRD) Laboratory in Omaha, Nebraska prior to the beginning of a field program if QA samples will be analyzed by MRD. The field personnel should obtain a LIMS number from the MRD sample custodian during this initial contact. MRD's phone number is (402) 697-2623."

   REPLACE with *"Field personnel must also contact the U.S. Army Corps of Engineers Environmental Laboratory, Environmental Chemistry Branch (ELECB) in Omaha, Nebraska prior to the beginning of a field program if QA samples will be analyzed by ELECB. The field personnel should obtain a Laboratory Information Management Systems (LIMS) number from the ECELB sample custodian during this initial contact. The point of contact and phone number for ECELB is Douglas Taggart 402.444.4300."*

2. **Section 2.1, Communications, Bullet 2, Page A-3, Line 35:** DELETE "....contracted laboratory and MRD's laboratory prior to..."

   REPLACE with *"...contracted laboratory and ECELB's laboratory prior to..."*

3. **Section 2.2, Sample Integrity Issues, Paragraph 3, Page A-5, Line 26:** DELETE "*Specifications and Guidance for Obtaining Contaminant-Free Sample Containers*, published by EPA's Office of Emergency and Remedial Response in April 1990"

   REPLACE with: *"Specifications and Guidance for obtaining Contaminant-Free Sample Containers published by the Office of Emergency and Remedial Response (EPA/540/R-93/051, December 1992)."*

4. **Section 2.3, Quality Control Samples, Paragraph 3, Page A-6, Line 16:** DELETE "USEPA Region II CERCLA Quality Assurance Manual",

   REPLACE with *"USEPA Region II CERCLA Quality Assurance Manual, (October, 1989)."*

5. **Section 2.4, Sample Numbering Scheme, Paragraph 3, Page A-8, Line 19:** DELETE "The general components of the numbering scheme are 1) matrix, 2)SWMU #, 3) location, and 4) sample #,"

REPLACE with "*The general components of the numbering scheme are 1) matrix, 2) SWMU #, and 3) sample #.*"

6. **Section 2.4, Sample Numbering Scheme, Paragraph 3, Page A-8, Line 25:** DELETE "Matrix-SMWU #- Location #. Sample #,"

   REPLACE with "*Matrix-SMWU #- Sample #.*"

7. **Section 2.4, Sample Numbering Scheme, Paragraph 3, Page A-8, Line 36:** DELETE line 36 which says "Location # is identified consecutively beginning with 1 for each matrix type."

8. **Section 2.4, Sample Numbering Scheme, Paragraph 3, Page A-8, Line 38:** DELETE "Sample # is identified consecutively beginning with .1 for each location,"

   REPLACE with: "*Sample # is identified consecutively where: Soil samples = 1000-1999, groundwater samples = 2000-2999, surface water samples = 3000-3999; and sediment samples are 4000-4999, Trip Blanks = 0001-0099, and field blanks = 0100-0199 (0999 available).*"

9. **Section 3.4.5, Health and Safety Procedures, Paragraph 2, Page A-34, Line 4:** RENAME this section "*Section 3.4.6 Health and Safety Procedures.*"

10. **ADD a new Section 3.4.5 titled: "*Section 3.4.5 Soil Pile Sampling,*"**

Representative samples from excavated soil piles consisting of sludges or other solid or liquid waste mixed with soil shall be obtained from a predetermined depth based on the known characteristics of the waste pile. Homogenous soil piles resulting from known operations may not require as extensive a sampling protocol as a heterogeneous soil pile where the composition and contaminants within the pile are unknown. A representative sample shall be collected from the soil pile using simple random sampling or stratified random sampling as defined in the USEPA Environmental Response Team Standard Operating Procedure (SOP) #2017 (Revision 1.0, March 2002).

Near surface samples shall be collected using a decontaminated shovel, trowel, scoop or spoon and depth samples with a decontaminated hand auger, sampling trier or grain sampler. Sampling equipment will be constructed of stainless steel, plastic or Teflon®. Equipment should be decontaminated in accordance with the Environmental Response Team/Response Engineering and Analytical Contract (ERT/REAC) SOP #2006, "*Sampling Equipment Decontamination,*" and the site-specific work plan.

Composite samples will be collected and placed into inert containers that will not react with the contaminants, or interfere with the analyses (i.e. stainless steel or Teflon® lined). The samples will be thoroughly mixed (homogenous) before the sample aliquot is transferred to an appropriate sample container (with the exception of soils for VOC analysis). Soils for VOC analysis will be transferred to an appropriate sample container immediately after sample collection and before mixing the soil.

State regulations do not require a specified number of samples per quantity of soil stockpiled, therefore, a proposed sampling plan must be submitted on a site-specific basis.

Soil piles requiring hazardous waste characterization will be analyzed by SW-846 methods for Resource Conservation and Recovery Act (RCRA) toxicity arameters. If a sample contains any of the RCRA contaminants at concentrations equal to or greater than the specified regulatory limit, the sample is said to demonstrate the characteristics of toxicity and will be disposed of as a hazardous waste. In addition, if the sample demonstrates the characteristics of ignitability, corrosivity, or reactivity it will be disposed of as a hazardous waste.

11. **Section 5.2, Packing and Shipping hazardous Samples Excluding those from Closed Containers, Bullet 3, Page A-159, Line 2:** DELETE "49 CFR 171, 172, 173, or 178,"

REPLACE with "*49 CFR parts 171 through 180.*"

APPENDIX C

LEAD COMPLIANCE PROGRAM

LEAD EXPOSURE COMPLIANCE PROGRAM

JOB NAME:	AIRFIELD SMALL ARMS RANGE TREATABILITY STUDY
LOCATION:	SENECA ARMY DEPOT ACTIVITY - ROMULUS, NY
JOB NO.	741401
DATE:	AUGUST 20, 2003
PREPARED BY:	DAN HOFFNER
APPROVED BY:	WILLIAM BRADFORD

NOTE: THIS DOCUMENT IS BEING ISSUED IN CONFORMANCE WITH 29 CFR 1926.62. THE DOCUMENT IS ORGANIZED PER 29 CFR 1926.62(e)(2). IT IS TO BE USED IN CONJUNCTION WITH THE PROJECT HEALTH AND SAFETY PLAN (HASP) AND PROJECT WORK PLAN. IF RESULTS FROM PERSONAL AIR SAMPLING INDICATE THAT NO WORKERS HAVE BEEN OR WILL BE EXPOSED ABOVE THE OSHA PERMISSIBLE EXPOSURE LIMIT (PEL) AS AN 8-HOUR TIME-WEIGHTED AVERAGE (TWA), THE PROJECT HEALTH AND SAFETY MANAGER MAY DECLARE THIS DOCUMENT NO LONGER APPLICABLE.

1. DESCRIPTION OF ACTIVITIES WHERE LEAD MAY BE EMITTED:

- Excavation of contaminated soils/debris.
- Mechanical separation of soils/debris.
- Sizing and stockpiling of soils/debris.
- Power screening of soils/debris.
- Sampling of stockpiles.
- Taking confirmatory samples.
- Loading of trucks.

2. CONTROLS IN PLACE:

- Isolation of the work zone.
- Natural outdoor ventilation.
- Dust suppression measures.
- Personal Protective Equipment (PPE).

3. EMPLOYEE JOB RESPONSIBILITIES:

Project Manager

To ensure that all personnel involved with projects which involve exposure to lead, are supplied with the appropriate PPE, training, and controls (where feasible); and to ensure exposure to lead is below recommended levels.

Site Supervisor/Foreman

To distribute appropriate PPE, training, and implement controls where feasible; and to advise employees, subcontractors, visitors, and the project manager of changing site conditions.

Employee/Subcontractor/Visitor

Understand and abide by all applicable training; comply with all signage; advise appropriate personnel of deficiencies in the program and/or new hazards on-site; and follow ALL Health and Safety rules at the facility and meet all the Health and Safety requirements of their contracts.

Corporate Health and Safety Manager

To assist the project manager in the implementation of the lead exposure compliance plan; and to aid in the training and scheduling appropriate physicals.

4. CREW SIZE:

4-6 field workers

5. OPERATING PROCEDURES:

- To the greatest extent possible, lead contaminated soil will not be disturbed in such a way as to generate any airborne lead. This means that activities generating large volumes of airborne dust will not be done.
- Once preparatory activities with the potential to disturb lead begin, lead exposure assessments (air monitoring) shall be conducted.
- Respiratory protection will be worn until negative assessments are determined.
- Lead contaminated soil will be disposed of as a hazardous waste if the total lead is >400 ppm and the leachable lead is >5 mg/L.
- All workers will follow personal hygiene practices including washing hands and face before taking breaks and lunch.
- See Work Plan for Scope of Work and site specific procedures.

6. MEANS TO CONTROL EXPOSURE:

- Natural ventilation.
- Dust suppression measures, such as spraying of water on soil, may be used, as needed.
- PPE, as required.
- Worker rotation, if necessary.

7. REPORT OF TECHNOLOGY CONSIDERED IN MEETING THE PEL:

The Permissible Exposure Limit (PEL) for this project is 50 micrograms per cubic meter of air averaged over an 8-hour period. The control measures noted above, monitoring of total dust, use of personal air sampling pumps, and use of PPE.

8. AIR MONITORING DATA:

Since the area is vegetated and undisturbed, there currently are no air emissions. Once work activities are started, air monitoring will be conducted as described in the Work Plan.

9. SCHEDULE FOR IMPLEMENTING LEAD CONTROL PLAN:

Upon initiation of the above-mentioned activities (description of activities where lead may be emitted).

10. WORK PRACTICE PROGRAM/PROCEDURES:

<u>Hygiene</u>

A. There will be no consumption of food or beverages; no smoking; and no cosmetic application in areas where employees are exposed to lead at or above the action level.

B. Clean change areas will be provided for employees whose airborne exposure to lead is above the action level and as interim protection for employees whose exposures are being evaluated.

C. The change areas will be equipped with separate storage facilities for protective work clothing and equipment and for street clothes.

D. Employees will not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

E. Employees will wash their hands and face at the end of the work shift, prior to leaving the site.

F. A lunch room/area will be designated on-site. All workers will exit the work zone for lunch. A clean area, free of lead contamination, outside of the work zone will be kept for drinking water.

G. All employees exposed to airborne lead will wash their hands and faces prior to eating, drinking, smoking, applying cosmetics, or leaving the site.

Personal Protective Equipment (PPE)

A. Respiratory Protection:

1. Respirator use will be necessary when air monitoring indicates that employee exposure is above the Action Level (30 micrograms per cubic meter of air averaged over an 8-hour time weighted average.
2. Respirators will be chosen on a task-specific basis based upon information in 29CFR1926.62. The selected respirator for this project is an approved ½ face air purifying respirator.
3. Until the lead exposure assessment has been performed, the employee will be treated as if their exposure is above the PEL.

B. Protective Clothing

1. Provision and Use:

   Where an employee is exposed to lead above the PEL without regard to the use of respirators, where employees are exposed to lead compounds which may cause skin or eye irritation (i.e., lead arsenate, lead azide), and as an interim protection for employees performing tasks while the lead exposure assessment is being performed, employees will be provided with and required to wear appropriate work clothing and equipment that prevent the contamination of the employee and the employee's garments. The protective clothing may include:

   a. Disposable coveralls or similar full-body work clothing;
   b. Gloves, hats, and shoes or disposable shoe coverlets; and
   c. Face shields and safety glasses, vented goggles, or other appropriate protective equipment.

2. Cleaning and Replacement:

   a. Protective clothing and equipment will be repaired or replaced as needed to maintain their effectiveness;
   b. Contaminated clothing will be placed in a closed container in the change area;
   c. Containers of lead contaminated protective clothing will be properly labeled; and

d. The removal of lead from protective clothing or equipment by blowing shaking, or any other means which disperses lead into the air is prohibited.

Training

All personnel are required to review the HASP and Work Plan. The Site Superintendent will meet with workers daily, prior to beginning site activities, to emphasize health and safety considerations. A longer meeting will be held at the beginning of each work week.

Personal Air Sampling

See Work Plan.

Medical Surveillance

Medical surveillance is covered in HASP (Appendix B of the Seneca Army Depot Activity *Generic Installation RI/FS Work Plan*; Parsons, 1995). If Lead exposure exceeds 0.03 mg/m^3 (as lead), all affected employees will have the required OSHA blood tests as a baseline. Such tests will be repeated every 6 months and upon employee exiting the project until the site safety manger determines that lead exposure has ended. Within 5 working days after the receipt of biological monitoring results, each employee will be notified in writing of his or her blood lead levels and any temporary requirements that may apply. All air monitoring records will be kept in the Syracuse office in job file #741401. Once exposure has begun, a IH or CSP will review all monitoring data.

11. ADMINISTRATIVE CONTROL SCHEDULE:

A worker rotation schedule will be implemented if activities are shown to continually exceed the PEL.

Response to Comments from the New York State Department of Environmental Conservation

Subject: Draft Characterization Report and Treatability Work Scope for the Airfield Parcel (SEAD-122B) Small Arms Range
Seneca Army Depot
Romulus, New York

Comments Dated: January 17, 2003

Date of Comment Response: March 6, 2003

The New York State Department of Environmental Conservation has reviewed the above referenced document dated October 2002. Comments are as follows:

General Responses

1. Ten comments (#16-25) are related to the proposed scope of the treatability study. These comments have been individually addressed. In an effort to make the proposed scope clearer, Section 4 has been revised. The new text is attached for review. Please note that the Army will be submitting a detailed work plan for the treatability study at a later date.

2. Section 3.2 Soil Sampling Results, has also been revised. Individual comments have been addressed and incorporated into the revised text. The new text is attached for review.

3. Section 3.4 Characterization Conclusions, has also been revised. The new text is attached for review.

General Comments

Comment 1: Considering that this is primarily a metals-contaminated soil site, the Department suggests that the treatability study concept be abandoned and the Army consider a more potentially cost-effective and efficient method for this site under the EPA Presumptive Remedy for Metals-in-Soils Sites guidance towards the development of a Proposed Plan and Record of Decision. By utilizing the presumptive remedy approach at this site it appears that significant time and cost savings will be achieved in comparison to the Army's current proposal. Numerous submittals may be eliminated such as treatability study work plans and post-study analysis reports, each requiring several iterations. Further, at the end of the treatability study, the Army must still complete a Proposed Plan, record of Decision, and perform the remedial action implementation. The NYSDEC encourages the Army to consider whether it is appropriate to move directly to the Proposed Plan at this point utilizing an applicable presumptive remedy. However, if the Army chooses to move forward with this treatability study, the Department suggests that the Army limit the area of consideration to a small portion of the floor and berm of the range so that the study may be completed in an expedited manner. (It is important that the Army recognizes that this treatability study should not be intended to be an effort which strives to remediate the entire site but rather is studying the potential of a certain technology. If the Army chooses to continue with a treatability study, then the necessary treatability study work plan, which the Army shall submit for regulatory review, should address the following comments, in addition to those provided below on the characterization report.

Response 1: The Army intends on moving forward with the treatability study. The Army assures the NYSDEC that it does recognize that this treatability study is not intended as an effort that strives to remediate the entire site, but rather is a study of the potential of a certain technology. Although NYSDEC believes that the Army is attempting to entirely remediate this site by excavating all contaminated soil, the Army is simply performing a treatability study to determine if size separation is an effective technology for removing lead contamination from soil at this small arms range. The Army believes that the proposed volume of soil excavation is necessary to properly evaluate the size separation technology on a pilot study scale. Reducing the amount of soil used in the study would compromise the evaluation.

In accordance with the BRAC process, the Army intends to transfer this site to the New York State Police for continued use of this property as a small arms range. This transfer will occur pursuant to a Finding of Suitability to Transfer (FOST) and the other requirements of CERCLA section 120(h), 42 U.S.C. § 9620(h), and the DoD land use control (LUC) policy.

The Army performed a characterization study at the site in June-July 2002, similar to a Phase I Remedial Investigation. This study demonstrated no impacted groundwater at or adjacent to the site, but some elevated lead concentrations, in soil, were detected along portions of the berm perimeter and isolated areas on the range floor and drainage swale. Now, the Army plans to continue the characterization process by performing the pilot-scale treatability study summarized in Section 4, to determine if particle separation is effective in removing lead-contamination and to support development of the most appropriate remedial alternatives. This treatability study will remove some contaminated soil to evaluate this technology, like a removal action that is performed simultaneously with the RI/FS.

Following completion of this treatability study, the Army will prepare a report of the pilot-scale treatability study results. At that time, the Army also expects to be well positioned to assess the further course of the RI/FS at this site and to recommend separately, with sufficient specificity, the balance of response activity appropriate for this site. As part of this document, the Army will propose, consistent with the proposed use of the site, whether and, if so, what kind of remedial or removal action should be performed at the site and, if so, what kind, for appropriate consideration by EPA and the NYSDEC.

The Army will definitely consider, at that time, the appropriateness of following the guidance in EPA/OSWER No. 9355.0-72FS, Presumptive Remedy for Metals-in-Soils Sites (Sep. 1999), as well as other guidance. Any remedial alternative selected by the Army for this site will be consistent with site closeout for small arms ranges or range management practices.

The *Characterization Report and Treatability Work Scope for the Seneca Army Depot Activity Small Arms Range Airfield Parcel (SEAD-122B)* will be revised consistent with these comments to more accurately state the Army's intent.

Comment 2: Since this is the first iteration of this document, the title should denote that it is a Draft document. Also, there are several inconsistencies throughout the document that need to be addressed. For instance, in Section 1.2, the berms are described as being constructed of primarily sandy fill soil, yet is Section 3.1, the berms are described as "silt with clay interbedded shale and traces of fine sand.gravel." In addition, it is unclear why "split samples for surface and subsurface soil and groundwater were collected for the Missouri River District for quality assurance purposes."

Response 2: A: The word "DRAFT" should have appeared on this document. Future documents will be labeled in accordance with the Federal Facilities Agreement.

B: The berms are constructed as stated in Section 3.1. Section 1.2 will be changed to reflect this.

C: Missouri River District, now Omaha District, is a laboratory program under the direction of the Army that has, as part of its mission, responsibility to perform comparative analysis on samples analyzed by contract laboratories. The Army requires this "split" in its contract with vendors such as Parsons. This text will be added to Section 2.5.

Comment 3: If the Army is continuing with the treatability study, they should investigate whether a screen of lesser size could be used to remove small fragmented particles of bullets that are likely to be picked up by birds as grit to lessen potential wildlife threats even further. This is especially important if the site is not used to for its purported use as state police shooting range and reverts to wildlife use which is its current use as evidenced by pictures in the report.

Response 3: The site was used by the Army, Navy and Air Force as a small arms range and will be used by the state police as a small arms range following this period of inactivity. The Army has received a letter from the Seneca County IDA stating the state police's intention to use this site as a small arms range. The goal of this treatability study will be to evaluate size separation effectiveness in treating lead concentrations in the soil to less than 400 ppm. The Army does not intend to remove all lead particles as long as the cleanup goals are achieved.

Comment 4: The NYSDOH requests further discussion and evaluation of antimony contamination of soil and groundwater. It is understood that antimony is a component of some ammunition and the Army must address the possibility that elevated levels at the site are attributed to prior activities at the range.

Response 4: A: Antimony can be used as a hardening agent in bullets. Antimony contamination in sample 1010A-109 ppm and 1011A-670 ppm are somewhat elevated with respect to the other samples. Samples 1010A and 1011A are within the proposed excavation area in the Pilot Study. Thus, even if they are slightly elevated, they will be excavated, characterized and if necessary, disposed of off-site as part of the Pilot Study. This discussion will be added to Section 3 (3.2.2.2; see new text).

B: Antimony in groundwater, while slightly elevated in comparison to Class GA groundwater standards, is seen in concentrations less than the highest Seneca background concentration. See new text in Section 3.4.

Specific Comments

Comment 5: Page iv, Listing of Acronyms: On page 3-2, the Army references NYSDEC TAGM 4046, but does not define TAGM in the list of acronyms.

Response 5: Technical and Administrative Guidance Memorandum (TAGM) will be added to the list of acronyms.

Comment 6: Page 1-2, Section 1.1, Purpose of Investigation Work: The first sentence beginning with "(P)arsons' experience" is extraneous and should be removed from the text. The following sentence beginning with "(T)his is consistent" should be revised accordingly.

Response 6: The sentence beginning with "Parsons experience…" will be replaced with "The Army has determined that for small arms ranges, the major issues are lead, and erosion. This is referenced in the document (*Prevention of Lead Migration and Erosion from Small Arms Ranges*, U.S. Army

Environmental Center's Range XXI Team and U.S. Army Training Support Center, August 1998). The sentence beginning with " This is consistent..." will be deleted.

Comment 7: Page 1-2, Section 1.2, Site Background: This section should present a description of the past use activities at the site, including users and dates, prior to the statement that the state police would use "the Airfield SAR for target practice needed for qualification of enforcement agency staff (similar to past use of the Airfield SAR)."

Response 7: Text describing the past use shall be inserted into Section 1.2 as follows: The Navy, Air Force and Army have operated the small arms range near the Seneca ADA airfield since the 1950's for small arms qualification of base and security personnel.

Comment 8: Page 1-2, Section 1.2, Site Background: In the last sentence of the third paragraph, the Army should indicate the stream classifications of Kendaia Creek and Indian Creek.

Response 8: Kenedia Creek and Indian Creek are classified as Class C fresh surface waters on the base property and change to Class CTS (trout spawing) downstream of the base. For reference, Kendaia Creek is 2 miles to the north of the site and Indian Creek is 3,000 feet to the east of the site. This will be incorporated into the revised text.

Comment 9: Page 1-2, Section 1.2, Site Background: In the second paragraph, the statement that "(N)o previous contaminant work had been done at this site ..." is incorrect and should be revised to reflect that surface soil sampling was performed as stated in the Final Investigation of Environmental baseline Survey Non-Evaluated Sites.

Response 9: The sentence beginning with "No previous contaminant..." will be deleted. A brief description of the previous work will be provided.

Comment 10: Page 2-1, Section 2.2, Site Monitoring Well Installation and Site Mapping: In the second sentence in this section, it is unclear whether the Army performed all of the proposed sampling, or whether "at most locations" refers to anywhere a soil sample was taken. Please clarify. Also, the last sentence in the third paragraph is confusing and should be revised.

Response 10: A. All proposed sampling was completed. The text will be clarified.

B. The last sentence of the 3rd paragraph will be revised as follows: The soil sample from each boring did not show any visual evidence of bullet fragments or elevated PID reading. Samples selected for further analysis (i.e. TCLP and SPLP analysis) were selected from the samples with the highest lead concentration.

Comment 11: Page 2-2, Section 2.2, Site Monitoring Well Installation and Site Sampling: Please identify at what intervals the wells were screened and whether a minimum of three well volumes were purged from the monitoring wells prior to sampling. Also, was turbidity one of the well development parameters? Please indicate.

Response 11: A. Well screen intervals can be found in Appendix A on the Drilling Record. The well screen intervals are as follows: MW-1 (6-16'), MW-2 (6-15.7') and MW-3 (4-14'). A minimum of three well volumes was purged from each of the wells. This is noted on the Sampling Record – Groundwater found in Appendix A.

B. Turbidity was a well development parameter as noted on the Well Development Reports found in Appendix A. Based on field conditions, it was concluded that the achieved turbidity was acceptable. This conclusion was made based on the fact that each well was developed for an hour or greater without any measured decrease in turbidity (> 1,000 NTU) and the fact that the lithological formation encountered was primarily made up of fine material (silt and clay) making the groundwater naturally turbid.

Comment 12: Page 3-1, Section 3: It should be identified in the text which "statewide guidelines or standards" were used for comparison.

Response 12: The text will be revised to read "Comparisons are made to NYSDEC TAGM 4046 guidance values. Seneca-wide metal background concentrations are used where TAGM values do not exist."

Comment 13: Page 3-1, Section 3.1, Soil Sampling Observations: The second bulleted item states that samples were collected "for the Missouri River District for quality assurances purposes." Please clarify.

Response 13: See part C of Response 2.

Comment 14: Page 3-2, Section 3.2, Soil Sampling Results: Please discuss the "background levels" that were exceeded for certain metals (i.e. sodium, calcium, and magnesium).

Response 14: A: Sodium, a non-hazardous metal, exceeded the maximum Seneca background (269 ppm) in two locations 1002B-343 ppm and 1009A-388 ppm. Sodium has no groundwater quality standard and the Seneca average background groundwater quality is 14,600 ug/L. As shown on Table 3.3, samples analyzed using the SPLP method including 1002B-14,800 ug/L and 1010A-20,800 ug/L exceeded the 14,600 ug/L background.

B: Calcium, a non-hazardous metal, had no exceedances (sample 1015A-191,000 ppm) of the maximum Seneca background level of 293,000 ppm. Calcium has no groundwater quality standard and the Seneca average background groundwater quality is 116,000 ug/L. The highest calcium concentration by SPLP analysis was sample 1002B (20,200 ug/L). The SPLP result falls well within the background groundwater quality.

C: Magnesium, a non-hazardous metal, had no exceedances of the maximum Seneca background level of 29,100 ppm. Magnesium has no groundwater quality standard and the Seneca average background groundwater quality is 28,600 ug/L. The highest magnesium concentration by SPLP analysis was sample 1002B (2,510 ug/L). The SPLP result falls well within the background groundwater quality.

Comment 15: Page 3-3, Section 4.3, Characterization Conclusions: This section should discuss the elevated levels of copper that were detected, in comparison to TAGM levels. Also, this section should recognize that antimony and iron exceeded ARARs instead of simply being "present in high background concentrations."

Response 15: A. Copper is a component in shell casings and jackets. Exceedances of the maximum Seneca background (62.8 ppm) was found in samples 1001A-71.5 ppm, 1011A-5,690 ppm, and 1024A-75 ppm. Sample 1011A is within the proposed excavation area for the Pilot Study.

B. Antimony is discussed in response #4.

C. Iron, a non-hazardous metal, had no exceedances of the guideline of 36,500 ppm. It did however have several exceedances of the Class GA Groundwater Standard (300 ug/L) when analyzed by SPLP methods. The highest result (sample 1011A, 2,030 ug/L) is within the proposed excavation area for the Pilot Study.

Comment 16: Page 4-1, Section 4, Treatability Work Scope: In the second paragraph the phrase "soil management" should be replaced with "remediation." This also should be addressed elsewhere in the document where applicable.

Response 16: "Soil management" will be replaced by "additional treatability work (excavation, screening, confirmation sampling)". See revised text for Section 4 which is attached for review.

Comment 17: Page 4-1, Section 4, Objectives of Treatability Testing: It is stated that the objectives of the treatability testing is to "evaluate technologies that can remove or stabilize lead." However, the Army is proposing to use gravity separation as pretreatment, followed by stabilization. The use of stabilization is more of a remedial action, not a treatability study, and the reference to stabilization in this treatability study scope if inappropriate. Also, what other technologies is the Army going to use for a comparison.

Secondly, given the large amount of oversized material generated from the screening/separation activities performed at the Open Burning Grounds, the Army should discuss the potential for a similar scenario to occur at the Airfield.

Response 17: A: The treatability study objectives presented in Section 4.1 are incorrectly stated. This Section will be revised to reflect the objective, as stated in the first sentence of Section 4.3, of assessing the effectiveness of mechanical removal of bullets from range soils. Following the pilot study, the site will be transferred to the State Police for continued use as a small arms range.

B: References to stabilization will be removed. New text for Section 4 is attached.

C: As stated in response to item #1, the presumptive remedy/technology of separation followed by off-site transportation and disposal will be evaluated. No other technologies comparison is required.

D: The Army does not anticipate uncovering large quantities of oversized materials at this site. Oversize materials that are encountered will either be reused as backfill, if clean, or disposed offsite, if contaminated, immediately after the treatability study is completed.

Comment 18: Page 4-2, Section 4.2, Treatability Work Summary: This section references work performed at the former Griffiss Air Force Base. However, the NYSDEC project manager for the Griffiss site is unaware of any such work being performed at Griffiss, nor of any documentation supporting such. Please remove this reference from the text or supply adequate supporting documentation.

Response 18: The reference to work performed at Griffiss will be removed. However, the referenced work was completed at the Small Arms Range/Hardfill 49A area and Mr. Jon Greco of the NYSDEC was the project manager. Mr. Doug Pocze was the project manager for the USEPA.

Comment 19: Page 4-2, Section 4.3, Task Descriptions: It is stated that "(E)ffectiveness will be measured in recovery of bullets, cost of operation, and soil quality following removal." The Army should assess the effectiveness of this technology versus other potential technologies such as soil washing, excavation, etc. Also, how can the Army determine the amount (i.e. percentage) of bullets recovered? Please explain.

Response 19: The Army does not need to assess the effectiveness of the screening technology versus other methods. Screening/separation is an accepted presumptive remedy (EPA, Presumptive Remedy for Metals-in Soil Sites, September 1999). The pilot study will assess the effect of varying screen sizes in the soil type at this site. Bullet recovery will be measured in weight (i.e. the weight of the recovered bullets versus the weight of the soil processed).

Comment 20: Page 4-2, Section 4.3, Task Descriptions: In the first bulleted item, in the statement the "(T)he US Army guidance for small arms ranges (US Army, 1998) recommends such a removal be a minimum of two feet in depth," it should be clarified which type of guidance (e.g. soil management for active ranges versus remediation for closed ranges, etc.) is being referenced. In the seconded bulleted item, it is unclear what the basis is for the proposal to remove 3 inches of soil instead of 4 inches or 6 inches. Please explain. In the third bulleted item, the soil represented by the sampling points exhibiting contamination should be removed, not the sample points themselves. Please revise. Under Task 7, it is unclear that the "confirmatory sampling strategy agreed to with USEPA and NYSDEC for other Seneca sites," entails. Please expand.

Response 20: A: The guidance document reference is written for operation and maintenance of small arms ranges (no differentiation between active and closed ranges; *Prevention of Lead Migration and Erosion from Small Arms Ranges*, U.S. Army Environmental Center's Range XXI Team and U.S. Army Training Support Center, August 1998). The 3-inch soil removal from the range floor was selected based on professional judgment. The depth was selected to remove any potential surface contamination resulting from the Pilot Study operation. Regardless of the depth excavated, samples will be collected and analyzed following this removal for comparison to the cleanup standard of 400 ppm total lead.

B: The third bullet under Task 2 refers to isolated "hot spot" excavations. Since the lead concentrations >400 ppm are not widespread, these isolated areas will be removed to add additional soil for the pilot study. The areas around the sample points will be excavated, as stated. Again, regardless of the area and depth excavated, samples will be collected and analyzed following this removal for comparison to the cleanup standard of 400 ppm total lead.

C: In Task 7, the confirmatory sampling strategy will generally be the following: Three samples will be collected from the front face of the backstop/berm where the soil will be removed from the target impact areas. Two samples will be collected on the range floor where the pilot study operation will take place after the 3-inches of soil have been removed. Two samples will be collected from each area affected by samples 1013 and 1018 after the soil has been removed. These samples will be analyzed for total lead. The concentrations will be compared to a cleanup goal of 400 ppm total lead.

Additional detail of the confirmatory sampling program will be provided in the detailed treatability study work plan.

Comment 21: Page 4-4, Section 4.3, Task Descriptions: Under Schedule, the 30-day sampling notice to the regulatory agencies and the expected report submittal time frame should be added to the text.

Response 21: The schedule presented in Section 4.3 was intended to address the on-site time only. The 30-day sampling notification requirement will be added to the schedule. A report will follow approximately 90 days after completion of the pilot study.

Comment 22: Page 4-4, Section 4.3, Task Descriptions: It is unclear whether the proposed work is consistent with site closeout for small arms ranges or for range management practices. Also, if this treatability study is consistent with "work at small arms ranges reported by others," then why should this be considered a treatability study? Please explain.

Response 22: A: The proposed work is consistent with additional investigation needs. A treatability study using representative site soils is imperative to determine appropriate treatment methods at any site, as well as to predict actual scaleup and filed performance of the selected approach (ITRC, Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, January 2003).

B: Section 4.4 will be replaced. See attached revised Section 4 text.

Comment 23: Page 4-4, Section 4.4.1, Particle Separation: In the statement that screening "can remove the larger rocks and soil particles and therefore render this larger particle-size fraction as relatively lead-free, it should be noted that, as with the OB Grounds, all soil will be sampled and cleaned prior to backfill.

Response 23: Soil will be sampled and analyzed prior to use as backfill as noted in Section 4.2 of the revised Section 4 text. Section 4.4.1 will be replaced. See attached revised Section 4 text.

Comment 24: Page 4-7, Section 4.5, Placement of Treated Material: In the statement the "(S)eparated rocks and debris will be left at the site," it should be noted that, as with the OB Grounds, all soil will be sampled and cleaned prior to backfill.

Response 24: Section 4.5, Placement of Treated Material, will be replaced. See attached revised Section 4 text.

Comment 25: Page 4-8, Section 4.7, Management of Treatability Test Derived Wastes: In this section, it states that "no liquid wastes are anticipated." Does the Army plan on performing decontamination activities? What does the Army propose to do with the decontamination water?

Response 25: Decontamination shall consist of removing loose soil and debris from the construction equipment. A temporary decon station will be constructed for water rinsing. The decon water will be collected and disposed of off-site. See Section 4.7 of revised text.

Comment 26: Figure 1-2: This figure should be revised to indicate the property boundaries of the former Seneca Army Depot.

Response 26: Figure 1.2 will be revised to show the property boundaries.

Comment 27: Table 3.1: The table should denote the depth at which soil samples 1030 and 1031 were taken.

Response 27: Table 3.1 will be revised to show sample depths. Sample 1030 is 0-2' bgs and sample 1031 is 10-12' bgs.

Comment 28: Figures 3.1 and 3.2: These figures are not legible. Please enlarge.

Response 28: Figures 3.1 and 3.2 will be enlarged and included in the revised report.

3.2 SOIL SAMPLING RESULTS

Lead is the main contaminant of concern.

3.2.1 Lead Results

Soil samples were collected at locations on the range floor, the face of the berms, and from adjacent drainage swales on June 28 and 29, 2002. Figure 3.1 shows results of samples from 0 to 6-inch depth that showed total lead above 60 parts per million (ppm). Figure 3.2 shows the results of soil samples from the 18 to 24-inch depth interval and from the soil boring samples that exceeded 60 ppm total lead. Table 3.1 presents this data in tabular form. As seen in Figure 3.1 and Table 3.1, six of 25 surface soil samples exceeded 60 ppm. Of these, four of the samples were along the face of the berm, one was in a drainage area west of the small arms range, and one was on the floor of the small arms range.

The samples that exceeded 60 ppm of total lead ranged from 69.4 ppm to 88,700 ppm (sample 1011A). The 88,700 ppm is an isolated occurrence, as all of the other surface samples except one were below 1,200 ppm. Sample 1011B, taken from the same location at depth interval 18-24-inches was 68 ppm, indicating that the elevated concentration at sample 1011A can be considered just surface contamination. The only other sample greater than 1,200 ppm was sample 1010A (13,100 ppm). Sample 1010B, taken from the same location at depth interval 18-24-inches was 14.7 ppm, also indicating that the elevated concentration at sample 1010A can be considered just surface contamination.

Four of the surface soil samples showed lead concentrations greater than 400 ppm, which is the lead concentration generally accepted as being protective for residential land use. The two samples located at target height along the east side of the berm (impact area) showed the highest lead levels. The highest lead value was taken at location 1011A, taken at the southeastern perimeter of the small arms berm.

Sample 1018A taken from the drainage swale in the 0-6 inch interval showed lead at 927 ppm. Sample 1018B was 19 ppm in the 18-24-inch interval. Thus, the contamination is surficial only. Sample 1019A was collected further downstream and was 13.7 ppm. Thus, the end point (clean sample) was found. Soil from the drainage swale, from the range to sample 1019 will be excavated and used as part of the Pilot Study operation.

Only two samples taken from the 18 to 24-inch interval below ground surface showed total lead concentrations above 60 ppm (Figure 3.2 and Table 3.1). No samples at this depth showed lead concentrations equal to or greater than 400 ppm. Also seen is that one soil boring resulted in two samples above 60 ppm of lead (but less than 400 ppm). All other soil samples taken from the seven soil borings were below 60 ppm.

3.2.2 TAL Metals Results

TAL total metals analysis results are presented in Table 3.2. Sodium was detected at concentrations just above background levels. Sodium is not a chemical of potential concern in small arms ammunition.

3.2.2.1 Copper Results

Four of the surface soil samples showed copper above NYSDEC TAGM 4046 soil cleanup objectives. The highest copper value was 5,690 ppm, at sample location 1011A (0 to 6-inch depth) taken near the southeastern perimeter of the berm where lead was 88,700 ppm. Sample 1011A is within the proposed excavation area for the Pilot Study. The other copper concentrations were 75 ppm or less compared to the maximum Seneca background of 62.8 ppm for copper.

3.2.2.2 Antimony Results

Antimony was detected above the Seneca maximum background of 12.5 ppm in two samples. The highest concentration of antimony was 670 ppm, found at the same sample location 1011A (0 to 6-inch depth) where lead was 88,700 ppm. Sample 1011A is within the proposed excavation area for the Pilot Study.

Antimony can be used as a hardening agent in bullets. Antimony contamination in sample 1010A-109 ppm and 1011A-670 ppm are somewhat elevated with respect to the other samples. Samples 1010A and 1011A are within the proposed excavation area in the Pilot Study.

3.2.2.3 Iron Results

Iron, a non-hazardous metal, had no exceedances of the maximum Seneca soil background of 38,600 ppm.

3.2.2.4 Sodium Results

Sodium, a non-hazardous metal, exceeded the maximum Seneca soil background (269 ppm) in two locations 1002B-343 ppm and 1009A-388 ppm. However, sodium is not a potential chemical of concern is small arms ranges.

3.2.2.5 Calcium Results

Calcium, a non-hazardous metal, had no exceedances of the maximum Seneca soil background level of 293,000 ppm.

3.2.2.5 Magnesium Results

Magnesium, a non-hazardous metal, had no exceedances of the maximum Seneca soil background level of 29,100 ppm.

3.2.3 Leachable Metals Results

Leachable metal results based on the SPLP and TCLP are presented in Tables 3.3 and 3.4, respectively.

3.2.3.1 SPLP Metals Results

SPLP results for lead were above the groundwater standard of 25 ug/L for three surface soil samples, with the highest value of 334 ug/L seen at sample location 1011A. The other two samples (1010A-26.9 ug/L and 1018A-26 ug/L) exceeded the groundwater standard by a negligible amount (<2 ug/L). Sample 1011A and 1010A are within the proposed area of excavation for the Pilot Study.

Thallium exceeded groundwater standards during SPLP analysis at three surface soil locations. Thallium is a non-hazardous metal not associated with small arms ranges and does not exhibit any exceedances of the maximum Seneca background (1.2 ppm) for soil.

Antimony SPLP concentrations exceeded the groundwater standard of 3 ug/L at six surface soil sample locations, one of the deeper (18 to 24-inches bgs) soil sample locations, and one boring sample. The highest antimony SPLP value was 180 ug/L at sample location 1011A. Four of the eight sample locations are within the proposed area of excavation for the Pilot Study. Three samples are in the machine gun range, where antimony concentrations in soil are below the maximum Seneca background concentration. One sample (1002B, 5.4 ug/L) is on the firing line.

The iron SPLP leach results showed exceedances of the groundwater standard of 300 ug/L in several samples, with a high value of 2,030 ug/L, taken at sample location 1011A. Based on Seneca background groundwater quality of 4,480 ug/L, the iron results are well within the concentrations to be expected.

3.2.3.2 TCLP Metals Results

TCLP results (Table 3.4) showed a single exceedance of the RCRA limit for lead of 5,000 ug/L. This exceedance was seen at surface soil location 1011A, (99,900 ug/L). Location 1011A also showed that highest total lead concentration of 88,700 ppm. This TCLP result indicates that this sample is considered to be hazardous by characteristic. Sample 1011A is within the proposed area of excavation for the Pilot Study. All other TCLP results were below RCRA hazardous waste limits.

A complete list of characterization results is presented in Appendix C.

3.4 CHARACTERIZATION CONCLUSIONS

The analytical results indicate the following:

- Impacts attributable to Seneca Airfield range use are limited in nature and extent;
- Impacts are primarily related to the presence of lead in surface soil;
- Impacts are primarily concentrated along the inside perimeter of the berm, specifically the east end of the small arms berm, at/near target height;
- Limited migration of lead has ocurred as a result of the range drain pathways;
- Groundwater has not been impacted by range operations.

Lead results greater than 400 ppm were seen in four of 24 surface soil samples and in only three of the 63 subsurface samples. Lead is a naturally-occurring element and thus is persistent in the environment. Lead can also strongly adsorb to organic matter in soils. Note that lead results for the 18-inch to 24-inch depth are much lower than lead levels at the 0-inch to 6-inch depth where lead has impacted surface soils. The lead in surface soil at this site appears to have been retained strongly in surface soil, and lead has apparently not migrated to underlying groundwater. Lead has not been detected in site groundwater (Table 3.5).

Lead is the major constituent of concern. Antimony in soil is present but only in the areas where the lead concentration is high. Additional work is warranted at this site prior to turning the site over to another land user. The proposed treatability work scope is described in Section 4.

The groundwater data suggest the site has not impacted groundwater on-site or downgradient of the site. Antimony and iron are the only two metals in exceedance of groundwater standards. Iron concentrations are within the Seneca maximum background water quality concentrations. Antimony concentrations in groundwater are less than the maximum Seneca background concentration. It appears that no action is needed for site groundwater.

Based on the investigation results, the investigation-derived waste from the work reported herein appears to be manageable as part of the treatability study work scope. Soil from the monitoring wells can be managed with other soils from the site, and water extracted from the monitoring wells can be released on site to infiltrate back to the local groundwater.

SECTION 4

TREATABILITY WORK SCOPE

The following work scope is proposed by the Army to continue the Seneca Airfield Small Arms Range characterization. The Army recognizes that a more complete work plan for the treatability work will be required prior to initiating the work.

Some additional treatability work (excavation, screening, confirmation sampling) is needed at the Seneca Airfield SAR due to isolated areas where concentrations of lead found during the investigation were elevated as described in Section 3 of this report. The purpose of this section is to outline work activities for completing a treatabilty study of the impacted soils.

4.1 OBJECTIVES OF TREATABILITY TESTING

This treatability study will assess the effectiveness of mechanical removal of bullets from range soils to reduce lead concentrations in the soil. Effectiveness will be measured in recovery of lead bullets, cost of operation and soil quality following removal.

Following the treatability testing, confirmation sampling will be conducted to assess the range condition (soil quality) in areas where the excavation occurred. Confirmation sampling for lead concentrations in the remaining soils will be compared to the following guidance values:

- Total lead concentration of less than 400 mg/kg, which is a conservative residential action level that is protective of human health.

4.2 TREATABILITY WORK SUMMARY

Three areas (samples 1010A, 1011A and 1013A, Figure 3.1) along the face of the berm/backstop at the larger range near target height contain lead in soil greater than 400 ppm in the 0-6-inch range. Soil will be removed along the entire face of the berm where samples 1010A and 1011A are located. In addition, soil will be removed in the area surrounding sample 1013A.

One area (sample 1018A) in a drainage swale contains lead in soil greater than 400 ppm in the 0-6-inch range. Surface soil in this area will be excavated and used for the pilot test.

The removed/excavated soil will be processed using different size screens to remove bullets and/or bullet fragments.

Screened soil will be analyzed for total lead concentration following each size screening. Soil that contains 400 ppm or less of lead will be used as site backfill. Soil containing greater than 400 ppm total lead will be properly characterized and disposed of off-site.

Oversized material will be disposed of at an appropriate facility, as required. If TCLP results show leachable lead levels exceed 5 mg/L following screening of bullets and bullet fragments, the soil is considered hazardous, by characteristics and will be disposed of off-site as a hazardous waste.

Confirmatory sampling will be performed beneath and adjacent to removal areas and compared to a guidance value of 400 ppm total lead. The details of this work will be provided in the work plan.

Baffles in place within the range will be removed, as needed, prior to earthwork in order to provide access to the soils.

An erosion control blanket will be installed in the removal areas. After the site is transferred to the State of New York, the State will then modify the site for its own purpose.

No action is needed for site groundwater for reasons presented in Section 3.4 of this report.

4.3 TASK DESCRIPTIONS

This treatability work will assess the effectiveness of mechanical removal of bullets from range soils. A three-foot layer of the berm/backstop will be excavated and screened with various screen sizes. Effectiveness will be measured in recovery of lead bullets, cost of operation and soil quality following removal.

Task 1: Mobilization/Site Preparation

- Demolish the baffles and targets.
- Dispose of the pea gravel and miscellaneous demolition debris off-site.
- Clear and grub the area between the shooter platform and the berm/backstop.
- Construct a bermed and lined (10-mil poly) screening and decontamination area (100 feet by 100 feet).
- Bench-scale physical property and sieve analysis.

Task 2: Excavation – Estimated to be 750 cubic yards

- Remove three feet of soil from the berm/backstop in the designated areas in the small arms firing range (no soil removal in the machine gun range). This soil will be from three areas measuring in total approximately 200 feet by 20 feet by 3 feet (or 500 cubic yards). The US Army guidance for small arms ranges (US Army, 1998) recommends such a removal be a minimum of two feet in depth.
- Remove three inches of soil from the floor of the range, in areas affected by the pilot study operations (bermed area constructed in Task 1), between the firing line and the targets (to be done following all pilot study operations). This soil will be from an area approximately 120 feet by 120 feet by 0.25 feet (or 150 cubic yards).

- Remove six inches of soil from the floor of the drainage swale in the area where investigation results showed soil lead concentrations greater than 400 ppm (Sample ID 1018 on Figure 3.1).

Task 3: Lead/Bullet Particle Separation / Screening – for the 500 cubic yards excavated from the berm/backstop

- Remove lead bullets from the soil to mitigate range workers risk of dermal contact and dust inhalation. Removal of bullets will also reduce potential for lead migration to groundwater.
- Screen the excavated soil into three stockpiles using three different screen sizes to assess the effectiveness of the different screen sizes.
- Sample the screened/stockpiled soil for total lead and disposal characteristics if the total lead is greater than 400 ppm.

Task 4: Disposal – Dispose of soil with lead concentrations exceeding 400 ppm following removal of lead particles.

- As needed, load, transport and dispose of lead contaminated soils potentially impacted from treatability testing work (drainage swale, range floor and stockpiles with lead concentrations over 400 ppm). These soils will be disposed at a permitted off-site facility.

Task 5: Site Restoration

- Sample the berm/backstop face after excavation and prior to rebuilding/reshaping. Analyze for TAL metals. Sample locations will be identified in the Pilot Test Work Plan.
- Place an erosion control blanket over the berm/backstop and anchor into place an erosion control blanket to provide temporary erosion control until the site is transferred to the State of New York.

SCHEDULE – FIELD OPERATIONS

Tasks would be accomplished in series as follows:

Task 1: Mobilization/Site Preparation – 2 weeks from receiving a notice to proceed from the Army;

Task 2: Excavation – 1 week following completion of Task 1;

Task 3: Lead/Bullet Screening – 1 week following completion of Task 2;

Task 4: Disposal – 2 weeks following completion of Task 3;

Task 5: Site Restoration –1 week following completion of Task 6.

4.4 TREATABILITY DESCRIPTION

Best management practices have been established for small arms ranges (USEPA, no date; and US Army Corps of Engineers, 1998). The USEPA (1999) has also provided presumptive remedy guidance for addressing sites with metals in soil. The US Air Force (2000) has established a technical protocol for managing small arms ranges. The work scope provided herein is consistent with work at small arms ranges reported by others.

4.4.1 Particle Separation

Particle separation can include a variety of material handling techniques that historically have been used for initial processing of metal-bearing ores in the metallurgical industry. For this site, screening is the type of separation that will be evaluated. Evaluations at other small arms ranges have indicated up to approximately 80 percent of the lead at small arms ranges can be removed by sieving. Lead has a much higher specific gravity than most other minerals and metals that comprise soil. Gravity separation techniques, as compared to screening, can work well on uniform to particle-size feed from which the very fine particles (i.e., clays and silts) have been removed. For the Seneca Airfield Small Arms Range, fine particles appear from visual observations to make up much of the soil.

A screen will be used to separate differently-sized particles at the Seneca Airfield Small Arms Range. Passing soil over a screen with openings slightly larger than the largest lead shot fragment can remove the larger rocks and soil particles and therefore render this larger particle-size fraction as relatively lead-free. The soil that passes through the first screen is passed over a second screen with smaller openings to capture most of the lead projectiles and fragments and little of the soil. This screen may capture a large majority of the lead (up to 95 percent of the total mass of lead contaminants according to some studies) from the soil in a "concentrate" that is salable to a smelter. Thus, screening can be a simple way to remove a large portion of the lead at low cost.

The effectiveness of screening for lead removal will be assessed initially at the bench-scale before mobilizing screening equipment to the site.

4.5 TREATABILITY EQUIPMENT AND WORK SEQUENCE DETAILS

Treatability work at the Seneca Airfield Small Arms Range will be done with full-scale construction equipment. Prior to any treatability testing work, baffles in place at the Airfield Small Arms Range site will be demolished and disposed of off-site in order to reach the soil to be tested with construction equipment. No tree removal or access road construction will be needed. The only site preparation envisioned, other than removing the baffles, is constructing a pilot study/equipment decontamination area, and a small trailer with changing area, desk, chairs, and, if reasonably feasible, an electrical hookup.

Soil to be tested will be scraped along the berm at target level within the larger of the two ranges on site and two other locations where previous investigation results showed total lead concentrations were near or above 1,000 ppm, which are also the only areas shown to have over 400 ppm of lead in soil. None of the soil to be excavated is below the water table, so no temporary water management is needed. Upstream runoff from storm events will be routed around the stockpile(s) to avoid excessive contacting with soil to be treated.

Pre-Testing A laboratory bench-scale sieve test will be performed on representative berm soils. The bench-scale separation results will be used to determine initial screen mesh sizes to be used at the site. Weights and total lead content will be measured for each screened fraction.

Excavation, Stockpiling, and Hauling of Materials Materials will be excavated and stockpiled within the treatment area. Vegetation pulled with the soil will be staged separately as needed and used as erosion control cover. The weight of soil will be recorded. If needed, clean water will be applied to control airborne dust.

Particle Separation Excavated soil will be transferred to a bermed area where it will be screened. Bullets and bullet fragments will be separated from soil and recycled off site to the extent practical.

Placement of Treated Material Following particle separation, the re-usable soil (<400ppm total lead) will be returned to the berm face. Soil and oversize material will be transported to a permitted off-site facility. Separated bullet particles will be recycled. Separated rocks and debris will be left at the site.

4.6 DATA QUALITY AND REPORTING

Data validation will be performed in accordance with the most current editions of the USEPA Region II SOPs HW-2 and HW-7, with consideration for the methodology and project requirements. Methodology and project requirements will be defined in the Work Plan.

The treatability test report will include a description of bench-scale and pilot-scale procedures used, an assessment of the overall effectiveness of the treatment techniques evaluated, and development of recommendations for follow-up work.

The treatability test report will include the following components:

- Testing overview;
- Procedures used;
- Test results;
- Conclusions and recommendations.

4.7 MANAGEMENT OF TREATABILITY TEST DERIVED WASTES

Soil and residual materials sent to the treatability study laboratory will be disposed of appropriately. Residual, untreated solids from the site containing bullet fragments will also be handled properly through recycling or disposal. Screened lead particles that cannot be recycled will be properly managed. No liquid wastes are anticipated. Decontamination liquids, if any, will be collected and used for dust suppression on the soils disposed of off-site.

Response to Comments from the United States
Environmental Protection Agency

Subject: Draft Treatability Study Workplan for Airfield Parcel (SEAD-122B) Small Arms Range
Seneca Army Depot
Romulus, New York

Comments Dated: November 3, 2003

Date of Comment Response: November 20, 2003

The United States Environmental Protection Agency has reviewed the above referenced document dated August 2003. Comments are as follows:

General Comments

Comment 1: The treatability study portion of the work plan indicates that approximately 750 cubic yards of soil will be mechanically screened and approximately 500 tons of soil will be disposed. Considering the large scope of removal, it is not clear whether this treatability study serves as a de facto removal action. It is also unclear whether the technology/procedure to be developed during the treatability study will be utilized at other areas of SEDA. Clarification of the way this treatability study fits into the CERCLA process should be provided.

Response 1: A: The general scope of work for the treatability study is identified in Section 1.2. The excavation will be approximately 750 cubic yards. The quantity of soil that will be disposed is not stated anywhere in the workplan. The intent, as described in Section 1.2 is to dispose of soil with lead concentrations exceeding 400 ppm.

B: With reference to the second part of this question, which refers to the clarification of how this study fits into the CERCLA process, this question has already been addressed in prior correspondence. As discussed in the September 2002 BCT meeting, the course of action was acceptable and upon the completion of the study, the final report will reassess the remaining contamination and the appropriate action IAW the FFA. Further, as stated in our "Response to Comments from the United States Environmental Protection Agency regarding the Draft Characterization Report and Treatability Work Scope for the Airfield Parcel (SEAD-122B) Small Arms Range, dated March 6, 2003" General Comments, Response 2:

> "In accordance with the BRAC process, the Army intends to transfer this site to the New York State Police for continued use of this property as a small arms range. This transfer will occur pursuant to a Finding of Suitability to Transfer (FOST) and the other requirements of CERCLA section 120(h), 42 U.S.C. § 9620(h), and the DoD land use control (LUC) policy."
>
> "The Army performed a characterization study at the site in June-July 2002, similar to a Phase I Remedial Investigation. This study demonstrated no impacted groundwater at or adjacent to the site, but some elevated lead concentrations, in soil, were detected along portions of the berm perimeter and isolated areas on the range floor and drainage swale. Now, the Army plans to continue the characterization process by performing the pilot-scale treatability study summarized in Section 4, to determine if particle separation is effective in removing lead-contamination and to support development of the most appropriate remedial alternatives. This

treatability study will remove some contaminated soil to evaluate this technology, like a removal action that is performed simultaneously with the RI/FS."

"Following completion of this treatability study, the Army will prepare a report of the pilot-scale treatability study results. At that time, the Army also expects to be well positioned to assess the further course of the RI/FS at this site and to recommend separately, with sufficient specificity, the balance of response activity appropriate for this site. As part of this document, the Army will propose, consistent with the proposed use of the site, whether and, if so, what kind of remedial or removal action should be performed at the site and, if so, what kind, for appropriate consideration by EPA and DEC."

We further believe that the Army received an indication of the EPA's acceptance of the Army's response in an Email from Mr. Julio Vazquez to Mr. Steve Absolom dated July 3, 2003. The pertinent text from that email is provided below:

"From: Vazquez.Julio@epamail.epa.gov
[mailto:Vazquez.Julio@epamail.epa.gov]
Sent: Thursday, July 03, 2003 3:56 PM
To: absoloms@seneca-hp.army.mil
Cc: gfmomber@gw.dec.state.ny.us; cmb18@health.state.ny.us;
Todd.Heino@parsons.com; Jeff.Adams@parsons.com
Subject: SEAD-122B Airfield SAR

Steve:
...
The response to our comments is acceptable."

Comment 2: There is a discrepancy regarding whether excavated soils will be sampled prior to screening. Section 2.4.1 indicates that pre-screened soils will be sampled, but Section 1.1.2, which provides the objective of the work, does not indicate that this sampling will be performed, nor does Section 3.4.1, which provides the detailed field procedures for screened and stockpiled soils. The text should be revised, to clarify not only the procedures that will be followed, but also, if pre- and post-treatment samples are planned. the way that the effectiveness of the treatment will be assessed.

Response 2: A: Soils intended for the treatability study will not be sampled or analyzed prior to excavation. This was already done as part of the site characterization. The results of the prior soil sampling and analysis were reported in the Draft Characterization Report, dated October 2002. Excavated soils will be sampled and analyzed prior to screening, as is stated in Sections 2.4 and 2.4.1 of the work plan. A statement will be added to Section 1.1.2 to clarify what types of sampling and analyses will be performed during each portion of the proposed effort.

B: Section 3.4.1 deals with waste characterization sampling and analysis, not pre-screening sampling and analysis. The words " and Stockpiled" will be deleted from the title of Section 3.4.1.

C: Clarification of the objectives of pre-screened soil sampling and analysis will be added to Section 3.1. Additional specific information pertinent to the sampling and analysis of recovered pre-screened soil samples will be provided in Section 3.3.

D: The effectiveness of the treatment will be assessed by comparing the total lead concentration of treated soils with untreated soils, by determining the weight of recovered bullets and bullet fragments in pounds, and by assessment of the costs of operation. The text regarding effectiveness will be clarified in Section 1.1.2 as stated herein.

Comment 3: For screened soils, Section 3.3 describes collection of five random samples from each stockpile using manual sampling methods. The screened soils will very likely be powdery. Depending on the manual methods used for sampling, it may prove difficult to obtain representative samples, particularly from the core of the pile. It may be preferable to spread the material and collect the samples for compositing by using a grid arrangement on the spread soils (NYSDEC, 1992).

Appendix B, Amendments to Appendix A of Field Sampling and Analysis Plan, is cited in the introduction to Section 3. Item 10 of this appendix refers back to Section 3.4.5 regarding soil pile sampling. The discussion there seems to imply that only screened soils will be sampled as the contention is made that homogeneous soil piles may not require as extensive a sampling protocol as heterogeneous ones. The discussion in this appendix also suggests that only near surface samples will be collected from the soil piles. Again, to obtain representative samples, it is preferable to composite samples collected throughout the entire pile volume, not just near the surface.

Response 3: A: Representative samples from the stockpiles will be obtained by collecting the five grab samples as the stockpiles are being generated. At approximately 30-35 cubic yard intervals during excavation and stockpiling, a sample will be taken from the stockpile as the stockpile is being created. The five grab samples will be composited into one sample for analysis.

B: Item 10 of Appendix B (Soil Pile Sampling) refers back to Section 3.4.5 of the *Generic Installation Remedial Investigation/Feasibility Study Work Plan for Seneca Army Depot Activity in Romulus, NY* (Parsons, June 1995). There is no Section 3.4.5 contained within this workplan.

C: Both pre-screened and screened soils will be sampled and analyzed. Please refer to clarifications as stated in Response to General Comment 2 above.

D: Item 10 of Appendix B gives guidance on how "near surface" and "depth" samples **may** be collected. Samples will be collected as stated in response 3A. This clarification will added to Section 3.3 of this workplan.

Comment 4: Excavation detail provided in Section A-A of Figure 3 shows there will be an overhang of soil after the proposed excavation is completed. It is not clear whether the proposed cut, a two-foot section starting at a height of ten feet will be stable or result in soil slumping or even pile failure. Additional detail or analysis should be provided including whether shoring is needed.

Response 4: The excavation will be gradually cut into the berm with the maximum depth being two feet. There will be no overhang. The drawing will be revised to show this.

Comment 5: The text does not state whether a work plan will be prepared or whether the treatability study scope of work will serve as the work plan for the treatability study. It is assumed that this is the work plan because the schedule on page 4-4 does not include work plan preparation. This issue should be clarified. Other issues that must be addressed include:

- Experimental design and procedures;
- Equipment and materials;
- Sampling and analysis plan (or cite approved SAP);
- A discussion of how this action will comply with Federal and State regulatory requirements;
- Data management (or cite approved QAPP);

- Data analysis and interpretation;
- Health and safety plan including dust monitoring (or cite approved plan);
- Community relations plan (or cite approved plan);
- Detailed erosion and sediment control measures; and
- Detailed dust control measures.

Response 5: A: This workplan is based on the treatability study work scope as contemplated and outlined in Section 4 of the *Draft Characterization Report and Treatability Work Scope for the Airfield Parcel (SEAD122B) Small Arms Range* as amended by new Section 4 attached to the Response to Comments dated March 6, 2003.

B: There is no page 4-4 in this workplan.

C: All bulleted items are addressed in the workplan as follows:

- Experimental design and procedures – No experimental designs or procedures are planned
- Equipment and materials – Section 2.14
- Sampling and analysis plan – Section 3
- A discussion of how this action will comply with Federal and State regulatory requirements – See general comment response 1B
- Data management – Section 2.7
- Data analysis and interpretation – Section 2.7
- Health and safety plan including dust monitoring – Section 2.11
- Community relations plan – Section 2.11
- Detailed erosion and sediment control measures – Section 2.1.3
- Detailed dust control measures – Section 2.1.4

Specific Comments

Comment 1: **Section 1.2, page 1-3.** This section states that the Airfield small arms range (SAR) has a network of footer drains that collect runoff from the berms. These drains discharge to an area west of the SAR. The drains are not clearly delineated on Figure 2.1, or 3.1. The drains should be added to the figure. In addition, the characterization report should state whether soil at the outfall(s) of these drains has been characterized.

Response 1: This comment was contained in the USEPA's earlier comment letter (January 10, 2003) on the Draft Characterization Plan and Treatability Work Scope. In our response to these comments the Army stated:

> The drains are shown on Figure 2.1 (they are noted as "approximate location of drainage swale"). The soil at the outfalls was characterized. Soil samples 1014, 1015, 1018 and 1019, were collected from the location shown on Figure 2.1. Total lead results for all samples except 1018 were below 60 ppm. Sample 1018 had a lead concentration of 927 ppm (see response 5). Section 3.2 will be revised to present the drainage swale analytical results. The text will be revised in Section 3.4 to conclude that "limited migration of lead has occurred as a result of the drain pathways."

Based on the July 3, 2003 response from the USEPA to the Army (See reference above in Response to General Comment #1), we believe this response was accepted. This information will be contained in the Draft Final Characterization Report.

Comment 2: **Section 2.2, page 2-2.** This section states that well development continued until the wells projected clean, sediment-free water. According to the development reports provided in Appendix A, groundwater was turbid when development ended. A detailed discussion of well development procedures and the increased turbidity should be provided in the text.

Response 2: This comment was contained in the USEPA's earlier comment letter (January 10, 2003) on the Draft Characterization Plan and Treatability Work Scope. In our response to these comments the Army stated:

> "This section will be revised to state "A minimum of three well volumes was removed from the wells, as per standard well development procedures." The following discussion will also be included: Turbidity was monitored during monitoring well development. Monitoring wells were developed by pumping with an electric Waterra pump. Temperature, pH, electrical conductivity, and turbidity was measured every five minutes during development activities at each well."
>
> "Standard procedure calls for monitoring of the aforementioned field parameters and removal of water until the monitoring wells produce clean, sediment-free samples (50 NTU if possible) and field parameters (temperature, pH, and electrical conductivity) stabilize. Stabilization is considered to be reached when three temperature, pH, and electrical conductivity readings measured at least 10 minutes apart, are within 10% of each other and the level of turbidity has stabilized. If the field conditions preclude the above mentioned criteria, the monitoring well development methods and field conditions are then reviewed to determine whether the achieved turbidity is acceptable."
>
> "Based on field conditions, it was concluded that the achieved turbidity was acceptable. This conclusion was made based on the fact that each well was developed for an hour or greater without any measured decrease in turbidity (> 1,000 NTU) and the fact that the lithological formation encountered was primarily made up of fine material (silt and clay) making the groundwater naturally turbid."

Based on the July 3, 2003 response from the USEPA to the Army (See reference above in Response to General Comment #1), we believe this response was accepted. This information will be contained in the Draft Final Characterization Report.

Comment 3: **Figure 3.1.** This figure provides surface soil analytical results for lead. Sample 1018A was reported with a lead concentration of 927 ppm. This sample is not shown within either of the ranges. A discussion of the lead content of this sample should be provided in the text.

Response 3: There is no Figure 3.1 in this workplan. This comment was contained in the USEPA's earlier comment letter (January 10, 2003) on the Draft Characterization Plan and Treatability Work Scope. This comment was Specific Comment #5 of that letter. In our response to these comments, the Army stated:

> "Sample 1018A was collected in the drainage swale leaving the site. Sample 1018A had a concentration of 927 ppm in the 0-6-inch depth. Sample 1018B was 19 ppm in the 18-24-inch interval. Thus, the contamination is surficial only. Sample 1019A was collected further downstream and was 13.7 ppm. Thus, the end point (clean sample) was found. Soil from the drainage swale, from the range to sample 1019 will be excavated and used as part of the Pilot Study operation. This discussion will be added to Section 3."

Based on the July 3, 2003 response from the USEPA to the Army (See reference above in Response to General Comment #1), we believe this response was accepted. This information will be contained in the Draft Final Characterization Report.

Comment 4: **Figure 2.1.** This figure provides sample locations near the berms. The locations of samples 1010 and 1011 appear to be at the base of the berm. On Figure 3.1, these samples appear to be above the toe of scope of the berm. Figure 2.1 should be changed to indicate that the samples were collected in the face of the berm.

Response 4: There is no Figure 2.1 in this workplan. This comment was provided as Specific Comment #3 in the USEPA's comment letter on the Draft Characterization Report and Treatability Work Scope issued on January 10, 2003. In our response to these comments, the Army stated:

> "Figure 2.1 will be revised to better reflect the actual sampling location of samples 1010 and 1011."

Based on the July 3, 2003 response from the USEPA to the Army (See reference above in Response to General Comment #1), we believe this response was accepted. This information will be contained in the Draft Final Characterization Report.

Comment 5: **Section 2.3 Screening Operations.** The sample collection requirements for the pre-excavation testing of soils for physical properties must be provided in this Work Plan. Also, the analytical requirements pertaining to this testing should be specified on Table 1 and Appendix A: Tables C-l and C-2.

Response 5: Only one sample will be collected for physical property testing. Sample collection requirements will consist of a single sample being collected from the surface to 2-foot interval on the berm surface. This text will be added to Section 3. Analytical parameters for physical property testing will be added to Table 1.

Comment 6: **Section 2.4, 3.1 thru 3.4 and Table 1**. The text should be clarified to consistently state the scope of the proposed sampling. There is a discrepancy between Sections 2.4 and Section 3 in that the earlier text proposes sampling pre-screened soil stockpiles for lead whereas this is not mentioned in Section 3. In addition; the pre-screening soil sample's analytical requirements are not presented on Table 1, nor are the sampling requirements (number, location and collection procedure) discussed in this WP.

Response 6: Text will be clarified as requested. All sampling discussion will be moved to Section 3. See also response #2 to general comment #2 and response #5 to specific comment #5.

Comment 7: **Section 2.4.1 Sample Type, Number and Location.** Please provide the size of each of the stockpiles and the rationale used in selecting 5 grab, surface soil samples as appropriate for compositing into a single; post-screening sample for a stockpile of the size proposed. Will these 5 samples be obtained via simple random sampling or stratified random sampling? Will the same approach be used for the pre-screened soil samples and the post screening samples?

Response 7: A: The size of the stockpiles will be approximately 167 cubic yards each (500 cy divided into 3 piles as stated in Section 2.2).

B: The rationale used in selecting five (5) grabs to make up the composite is good engineering judgment. Composite sampling is used for heterogeneous mixtures where the distribution of contaminants is widespread and not easily predicted as detailed in the Technical/Regulatory Guideline Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, ITRC January 2003,
C: Samples will be collected as identified in response 3A to general comment 3.

D: The same approach will be used for both pre-screened and post-screened samples.

Comment 8: **<u>Section 2.6.2 Analytical Parameters.</u>** Please clarify the information presented in this section regarding the waste characterization toxicity tests required for disposal. Are results of the analyses of the TCLP extracts for VOC, SVOC, Pesticides and PCBs required by the off-site disposal facility given that Lead is the only contaminant of concern in these soils? Have previous total results for each of these constituents been evaluated (in conjunction with their % Moistures)to determine if the TC extract values could possibly exceed the regulatory concentration?

Response 8: A: The analytical parameters are selected and determined by the disposal facility as needed, to meet permit requirements. Most landfills require that soils to be disposed of as non-hazardous be tested for the parameters stated. When the landfill is selected, parameters that meet disposal facility requirements will be selected for testing and changes from the workplan, if any, will be noted in the final report.

B: Leachable metals (TCLP & SPLP methods) analysis has been done for the site characterization and is presented in Tables 3.3 and 3.4 of the *Draft Characterization Report and Treatability Work Scope for the Airfield Parcel (SEAD122B) Small Arms Range.*

Comment 9: **<u>Section 2.7.3 Quality Control.</u>** The specific types of analytical data as well as the frequency of conducting data validation should be specified.

Response 9: Data validation will be conducted for post-screening soil samples that will be used for backfill and confirmation soil samples. Both types of samples will be analyzed for total lead. The frequency of data validation is 100% (all samples to be validated).

Comment 10: **<u>Section 2.8.2 Decontamination Water.</u>** Will the water generated during this project be containerized prior to disposing via sprinkling onto those soils that will be disposed of off-site, until the analytical results are known?

Response 10: The decontamination water is not expected to be hazardous, based on the leachability results reported in the Draft Characterization Report, and will not be analyzed prior to disposal via sprinkling. The water may be containerized in drums or a holding tank prior to sprinkling.

Comment 11: **<u>Appendix A, Table C-l.</u>** The holding times presented should begin at the time of sample collection, not from the VTSR.

Response 11: Table C-1 will be amended to reflect that the holding time begins from the time of sample collection.

Comment 12: **<u>Appendix A, Table C-2.</u>** There is a discrepancy between the analytical methods specified here and those presented on Table 1. Verify whether SW846 methods or the SOW from the NYSDEC CLP will be employed by the lab.

Response 12: SW846 methods will be employed by the laboratory, as stated in Table 1. Table C-2 will be revised to reflect that EPA SW846 method will be used.

Comment 13: There is no information presented regarding the analytical laboratory that will perform this work. Demonstration of certification by NY State for the analytical constituents of interest must be provided. In addition, the types of deliverables needed to employ the Region 2 data validation procedures should be specified in this WP.

Response 13: A: The laboratory to be used is General Engineering Laboratories, LLC. They have been previously used at Seneca Army Depot. A copy of their certifications is attached. State of New York Department of Health dated June 6, 2003 and U.S. Army Corps of Engineers dated February 8, 2002.

B: A complete analytical package as, defined by the CLP will be delivered by the laboratory for every field sample and field QC sample. The deliverable package from the laboratory will contain theappropriate forms for each SW846 method performed, as specified in the CLP. For metal analysis, forms will be completed that include information on analytical results, initial and continuing calibration verification, blanks, ICP interference check, spike sample results, laboratory duplicate sample results, laboratory control sample results, ICP serial dilution results, detection limits, ICP linear range, and raw data. Text will be added to Section 3.

STATE OF NEW YORK DEPARTMENT OF HEALTH

Wadsworth Center The Governor Nelson A. Rockefeller Empire State Plaza P.O. BOX 509 Albany, New York 12201-0509

Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

LAB ID: 11501

June 06, 2003

MR. JAMES WESTMORELAND
GENERAL ENGINEERING LABORATORIES INC
PO BOX 30712
CHARLESTON SC 29417

Certificate Expiration Date: April 01, 2004

Dear Mr. Westmoreland,

Enclosed are the ELAP and/or NELAP Certificate(s) of Approval issued to your environmental laboratory for the current permit year. The Certificate(s) supersede any previously issued and are in effect through the expiration date listed above. Please carefully examine the Certificate(s) to insure that the category(ies), subcategory(ies), analyte(s) and method(s) for which your laboratory is approved are listed correctly, as well as verifying your laboratory's name, address, lead technical director and identification number.

Pursuant to regulation (Part 55-2 NYCRR), certificates must be posted conspicuously in the laboratory and shall, upon request, be made available to any client of the laboratory. Certificates remain the property of the New York State Department of Health and must be surrendered promptly on demand.

Please note that pursuant to Section 55-2.5(a) NYCRR, any misrepresentation of the analytes or subcategories for which your laboratory is approved may result in suspension, limitation or termination of said certification.

The National Environmental Laboratory Accreditation Conference (NELAC) further defines and limits the use of NELAP accreditation and the NELAP logo.

Please notify the ELAP office of any changes you feel need to be made to your certificate(s). We may be reached via email to elap@health.state.ny.us or by calling (518) 485-5570.

Sincerely,

Joyce Reilly
Administrative Assistant
Environmental Laboratory
Approval Program

NYS DOH - Wadsworth Center - ELAP - PO BOX 509 - Albany NY 12201-0509

Phone: (518) 485-5570 **www.wadsworth.org/labcert** **Fax: (518) 485-5568**

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER
Antonia C. Novello, M.D., M.P.H., Dr.P.H.

Expires 12:01 AM April 01, 2004
Issued April 25, 2003
Revised June 06, 2003

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. JAMES WESTMORELAND
GENERAL ENGINEERING LABORATORIES INC
2040 SAVAGE ROAD
CHARLESTON SC 29407 United States

NY Lab Id No: 11501
EPA Lab Code: SC00012

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards for the category ENVIRONMENTAL ANALYSES POTABLE WATER
All approved analytes are listed below:

Drinking Water Metals I

Arsenic, Total	EPA 200.7
	EPA 200.8
Barium, Total	EPA 200.7
	EPA 200.8
Cadmium, Total	EPA 200.7
	EPA 200.8
Chromium, Total	EPA 200.7
	EPA 200.8
Copper, Total	EPA 200.7
	EPA 200.8
Iron, Total	EPA 200.7
Lead, Total	EPA 200.8
Manganese, Total	EPA 200.7
	EPA 200.8
Mercury, Total	EPA 200.8
	EPA 245.1
Selenium, Total	EPA 200.8
Silver, Total	EPA 200.7
	EPA 200.8
Sodium, Total	EPA 200.7
Zinc, Total	EPA 200.7
	EPA 200.8

Drinking Water Metals II

Antimony, Total	EPA 200.8
Beryllium, Total	EPA 200.7
	EPA 200.8
Nickel, Total	EPA 200.7
	EPA 200.8
Thallium, Total	EPA 200.8

Drinking Water Non-Metals

Chloride	EPA 300.0
Color	EPA 110.2
Fluoride, Total	EPA 300.0
	EPA 340.2
Hydrogen Ion (pH)	EPA 150.1
Nitrate (as N)	EPA 300.0
Nitrite (as N)	EPA 300.0
Solids, Total Dissolved	EPA 160.1
Sulfate (as SO4)	EPA 300.0

Drinking Water Trihalomethanes

Bromodichloromethane	EPA 524.2
Bromoform	EPA 524.2
Chloroform	EPA 524.2
Dibromochloromethane	EPA 524.2

Serial No.: 19179

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Microextractibles	
1,2-Dibromo-3-chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Radiological Analytes	
Gross Alpha	EPA 900.0
Gross Beta	EPA 900.0
Photon Emitters	EPA 901.1
Radium-226	EPA 903.1
Radium-228	EPA 904.0
Strontium-89	EPA 905.0
Strontium-90	EPA 905.0
Tritium	EPA 906.0
Uranium	ASTM D5174-91
Volatile Aromatics	
1,2,4-Trichlorobenzene	EPA 524.2
1,2-Dichlorobenzene	EPA 524.2
1,3-Dichlorobenzene	EPA 524.2
1,4-Dichlorobenzene	EPA 524.2
2-Chlorotoluene	EPA 524.2
4-Chlorotoluene	EPA 524.2
Benzene	EPA 524.2
Bromobenzene	EPA 524.2
Chlorobenzene	EPA 524.2
Volatile Aromatics	
Ethyl benzene	EPA 524.2
Styrene	EPA 524.2
Toluene	EPA 524.2
Volatile Halocarbons	
1,1,1,2-Tetrachloroethane	EPA 524.2
1,1,1-Trichloroethane	EPA 524.2
1,1,2,2-Tetrachloroethane	EPA 524.2
1,1,2-Trichloroethane	EPA 524.2
1,1-Dichloroethane	EPA 524.2
1,1-Dichloroethene	EPA 524.2
1,1-Dichloropropene	EPA 524.2
1,2,3-Trichloropropane	EPA 524.2
1,2-Dichloroethane	EPA 524.2
1,2-Dichloropropane	EPA 524.2
1,3-Dichloropropane	EPA 524.2
2,2-Dichloropropane	EPA 524.2
Bromochloromethane	EPA 524.2
Bromomethane	EPA 524.2
Carbon tetrachloride	EPA 524.2
Chloroethane	EPA 524.2
Chloromethane	EPA 524.2
cis-1,2-Dichloroethene	EPA 524.2
cis-1,3-Dichloropropene	EPA 524.2

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All approved analytes are listed below:

Volatile Halocarbons

Dibromomethane	EPA 524.2
Methylene chloride	EPA 524.2
Tetrachloroethene	EPA 524.2
trans-1,2 Dichloroethene	EPA 524.2
trans-1,3-Dichloropropene	EPA 524.2
Trichloroethene	EPA 524.2
Trichlorofluoromethane	EPA 524.2
Vinyl chloride	EPA 524.2

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Benzidines	
3,3 -Dichlorobenzidine	EPA 625
Benzidine	EPA 625
Chlorinated Hydrocarbon Pesticides	
4,4 -DDE	EPA 608
4,4 -DDT	EPA 608
4,4-DDD	EPA 608
Aldrin	EPA 608
alpha-BHC	EPA 608
beta-BHC	EPA 608
Chlordane Total	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan sulfate	EPA 608
Endrin	EPA 608
Endrin aldehyde	EPA 608
Heptachlor	EPA 608
Heptachlor epoxide	EPA 608
Lindane	EPA 608
Toxaphene	EPA 608
Chlorinated Hydrocarbons	
1,2,4-Trichlorobenzene	EPA 625
2-Chloronaphthalene	EPA 625
Chlorinated Hydrocarbons	
Hexachlorobenzene	EPA 625
Hexachlorobutadiene	EPA 625
Hexachlorocyclopentadiene	EPA 625
Hexachloroethane	EPA 625
Demand	
Chemical Oxygen Demand	EPA 410.4
Haloethers	
4-Bromophenylphenyl ether	EPA 625
4-Chlorophenylphenyl ether	EPA 625
Bis (2-chloroisopropyl) ether	EPA 625
Bis(2-chloroethoxy)methane	EPA 625
Bis(2-chloroethyl)ether	EPA 625
Mineral	
Alkalinity	EPA 310.1
Chloride	EPA 300.0
Fluoride, Total	EPA 300.0
	EPA 340.2
Hardness, Total	EPA 200.7
Sulfate (as SO4)	EPA 300.0
Nitroaromatics and Isophorone	
2,4-Dinitrotoluene	EPA 625

Serial No.: 20488

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Nitroaromatics and Isophorone	
2,6-Dinitrotoluene	EPA 625
Isophorone	EPA 625
Nitrobenzene	EPA 625
Nitrosoamines	
N-Nitrosodimethylamine	EPA 625
N-Nitrosodi-n-propylamine	EPA 625
N-Nitrosodiphenylamine	EPA 625
Nutrient	
Ammonia (as N)	EPA 350.1
Kjeldahl Nitrogen, Total	EPA 351.2
Nitrate (as N)	EPA 300.0
	EPA 352.1
	EPA 353.2
Nitrite (as N)	EPA 300.0
Orthophosphate (as P)	EPA 300.0
	EPA 365.2
Phosphorus, Total	EPA 365.4
Phthalate Esters	
Benzyl butyl phthalate	EPA 625
Bis(2-ethylhexyl) phthalate	EPA 625
Diethyl phthalate	EPA 625
Dimethyl phthalate	EPA 625
Phthalate Esters	
Di-n-butyl phthalate	EPA 625
Di-n-octyl phthalate	EPA 625
Polychlorinated Biphenyls	
PCB-1016	EPA 608
PCB-1221	EPA 608
PCB-1232	EPA 608
PCB-1242	EPA 608
PCB-1248	EPA 608
PCB-1254	EPA 608
PCB-1260	EPA 608
Polynuclear Aromatics	
Acenaphthene	EPA 625
Acenaphthylene	EPA 625
Anthracene	EPA 625
Benzo(a)anthracene	EPA 625
Benzo(a)pyrene	EPA 625
Benzo(b)fluoranthene	EPA 625
Benzo(ghi)perylene	EPA 625
Benzo(k)fluoranthene	EPA 625
Chrysene	EPA 625
Dibenzo(a,h)anthracene	EPA 625
Fluoranthene	EPA 625

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Polynuclear Aromatics	
Fluorene	EPA 625
Indeno(1,2,3-cd)pyrene	EPA 625
Naphthalene	EPA 625
Phenanthrene	EPA 625
Pyrene	EPA 625
Priority Pollutant Phenols	
2,4,6-Trichlorophenol	EPA 625
2,4-Dichlorophenol	EPA 625
2,4-Dimethylphenol	EPA 625
2,4-Dinitrophenol	EPA 625
2-Chlorophenol	EPA 625
2-Methyl-4,6-dinitrophenol	EPA 625
2-Nitrophenol	EPA 625
4-Chloro-3-methylphenol	EPA 625
4-Nitrophenol	EPA 625
Pentachlorophenol	EPA 625
Phenol	EPA 625
Purgeable Aromatics	
1,2-Dichlorobenzene	EPA 624
	EPA 625
1,3-Dichlorobenzene	EPA 624
	EPA 625
Purgeable Aromatics	
1,4-Dichlorobenzene	EPA 624
	EPA 625
Benzene	EPA 624
Chlorobenzene	EPA 624
Ethyl benzene	EPA 624
Toluene	EPA 624
Total Xylenes	EPA 602
Purgeable Halocarbons	
1,1,1-Trichloroethane	EPA 624
1,1,2,2-Tetrachloroethane	EPA 624
1,1,2-Trichloroethane	EPA 624
1,1-Dichloroethane	EPA 624
1,1-Dichloroethene	EPA 624
1,2-Dichloroethane	EPA 624
1,2-Dichloropropane	EPA 624
2-Chloroethylvinyl ether	EPA 624
Bromodichloromethane	EPA 624
Bromoform	EPA 624
Bromomethane	EPA 624
Carbon tetrachloride	EPA 624
Chloroethane	EPA 624
Chloroform	EPA 624
Chloromethane	EPA 624

Serial No.: 20488

Property of the New York State Department of Health. Valid only at the address shown. Must be conspicuously posted. Valid certificates have a raised seal and may be verified by calling (518) 485-5570.

DOH-3317 (3/97)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER
Antonia C. Novello, M.d., M.p.h., Dr.p.h.

Expires 12:01 AM April 01, 2004
Issued June 06, 2003
Revised August 27, 2003

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. JAMES WESTMORELAND
GENERAL ENGINEERING LABORATORIES INC
2040 SAVAGE ROAD
CHARLESTON SC 29407 United States

NY Lab Id No: 11501
EPA Lab Code: SC00012

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards for the category
ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:

Purgeable Halocarbons	
cis-1,3-Dichloropropene	EPA 624
Dibromochloromethane	EPA 624
Methylene chloride	EPA 624
Tetrachloroethene	EPA 624
trans-1,2-Dichloroethene	EPA 624
trans-1,3-Dichloropropene	EPA 624
Trichloroethene	EPA 624
Trichlorofluoromethane	EPA 624
Vinyl chloride	EPA 624
Radiological Analytes	
Gross Alpha	EPA 900.0
Gross Beta	EPA 900.0
Radium-226	EPA 903.1
Residue	
Solids, Total	EPA 160.3
Solids, Total Dissolved	EPA 160.1
Solids, Total Suspended	EPA 160.2
Wastewater Metals I	
Barium, Total	EPA 200.7
	EPA 200.8
Cadmium, Total	EPA 200.7
	EPA 200.8

Wastewater Metals I	
Cadmium, Total	SW-846 6010B
	SW-846 6020
Calcium, Total	EPA 200.7
Chromium, Total	EPA 200.7
	EPA 200.8
Copper, Total	EPA 200.7
	EPA 200.8
	SW-846 6010B
	SW-846 6020
Iron, Total	EPA 200.7
Lead, Total	EPA 200.7
	EPA 200.8
Magnesium, Total	EPA 200.7
Manganese, Total	EPA 200.7
	EPA 200.8
Nickel, Total	EPA 200.7
	EPA 200.8
	SW-846 6010B
	SW-846 6020
Potassium, Total	EPA 200.7
	SW-846 6010B
Silver, Total	EPA 200.7
	EPA 200.8

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Wastewater Metals I	
Sodium, Total	EPA 200.7
Wastewater Metals II	
Aluminum, Total	EPA 200.7
	EPA 200.8
Antimony, Total	EPA 200.7
	EPA 200.8
Arsenic, Total	EPA 200.7
	EPA 200.8
	SW-846 6010B
	SW-846 6020
Beryllium, Total	EPA 200.7
	EPA 200.8
Chromium VI	SM 18-19 3500-Cr D
Mercury, Total	EPA 1631E
	EPA 245.1
	SW-846 7470A
Selenium, Total	EPA 200.7
	EPA 200.8
	SW-846 6010B
Vanadium, Total	EPA 200.7
Zinc, Total	EPA 200.7
	EPA 200.8
	SW-846 6010B
Wastewater Metals II	
Zinc, Total	SW-846 6020
Wastewater Metals III	
Cobalt, Total	EPA 200.7
Molybdenum, Total	EPA 200.7
	SW-846 6010B
Thallium, Total	EPA 200.7
	EPA 200.8
Tin, Total	EPA 200.7
Wastewater Miscellaneous	
Boron, Total	EPA 200.7
Bromide	EPA 300.0
Color	EPA 110.2
Cyanide, Total	EPA 335.3
	EPA 335.4
Hydrogen Ion (pH)	EPA 150.1
Oil & Grease Total Recoverable	EPA 1664-A
	EPA 413.1
Organic Carbon, Total	EPA 415.1
Phenols	EPA 420.2
Sulfide (as S)	EPA 376.2

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All approved analytes are listed below:

Acrolein and Acrylonitrile	
Acrylonitrile	SW-846 8260B
Characteristic Testing	
Ignitability	SW-846 1010
	SW-846 1020
Reactivity	SW846 Ch7, Sec. 7.3
TCLP	FED REG 1311
Chlorinated Hydrocarbon Pesticides	
4,4 -DDE	SW-846 8270C
	SW-846 8081A
4,4 -DDT	SW-846 8270C
	SW-846 8081A
4,4-DDD	SW-846 8270C
	SW-846 8081A
Aldrin	SW-846 8081A
alpha-BHC	SW-846 8270C
	SW-846 8081A
beta-BHC	SW-846 8270C
	SW-846 8081A
Chlordane Total	SW-846 8081A
delta-BHC	SW-846 8270C
	SW-846 8081A
Dieldrin	SW-846 8270C
Chlorinated Hydrocarbon Pesticides	
Dieldrin	SW-846 8081A
Endosulfan I	SW-846 8270C
	SW-846 8081A
Endosulfan II	SW-846 8270C
	SW-846 8081A
Endosulfan sulfate	SW-846 8270C
	SW-846 8081A
Endrin	SW-846 8270C
	SW-846 8081A
Endrin aldehyde	SW-846 8270C
	SW-846 8081A
Heptachlor	SW-846 8270C
	SW-846 8081A
Heptachlor epoxide	SW-846 8270C
	SW-846 8081A
Lindane	SW-846 8270C
	SW-846 8081A
Methoxychlor	SW-846 8081A
Chlorinated Hydrocarbons	
1,2,4-Trichlorobenzene	SW-846 8270C
2-Chloronaphthalene	SW-846 8270C
Hexachlorobenzene	SW-846 8270C
Hexachlorobutadiene	SW-846 8270C

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Chlorinated Hydrocarbons	
Hexachlorocyclopentadiene	SW-846 8270C
Hexachloroethane	SW-846 8270C
Chlorophenoxy Acid Pesticides	
2,4,5-T	SW-846 8151A
2,4,5-TP (Silvex)	SW-846 8151A
2,4-D	SW-846 8151A
Dicamba	SW-846 8151A
Haloethers	
Bis (2-chloroisopropyl) ether	SW-846 8270C
Bis(2-chloroethoxy)methane	SW-846 8270C
Metals I	
Barium, Total	SW-846 6010B
	SW-846 6020
Cadmium, Total	SW-846 6010B
	SW-846 6020
Chromium, Total	SW-846 6010B
	SW-846 6020
Lead, Total	SW-846 6010B
	SW-846 6020
Nickel, Total	SW-846 6010B
	SW-846 6020
Silver, Total	SW-846 6010B
Metals I	
Silver, Total	SW-846 6020
Metals II	
Antimony, Total	SW-846 6010B
	SW-846 6020
Arsenic, Total	SW-846 6010B
	SW-846 6020
Mercury, Total	SW-846 7470A
	SW-846 7471A
Selenium, Total	SW-846 6010B
Miscellaneous	
Cyanide, Total	SW-846 9014
	SW-846 9010B
Hydrogen Ion (pH)	SW-846 9040B
	SW-846 9045C
Nitroaromatics and Isophorone	
2,4-Dinitrotoluene	SW-846 8270C
2,6-Dinitrotoluene	SW-846 8270C
Isophorone	SW-846 8270C
Nitrobenzene	SW-846 8270C
Phthalate Esters	
Benzyl butyl phthalate	SW-846 8270C

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Phthalate Esters	
Bis(2-ethylhexyl) phthalate	SW-846 8270C
Diethyl phthalate	SW-846 8270C
Dimethyl phthalate	SW-846 8270C
Di-n-butyl phthalate	SW-846 8270C
Di-n-octyl phthalate	SW-846 8270C
Polychlorinated Biphenyls	
PCB-1016	SW-846 8082
PCB-1221	SW-846 8082
PCB-1232	SW-846 8082
PCB-1242	SW-846 8082
PCB-1248	SW-846 8082
PCB-1254	SW-846 8082
PCB-1260	SW-846 8082
Polynuclear Aromatic Hydrocarbons	
Acenaphthene	SW-846 8270C
	SW-846 8310
Acenaphthylene	SW-846 8270C
	SW-846 8310
Anthracene	SW-846 8270C
	SW-846 8310
Benzo(a)anthracene	SW-846 8270C
	SW-846 8310

Polynuclear Aromatic Hydrocarbons	
Benzo(a)pyrene	SW-846 8270C
	SW-846 8310
Benzo(b)fluoranthene	SW-846 8270C
	SW-846 8310
Benzo(ghi)perylene	SW-846 8270C
	SW-846 8310
Chrysene	SW-846 8270C
	SW-846 8310
Dibenzo(a,h)anthracene	SW-846 8270C
	SW-846 8310
Fluoranthene	SW-846 8270C
	SW-846 8310
Fluorene	SW-846 8270C
	SW-846 8310
Indeno(1,2,3-cd)pyrene	SW-846 8270C
	SW-846 8310
Naphthalene	SW-846 8270C
	SW-846 8310
Phenanthrene	SW-846 8270C
Pyrene	SW-846 8270C
	SW-846 8310
Priority Pollutant Phenols	
2,4,6-Trichlorophenol	SW-846 8270C

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Priority Pollutant Phenols	
2,4-Dichlorophenol	SW-846 8270C
2,4-Dimethylphenol	SW-846 8270C
2,4-Dinitrophenol	SW-846 8270C
2-Chlorophenol	SW-846 8270C
2-Methyl-4,6-dinitrophenol	SW-846 8270C
2-Nitrophenol	SW-846 8270C
4-Chloro-3-methylphenol	SW-846 8270C
4-Nitrophenol	SW-846 8270C
Pentachlorophenol	SW-846 8270C
Phenol	SW-846 8270C
Purgeable Aromatics	
1,2-Dichlorobenzene	SW-846 8270C
	SW-846 8021B
	SW-846 8260B
1,3-Dichlorobenzene	SW-846 8270C
	SW-846 8021B
	SW-846 8260B
1,4-Dichlorobenzene	SW-846 8270C
	SW-846 8021B
	SW-846 8260B
Benzene	SW-846 8021B
	SW-846 8260B
Chlorobenzene	SW-846 8260B
Purgeable Aromatics	
Ethyl benzene	SW-846 8021B
	SW-846 8260B
Toluene	SW-846 8021B
	SW-846 8260B
Total Xylenes	SW-846 8021B
	SW-846 8260B
Purgeable Halocarbons	
1,1,1-Trichloroethane	SW-846 8260B
1,1,2,2-Tetrachloroethane	SW-846 8260B
1,1,2-Trichloroethane	SW-846 8260B
1,1-Dichloroethane	SW-846 8260B
1,1-Dichloroethene	SW-846 8260B
1,2-Dichloroethane	SW-846 8260B
1,2-Dichloropropane	SW-846 8260B
2-Chloroethylvinyl ether	SW-846 8260B
Bromodichloromethane	SW-846 8260B
Bromoform	SW-846 8260B
Bromomethane	SW-846 8260B
Carbon tetrachloride	SW-846 8260B
Chloroethane	SW-846 8260B
Chloroform	SW-846 8260B
Chloromethane	SW-846 8260B
cis-1,3-Dichloropropene	SW-846 8260B

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Purgeable Halocarbons

Dibromochloromethane	SW-846 8260B
Dichlorodifluoromethane	SW-846 8260B
Methylene chloride	SW-846 8260B
Tetrachloroethene	SW-846 8260B
trans-1,3-Dichloropropene	SW-846 8260B
Trichloroethene	SW-846 8260B
Trichlorofluoromethane	SW-846 8260B
Vinyl chloride	SW-846 8260B

Serial No.: 19181

DOH-3317 (3/97)

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

REPLY TO
ATTENTION OF:

COPY

February 8, 2002

Hazardous, Toxic and Radioactive Waste
Center of Expertise

General Engineering Laboratories, Inc.
ATTN: Robert Pullano
2040 Savage Road
Charleston, SC 29407

Gentlemen:

This correspondence addresses the recent evaluation of General Engineering Laboratories, Inc. of Charleston, SC, by the U.S. Army Corps of Engineers (USACE) for chemical analysis in support of the USACE Hazardous, Toxic and Radioactive Waste Program.

Your laboratory is now validated for the parameters listed below:

METHOD	PARAMETERS	MATRIX[1]
EPA 300	Anions[4]	Water[2]
9010B/9012A	Cyanide	Water[2]
9013/9014	Cyanide	Solids
8330	Explosives	Water[2]
8330	Explosives	Solids[2]
8151A	Herbicides	Water[2]
8151A	Herbicides	Solids
8081A	Organochlorine Pesticides	Water[2]
8081A	Organochlorine Pesticides	Solids
8082	Polychlorinated Biphenyls	Water[2]
8082	Polychlorinated Biphenyls	Solids[2]
8310	PAHs	Water[2]
8310	PAHs	Solids
8270C	Semivolatile Organics	Water[2]
8270C	Semivolatile Organics	Solids[2]
6010B/7000A	TAL Metals[3]	Water[2]
6010B/7000A	TAL Metals[3]	Solids[2]
9060	TOC	Water[2]
8015M	TPH-GRO/DRO	Water[5]
8015M	TPH-GRO/DRO	Solids[5]
8021B	Volatile Organics	Water[2]

8021B	Volatile Organics	Solids
8260B	Volatile Organics	Water(2)
8260B	Volatile Organics	Solids
906.0M	Tritium	Water(5)
905.0M	Sr89 & Sr90	Water(5)
905.0M	Sr89 & Sr90	Solids(5)
903.1M	Radium 226	Water(5)
903.1M	Radium 226	Solids(5)
904.0	Radium 228	Water(5)
904.0	Radium 228	Solids(5)
EMSL HASL-300,1982M	Total Alpha emitting Radium and Radium 228 in soil	Solids(5)
EMSL HASL-300-E-U-04-M	Isotopic determination of Americium, Curium, Plutonium & Uranium	Water(5)
EMSL HASL-300-E-U-04-M	Isotopic determination of Americium, Curium, Plutonium & Uranium	Solids(5)
DOE RP800 1997M, EML HASL-300, Pu02, 03M	Isotopic determination of Thorium	Water(5)
DOE RP800 1997M, EML HASL-300, Pu02, 03M	Isotopic determination of Thorium	Solids(5)
901.1M, DOE HASL-300	Gamma isotopes in water and soil	Water(5)
901.1M, DOE HASL-300	Gamma isotopes in water and soil	Solids(5)

Remarks:

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

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

3) 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. (Analysis by ICP/GFAA.)

4) Anions: nitrate, ortho-phosphate, chloride, sulfate, and fluoride.

5) Approval for the parameter is based on review of SOPs only

Based on the successful analysis of the performance evaluation samples and the outcome of the laboratory audit conducted by the Navy on March 27-29, 2001, your laboratory will be validated for sample analysis by the methods listed above. Note that any corrective action committed to by your laboratory as a result of the Navy inspection will also apply to this USACE validation. The period of validation is 24 months and expires on February 8, 2004.

The USACE reserves the right to conduct additional laboratory inspection 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 of 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