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U.S. Army Corps of Engineers

Omaha District
Offutt AFB, Nebraska

SENECA ARMY DEPOT ACTIVITY
TIME SENSITIVE GEOPHYSICAL INVESTIGATION
OPEN DETONATION GROUNDS
SENECA COUNTY
ROMULUS, NEW YORK

Contract No. DACA45-98-D-0004
Task Order No. 0037

FINAL
WORK PLAN

May 2003

01M-0007

WESTON SOLUTIONS
Restoring Resource Efficiency

FINAL
WORK PLAN

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Prepared for:

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
Offutt AFB, Nebraska

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May 2003

W.O. No. 20074.515.037

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TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS
(continued)

Section **Page**

TABLE OF CONTENTS
(continued)

Section **Page**

TABLE OF CONTENTS
(continued)

Section **Page**

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

AOIs	areas of investigation
bgs	below ground surface
BIP	blown in place
CD	compact disc
COR	Contracting Officers Representative
CQCP	Contractor Quality Control Plan
DGM	digital geophysical mapping
DGPS	Differential Global Positioning System
DID	Data Item Description
DQO	Data Quality Objective
EE/CA	Engineering Evaluation/Cost Analysis
EM	Electromagnetic
ERCP	Emergency Response and Contingency Plan
ft	feet/foot
GIS	Geographical Information Systems
GPO	Geophysical Prove-Out
GPS	Global Positioning System
Hz	hertz
m	meter
mm	millimeter
mph	miles per hour
NYSDEC	New York State Department of Environmental Conservation
OBG	Open Burning Grounds
ODG	Open Detonation Grounds
OE	Ordnance and explosives
ORS	ordnance related scrap
Parsons	Parsons Engineering
PCs	personal computers
PE	Professional Engineer
PM	Project Manager
QA	Quality Assurance

LIST OF ACRONYMS
(continued)

QC	quality control
RTK	Real Time Kinematic
SEDA	Seneca Army Depot Activity
SOW	Scope of Work
SQCO	Safety and Quality Control Officer
SSHP	Site Safety And Health Plan
SUXOS	Senior UXO Supervisor
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
WESTON$_{SM}$	Weston Solutions, Inc.
WP	Work Plan

SECTION 1

INTRODUCTION

1. INTRODUCTION

This Work Plan (WP) describes the technical approach for performing geophysical mapping of potential ordnance and explosives (OE), unexploded ordnance (UXO), and ordnance related scrap (ORS) as part of a geophysical investigation at the Open Detonation Grounds (ODG) (SEAD 45) of the Seneca Army Depot Activity (SEDA). Weston Solutions, Inc (WESTON$_{SM}$) is performing this work for United States Army Corps of Engineers (USACE) under Contract No. DACA-45-98-D-0004, Task Order No**.** 0037. This WP was prepared in accordance with the *Geophysical Investigation Requirements* found in the USACE's Scope of Work (SOW) dated 25 March 2003, which is included in Appendix A of this WP and *Data Item Description (DID) OE-005-01.01*. The *Site Safety And Health Plan (SSHP)* and *Emergency Response and Contingency Plan (ERCP)* are included in Appendix D of this document and the *Contractor Quality Control Plan (CQCP)* is included in Section 10.

1.1 PROJECT OBJECTIVES

The primary objective of this project is to conduct a geophysical investigation and anomaly identification at the SEAD 45 ODG site. The data will be collected using digital geophysical mapping (DGM) techniques, and this information will be used to develop a database that contains the location and identification of all potential UXO/OE and related debris within the SEAD 45 ODG. This information will also be used to refine acreage estimates for the different remedial zones outlined in the *Engineering Evaluation/Cost Analysis (EE/CA)* submitted by Parsons Engineering (Parsons) in September 2001, and to provide an accurate cost estimate for future full-scale removal actions.

1.2 SITE BACKGROUND AND PLANS FOR FUTURE USE

The SEDA facility was constructed in 1941 and was operated by the United States Army until its closure in July 2000. From 1941 to 1995, the site was used for receipt, storage, maintenance, and supply of military items including munitions and equipment. In 1989, the depot was included on the Federal Facilities National Priorities List, which mandated that necessary remedial

investigations and actions be completed for the site. Following a recommendation from USACE in 1998 that an OE investigation be conducted at the site, Parsons performed an *EE/CA* (Parsons, 2001) to develop response actions for areas of investigation (AOIs) identified.

The SEAD 45 ODG was one of eleven AOIs identified during the *EE/CA* (Parsons, 2001). The SEAD 45 ODG was formerly used for the disposal and detonation of ammunition, and consequently UXO/OE debris are prevalent throughout this area. In accordance with the Base Realignment and Closure process, it is intended that the SEAD 45 ODG be used for future wildlife management/habitat following removal of the UXO/OE debris from this area.

1.3 SITE DESCRIPTION

The SEDA facility is located in Seneca County, Romulus, New York. It is a United States Army facility that occupies approximately 10,600 acres. It is bounded to the west by State Route 96A, and to the east by State Route 96. Geneva and Rochester are located to the northwest (14 and 50 miles, respectively), Syracuse is 50 miles to the northeast, and Ithaca is 31 miles to the south. The surrounding area outside the SEDA property is generally used for agriculture. A site location map is shown in Figure 1-1 of Appendix B.

The SEAD 45 ODG consists of a large open area located in the northwest corner of the SEDA property. It is comprised of approximately 380 acres that will be investigated under this SOW. Approximately 275 acres of non-wooded areas of the ODG will be investigated using a DGM vehicle towed array system. Approximately 20% of the remaining 105 acre wooded areas will be investigated using the vehicle towed array system (where terrain permits), hand towed array, or (if necessary) magnetometers. The SEAD 45 ODG is described in detail in the following subsections. The site plan is show in Figure 1-2 of Appendix B.

1.3.1 Description of Potential UXO/OE and Related Debris

For over 40 years, the ODG were primarily used to destroy ordnance ranging in size from 20-millimeter (mm) projectiles to 155-mm projectiles. A number of 12-inch naval shore battery

rounds and various bomb bodies have also been found. The ODG also takes into its acreage a former grenade range.

Based on information presented in the *EE/CA* (Parsons, 2001), it is anticipated that the primary UXO/OE and related debris that may found during the geophysical investigation could include the following:

20-mm Projectiles	**37-mm Projectiles**	**MK2 Grenades**
57-mm Projectiles	**81-mm Mortars**	**105-mm Projectiles**

Exact quantities of the above-listed items are unknown, but it is likely that the highest concentration of these items occur within the 1,000-foot (ft) inner radius surrounding the ODG center.

For the majority of the ODG, it is anticipated that all potential UXO/OE and related debris will be found at shallow depths of less than 12 inches from the surface. For locations where detonation occurred, debris may be found at a wide variety of depths due to the displacement, movement, and replacement of earth as a result of the detonations and subsequent site maintenance by SEDA personnel.

1.3.2 Digital Topographic Maps

Digital topographic maps of the site are available on compact disc (CD) and have been forwarded to USACE. Currently, WESTON is maintaining an electronic platform in the Geographical Information Systems (GIS)-based *Teamlink* site that includes a digital topographic map. A color map (based on a 3-ft pixel resolution) is shown in Figure 1-2 of Appendix B. Weston Solutions, Inc. has updated the site to include a black and white, 2-ft resolution, panochromatic aerial photo from New York State Department of Environmental Conservation (NYSDEC) in NAD 83 New York Central State Plane Coordinates.

The source scale and contour interval of each map provides different levels of precision and detail, and are generally only as accurate as the published map scale. The map sources currently

available for viewing along with spatial data to be catalogued in the GIS system include the following:

- Aerial photographs.
- United States Geological Survey 7.5-minute topographic quadrangles – 1:24000 scale, contour interval of 20 ft.
- Topographic contours GIS file from Parsons – Source scale unknown, but likely large scale; contour interval of 2 ft. This map only covers the very central extent of the ODG.
- "General Storm Drainage Map" (on paper) from STV/Lyon Associates – 1:4800 scale, contour interval of 5 ft. This map covers the entire ODG. It is currently not in digital format, but will be digitized to allow for overlay with other layers in the GIS system.

Due to differences in horizontal positioning and reference points associated with each map, it is assumed that accuracy in plotting each as an overlay may vary, but will be fit as close as possible to duplicate actual conditions.

1.3.3 Geological Conditions

Stratographic information on the site geology at the ODG was acquired through extrapolating data from the adjacent Open Burning Grounds (OBG) site boring data and cross-sectional profiles that were performed. Although the ODG exists at higher elevations than the OBG site, it is expected that the four distinct geologic units identified at the OBG exist at the ODG as well. These units include artificial fill, till, weathered calcareous shale, and competent calcareous shale.

The geologic overburden glacial till varies in thickness between 5 and 12 ft. The overlying soil at shallower depths has been disturbed as a result of continual grading and/or scraping of the overlying area (i.e., while forming the ODG berms). Grain size analysis of the till reveals a wide distribution of sediment sizes. These tills have a high percentage of silt and clay with trace amounts of fine gravel.

Below the glacial till is an underlying layer of weathered calcareous shale. The weathered shale varies in thickness from 1 to 8 ft and found to be composed of clay with thin pieces of weathered shale present in a primarily clay matrix. A layer of bedrock lies below the weathered shale.

1.3.4 Shallow Groundwater Conditions

The groundwater table is present in the till layer and ranges from a depth of less than 1 ft below ground surface (bgs), to as much as 15 ft bgs. Data indicates that the shallow groundwater is not mineralized. In addition, some locations at the site have wet surface conditions that may be indicative of perched groundwater conditions.

1.3.5 Site Conditions

The site consists of mainly open flat terrain with low gradients of 45 ft over a south-north distance of approximately 5,000 ft, and 30 ft over a west-east distance of approximately 5,000 ft. Reeder Creek, which runs south to north through the site, exists at an elevation of approximately 600 ft. It is a seasonal creek with an average velocity of approximately 1 to 3 ft per second. The banks to the creek are generally 12 to 15 ft high, and typically steep. The highest elevation within the 2,500-ft radius is located south of the ODG mounds at an elevation of approximately 643 ft.

1.3.6 Manmade Features

The ODG contains few manmade features that might affect the geophysical investigation. At the center of the ODG proper is a series of earthen berms that formerly contained the open detonations. These berms are not part of the DGM investigation and should not interfere with geophysical investigation and mapping activities. Additionally, there are site access roads located as shown in Figure 1-2 of Appendix B; however, these also are not anticipated to impede site activities. Metal fencing encountered within the site will be removed prior to starting the DGM investigation. Other structures/features include: drainage structures; telephone poles; concrete bunkers; a metal storage shed; and an office building. These structures will be mapped prior to initiating the full-scale DGM effort.

1.3.7 Site Specific Dynamic Events

Weather

The SEDA site is located in a region that is susceptible to inclement weather including: heavy precipitation; electrical storms; hurricanes; and extreme temperatures. In the event of adverse weather conditions, field personnel will be instructed to modify site operations as follows:

- Stop work
- Secure all loose materials, toolboxes, plywood, trashcans, etc.
- Retreat to safe areas or indoors when severe weather is in the immediate area.

Detonations

Although intrusive activities will be limited to those performed to establish survey control points and to re-acquire target anomalies as part of the quality control (QC) requirements, UXO/OE may be encountered either insitu or on the ground surface during the project that are required to be blown in place (BIP). In the event a UXO or OE item is found on the ground surface and determined unsafe to transport, it will be BIP. All suspect UXO or OE items will need to be verified prior to removing or detonating them.

Any intrusive investigations to be performed at a distance less than 1,233 ft from the SEDA property line, inhabited buildings, or public traffic routes will require use of a Miniature Open Front Barricade system in accordance with the September 2003 *Explosives Safety Submission*. When the distance is less than 200 ft, traffic will be stopped and buildings will be vacated until the intrusive work has been completed. These locations will be identified by WESTON and confirmed with USACE. All detonations will require work to stop until the BIP item is confirmed.

1.3.8 Potential Worker Hazards

Potential safety hazards, and methods of avoidance and mitigation are detailed in the *SSHP* included in Appendix D. A UXO Safety and Quality Control Officer (SQCO) will be present on-site throughout the DGM survey and related activities to implement the requirements of the *SSHP*. The SQCO will be responsible for ensuring worker safety, and will also be responsible for documenting and reporting any health and/or safety infractions to the Regional Safety Officer. All field employees will be required to hold current 40-hour Hazardous Waste Operations training.

1.4 WORK PLAN ORGANIZATION

This WP was prepared following the format, content, and preparation instructions specified in the *USACE DID OE-005-01-01* for a *Type I1 Work Plan* (U.S. Army Engineering and Support Center, Huntsville, Alabama; revised 1 October 2002). Sections referenced in the DID that are not applicable to this SOW have been omitted from the WP, but left in the table of contents for reference and formatting purposes as per DID. Chapters are organized as follows:

- Chapter 1 Introduction
- Chapter 2 Technical Management Plan
- Chapter 3 Explosive Management Plan
- Chapter 4 Explosives Siting Plan
- Chapter 5 Geophysical Prove-Out Plan and Report
- Chapter 6 Geophysical Investigation Plan
- Chapter 7 Location Surveys and Mapping Plan
- Chapter 8 Work, Data, and Cost Management Plan
- Chapter 9 Property Management Plan
- Chapter 10 Contractor Quality Control Plan
- Chapter 11 Environmental Protection Plan
- Chapter 12 Investigative Derived Waste Plan
- Chapter 13 Geographical Information Systems Plan
- Chapter 14 Interim Holding Facility Siting Plan for RCWM Projects
- Chapter 15 Physical Security Plan for RCWM Projects Site
- Chapter 16 References

- Appendices

  - Appendix A—Task Order Scope of Work
  - Appendix B—Site Plans, Schedules, and Charts
  - Appendix C—Local Points of Contact
  - Appendix D—Site Safety and Health Plan
  - Appendix E—Contractor Forms
  - Appendix F—Resumes
  - Appendix G—Geophysical Prove-Out Work Plan
  - Appendix H – GPO Letter Report

SECTION 2

TECHNICAL MANAGEMENT PLAN

2. TECHNICAL MANAGEMENT PLAN

The Technical Management Plan was prepared to document the approach and procedures to be used to execute the tasks required under this Task Order.

2.1 APPLICABLE GUIDANCE AND REGULATIONS

All surveying, UXO avoidance support, vegetative clearing, and geophysical activities will be performed in accordance with all local, state, and federal regulations and will include all applicable USACE SOW and DID requirements.

All activities involving work in areas potentially containing UXO hazards shall be conducted in full compliance with OE MCX, Department of the Army, and Department of Defense requirements regarding personnel, equipment, and procedures. Permitting is not required; however, all explosives will be handled in accordance with the State of New York's Industrial *Code Rule 39, Possession, Handling, Storage, and Transportation of Explosives* and the *Bureau of Alcohol, Tobacco, and Firearms Regulation*. All persons engaged in the handling and transportation of explosives will be in compliance with *Title 18 U.S.C. 842* and *29 CFR 1910.120*.

2.2 TECHNICAL SCOPE

Geophysical mapping will be performed within the 380-acre footprint to collect investigative target data to delineate the area representing the footprint limits of all UXO/OE within the ODG. This information and the associated target item dig lists will be used as the basis for preparing a cost estimate for full-scale removal actions to be performed at a later date. Activities that will be required to support this objective include a UXO avoidance inspection, tree clearing, and surveying.

A baseline grid system has been established using the existing northing NAD 83 New York Central State Plane Coordinates. In order to track and document geophysical mapping progress, a 125 ft by 125 ft grid system has been established within the 5,000-ft circular footprint of the

ODG site. The grids are numbered 1-44 running south to north, and lettered A-RR running west to east. It is anticipated that geophysical equipment will be able to map data using 10-ft lane widths (based on three Electromagnetic (*EM)-61*'s with a coverage area of 3.5 ft each).

The equipment utilized during the Geophysical Prove-Out (GPO) consisted of a towed array system with three EM-61's. This subject is covered in more detail in the *Geophysical Investigation Plan* (Chapter 6). Terrain limitations that have been identified include: ponded areas, highly rutted areas, wetland areas, or areas where the tree growth is too dense to map without complete clearing. Slopes along Reeder Creek will also prove difficult to map. A copy of the Parsons GPO Work Plan is included in Appendix G, and the GPO Letter Report is included in Appendix H.

2.3 CHANGED SITE CONDITIONS

Weston Solutions, Inc. will keep USACE updated constantly via daily reporting and communications of on-site conditions. In the event extreme adverse weather conditions exist or a change in site conditions is identified, WESTON will notify USACE immediately.

The potential for changed site conditions (besides weather) is highly unlikely since the area will be inspected for UXO/OE and cleared of vegetation in advance of the geophysical mapping activities. The greatest obstacles likely to impede mapping progress include stump debris from site clearing activities, terrain conditions, and/or standing water.

2.4 VENTING AND DISPOSING OF OE AND ORS

Management, reporting, venting, and disposal procedures for UXO, OE, and ORS are detailed in the *Explosives Management Plan* (Chapter 3).

2.5 PUBLIC AFFAIRS AND COMMUNITY RELATIONS

All public affairs and community relation issues will be handled by USACE. It is not anticipated that any public officials or local representatives will be on-site, since unauthorized personnel will not be allowed inside the SEDA gate unless approved by WESTON or USACE personnel. In the

event that a visitor requests information, WESTON will defer the individual to USACE and SEDA located at Post Gate No. 1.

Weekly Status Reports will be submitted to USACE (Omaha), USACE (New York District at Seneca Area Office), and SEDA on the Tuesday following the prior reporting period during sitework. Monthly Reports will be submitted to USACE, SEDA, NYSDEC, and U.S. Environmental Protection Agency by the first business day of each month for the prior reporting period in accordance with the Federal Facilities Agreement.

It is anticipated that weekly meetings or conference calls (at a minimum) will be held between USACE and WESTON at the site. Topics to be discussed will include but not be limited to safety, project costs, schedule, progress, technical issues, other miscellaneous issues and lessons learned.

2.6 PROJECT ORGANIZATION

Mr. Christopher Henry (Program Operations Manager), and Mr. Christopher Kane [Project Manager (PM)], will provide overall management of the Time Sensitive Geophysical Investigation. They will be responsible for WESTON's performance from project inception to completion. All sitework activities will be coordinated through the following USACE representatives:

- Mr. Thomas Westenburg (USACE Rapid Response Design Manager)
- Mr. Randy Battaglia (USACE Project Manager)
- Mr. Thomas Battaglia [USACE Contracting Officers Representative (COR)]
- Mr. Steve Absolom (SEDA Base Environmental Contractor)
- Mr. Andrew Schwartz (USACE Geophysicist)

Contact information for the above-listed USACE personnel is included in Appendix C. The WESTON PM will interact directly with the USACE PM and COR. All sitework activities will be coordinated through communications between WESTON's Site Manager/Geophysicist and the USACE COR and Geophysicist.

The following subsections contain details pertaining to project schedule, submittal requirements, and personnel. A project organization chart for WESTON employees is shown in Figure 2-2 in Appendix B, and a detailed description of WESTON personnel and subcontractors is provided in Subsection 2.6.3.

2.6.1 Project Schedule

Weston Solutions, Inc. personnel mobilized to the site on 14 April 2003 to begin site preparation. To date, site preparation has included assisting USACE in setting up the GPO and establishing the 1,000 ft and 2,500 ft radial limits. Additional site preparation activities will include surveying existing benchmarks and establishing up to five new benchmark monuments, and performing a site inspection by qualified UXO Technicians to remove surface UXO/OE and ORS. It is anticipated that WESTON's brush-clearing subcontractor, and geophysical mapping subcontractor will mobilize to the site within two weeks following the start of the UXO inspection. The brush-clearing subcontractor will start brush-clearing operations at that time with a scheduled duration of approximately 24 days. The geophysical mapping subcontractor conducted GPO operations between 23 and 25 April 2003. It is anticipated that full scale geophysical mapping will begin the week of 2 June 2003. The full-scale DGM is scheduled for completion by 28 July 2003. The Project Schedule, which will be adjusted as necessary throughout the project duration, is presented in Figure 2-1 of Appendix B. Any changes to the schedule that affect data or cost will be reported to USACE.

2.6.2 Submittals

Weston Solutions, Inc. will submit the following documentation to USACE as required throughout the project duration:

Submittal	Directive	Frequency
Survey Mapping Plan	OE-005-07.01	Prior to survey
Resumes of Key Personnel	OE-025.01	Prior to start and prior to replacement of personnel

GPO Work Plan	OE-005-05A.01	Prior to GPO
GPO Letter Report	OE-005-05A.01	3 days following GPO
Project Work Plan, including: ▪ Geophysical Investigation Plan (OE-005-05.01) ▪ Quality Control Plan (OE-005-11.01) ▪ Site Safety and Health Plan (OE-005-06.01) ▪ Environmental Protection Plan (OE-005-12.01)	OE-005-01.01	Prior to project start
Daily Reports		9:00 A.M. each work day
Monthly Status Report	OE-080.01	Within 1 calendar day following the reporting cut-off date
Weekly Status Report	OE-085.01	By close of business the Tuesday following the week being reported on.
Confirmation Notices including: ▪ Records of discussions ▪ Verbal directions ▪ Telephone conversations	OE-055.01	In weekly status report
Equipment QC Checks, Inspection Checklists, and Calibration Logs		Hard copy, daily
Meeting Minutes	OE-045.01	Within 7 days of the meeting
Preliminary Data	OE-005-05.01	Within 24-hr of collection
Confirmed Data	OE-005-05.01	Within 5 days of collection
GIS based data (including, Dig sheets and DGM data)	OE-005-14.01	5 days following completion of dataset
Draft Project Report	OE-030.01	Within 6 weeks of project completion
Final Project Report	OE-030.01	Within 21 days of receiving comments from USACE on the Draft Project Report

2.6.3 Personnel

Personnel involved with the geophysical investigation will include the following WESTON employees: PM, Site Manager/QC Geophysicist; Project Engineer, UXO SQCO; and Survey Technician,. The PM and Project Engineer will provide support both on-site and off-site throughout the project duration; all other employees will provide full-time field support. At a minimum, the following WESTON subcontractors will provide additional field support: Project Geophysicist; Site Geophysicist; Geophysical Technicians; UXO Technicians; Surveyors; and Site Clearing Crews. The project organization chart is shown in Figure 2-2 of Appendix B.

All personnel will be required to comply with the medical, training, experience, and educational requirements specified in *USACE DID OE-025.01, Section 29 Code of Federal Regulations 1910.120*, and WESTON's *SSHP* (Appendix D).

Project Manager

The PM will have a degree in engineering and shall have a minimum of five years of project management experience. The PM will have overall responsibility for the management and completion of the project, which includes at a minimum: resource allocation; financial reporting; schedule control; review and approval of deliverables; invoice review and approval; and overall management of the project.

Project Engineer

The Project Engineer will have a degree in engineering and a minimum of two years experience in the construction/environmental field. The Project Engineer will be responsible for ensuring field activities meet the technical objectives of the project, through estimating, scheduling, quantity tracking, daily reporting, and deliverable preparation and submittal, technical reviews, and daily communications with the client.

Site Manager/Quality Control Geophysicist

The Site Manager/QC Geophysicist shall have a degree in geophysics, or a closely related field, and shall have a minimum of five years of directly related geophysical experience. This individual will be responsible for coordinating and supervising all site activities, which include but are not limited to supervision of WESTON subcontractor personnel, and submission of daily reports, QC data, and subcontractor reports. The Site Manager/QC Geophysicist will utilize the following measures to provide overall QC of all geophysical investigation work efforts:

- Evaluate the subcontractor's field procedures through functionality checks, QC tests of DGM procedures, additional GPO activities, etc.
- Evaluate the subcontractor's raw field data for the following (at a minimum):
    1. Navigational precision
    2. Data density and completeness
    3. Peak response from MK 2 data with respect to seeded items
    4. QC data relative to acceptance criteria
    5. Signal/Noise effects
- Perform complete processing/analyses/and anomaly identification on selected data sets.
- Provide detailed input to daily reports on the progress.
- Identify and report QC failures, deficiencies and deviations from approved procedures, and seek rapid resolution.
- Manage files and interface with GIS Analyst to develop plots, and track and manage data collection, Quality Assurance (QA), and processing status.

UXO Safety/Quality Control Officer

The UXO SQCO (WESTON) shall be on-site at all times during UXO/OE-related work. The UXO SQCO shall have a minimum of ten years of UXO/OE experience including UXO/OE clearance operations and supervising personnel.

This individual must be able to fully perform all functions associated with UXO Sweep Personnel and UXO Technicians II and III including:

- The ability to implement the approved UXO/OE safety program in compliance with all federal, state, and local regulations.
- Analyze UXO/OE and explosives operational risks, hazards, and safety requirements.
- Enforce personnel limits and safety exclusion zones for UXO/OE clearance operations.
- Unexploded ordnance and explosives transportation, storage, and destruction.
- Conduct safety inspections to ensure compliance with UXO/OE safety codes.
- Operate and maintain air-monitoring equipment if required.
- Implement QC requirements including QC inspections of all UXO/OE-related work.
- Direct and approve corrective actions to ensure that UXO/OE-related work complies with contractual requirements.

Survey Technician

The survey technician will have five years experience in the construction/environmental field and will be familiar with line and grade control. This individual will be specifically trained on use of the Trimble-Real Time Kinematic (RTK) unit, which is the Global Positioning System (GPS) instrument designated for this project. The Survey Technician will be responsible for ensuring that all work zones are delineated in the field, that line and grade controls are established and maintained, and vegetation clearing and geophysical mapping progress is accurately tracked. The Survey Technician will also provide support as needed for establishing and maintaining erosion controls on-site.

Project Geophysicist

The Project Geophysicist (WESTON Subcontractor) shall have a degree in geophysics, geology, geological engineering, or a closely related field, and shall have a minimum of ten years of directly related geophysical experience. This individual will have overall responsibility for

design, implementation, and management of the technical execution and quality of the geophysical mapping effort.

Site Geophysicist

The Site Geophysicist (WESTON Subcontractor) shall have the same education requirements as the Project Geophysicist; however, ten years of direct experience is not required provided he/she is working under the general supervision of a Project Geophysicist. This individual will be responsible for managing the efforts of the geophysical mapping teams on-site, coordinating fieldwork with WESTON's Site Manager, report preparation, and oversight of data collection and analysis. The Site Geophysicist may also perform the Project Geophysicist role if he/she meets the criteria presented above.

Geophysical Technicians

The Geophysical Technicians (WESTON Subcontractor) will be responsible for collecting geophysical data in the field. This includes setting up, operating and maintaining the geophysical instruments, recording the geophysical data and notes, and having the necessary computer skills to deliver collected information to the Site Geophysicist.

UXO Technicians

The UXO Technicians (WESTON Subcontractor) will conduct a UXO avoidance inspection prior to the geophysical investigation to remove any surface debris that may interfere with the DGM effort. Following the surface inspection, UXO Technicians will provide oversight during the brush clearing, and will accompany geophysical personnel as needed to prevent accidental exposure to potential hazardous ordnance items. The UXO Technicians will meet the qualifications of a UXO Technician II at a minimum, or be under the direct supervision of a UXO Technician III.

Survey Personnel

If required, survey personnel (WESTON and/or WESTON subcontractors) will aid in establishing benchmarks for siting the GPS equipment, and will support any target anomaly reacquisition.

2.7 MOBILIZATION AND SITE PREPARATION

2.7.1 Utilities

It is anticipated that major site utilities are neither present, nor transiting SEAD 45; however, it is likely that drainage utilities exist within the vicinity of the site. Prior to beginning the geophysical survey, the field teams will note of any utilities within the vicinity of the site. Utilities located below the surface should not be an issue since no intrusive activities are scheduled; however, underground ferrous utilities may interfere with the DGM, and will be noted as applicable.

2.7.2 Site Accessibility and Traffic Control

The site is generally accessible by two and four-wheel drive vehicles via access roads located around the perimeter of the ODG. Additional access is available by firebreak roads located throughout the site as shown in Figure 1-2 of Appendix B. After periods of heavy rain, the quality of these roads may degrade, and only four-wheel drive vehicles are recommended for gaining site access.

2.7.3 Site Security

Both routine and emergency response actions dictate the need for prevention of unauthorized site access, and for the protection of vital records and equipment. The site access gate and office building will remain locked when not in use. All WESTON and USACE personnel will have keys to these areas. No visitors will be permitted on-site without approval from WESTON and

USACE. All visitors will be expected to sign in at Post Gate No. 2, and will be escorted by WESTON while on-site.

All WESTON-owned and government-owned equipment will be stored in locked containers.

2.7.4 Brush Clearing

Prior to conducting the geophysical investigation work, brush-clearing activities will be performed so that the geophysical mapping instruments can be towed or pulled over the ODG site with minimal interference. As referenced in Subsection 1.3, a total of 380 acres may be investigated under this SOW (i.e., the area between the 1,000-ft and 2,500-ft radius). Based on a visual inspection of the site, approximately 275 out of the 380 acres consist of non-wooded vegetation while the remaining 105 acres (approximately 30%) consist of wooded vegetation. The distribution of non-wooded and wooded vegetation is shown in Figure 2-3 of Appendix B. The wooded areas are shaded in "yellow". The areas noted in yellow are shown as approximate locations only, where tree cover is denser and may require hand or manual clearing of debris. Typical species found within these areas may include: White Elm, Red Maple, White Oak, White Ash, Bitter-nut Hickory, Black Walnut, Red Cedar, and several species of Pine. Weston Solutions, Inc. does not anticipate any clearing to be performed within the 1,000-ft radius; however, this will be verified in the field.

Non-wooded vegetation will be cleared to a height of approximately 4 to 6 inches, and all debris will be moved to a staging area specified by USACE (where necessary). Currently, locations north, south, east, and west of the 2,500-ft radial limit have been identified and will be delineated in the field. Vegetation greater than 6 inches in diameter will remain in place. Wooded vegetation will only be cleared with the direction of WESTON or USACE. As with non-wooded material, the vegetation removed from the wooded areas will be cut to approximately 4 to 6 inches and removed (with exception to trees greater than 6 inches in diameter). As many trees as possible will be preserved while still allowing access for the geophysical field team. It is projected that USACE may approve a maximum of 20% of the wooded areas to be cleared (approximately 21 acres). Remaining vegetation that may interfere with the geophysical

equipment will be trimmed to the extent possible such that limbs, branches, and leaves exist at a height greater than 6 ft above the ground surface.

Based on the time of year that sitework is scheduled to begin (Spring/Summer 2003), it is projected that the ground surfaces requiring clearing will be saturated and soft; therefore, appropriate equipment will be required to access these areas. Clearing activities will be accomplished utilizing a Hydra-Ax machine and other heavy duty mowing equipment. Due to the extent of the clearing area and schedule requirements for productivity, the clearing subcontractor may have up to five operators and eight laborers on-site at any one time. Clearing will be initiated on the west side of the site proceeding east. Areas to be cleared will be delineated by WESTON prior to clearing. Confirmation will be performed using a Trimble-RTK GPS unit.

SECTION 3

EXPLOSIVES MANAGEMENT PLAN

3. EXPLOSIVES MANAGEMENT PLAN

3.1 GENERAL

This Explosives Management Plan outlines the procedures to be used by WESTON personnel to acquire, receipt, store, transport, issue, and report the loss of explosives utilized during the geophysical mapping of SEAD 45.

All personnel involved with explosives will comply with all federal, state, and local laws as required.

3.2 LICENSES /PERMITS

Weston Solutions, Inc. has a Type 33-User of High Explosives Permit from the Department of the Treasury – Bureau of Alcohol, Tobacco, and Firearms for the purchase of explosives to be used during the geophysical mapping of the ODG.

3.3 ACQUISITION

The types and estimated quantities of explosives that are anticipated are listed in Table 3-1:

Table 3-1

Explosive Quantities

Item	Quantity
Boosters, Cast	120 each
Shaped Charges	50 each
Time Fuse	500 ft
Non-electric	100 each
Detonating Cord	500 ft
Fuse Igniters	100 each

Explosives will be purchased from a commercial vendor. Vendor information will be provided as required.

3.4 INITIAL RECIEPT

The following procedures will be adhered to upon receipt of explosive materials.

a. Upon arrival at Post Gate No. 2 by the commercial vendor, the vendor will be brought inside the fenced in area.

b. The gates will be locked to prevent unauthorized access to the explosives by outside sources.

c. The vehicle transporting the explosives will be escorted to the explosives bunker prior to unloading.

d. All unauthorized personnel will remain at a minimum of 900 ft from explosive vehicle while it is loading/unloading.

e. An individual authorized to receive the explosives will compare the explosives delivery record to the actual quantity delivered prior to accepting custody for the explosives.

f. Once the quantity has been confirmed the explosive delivery record will be signed and the explosives stored in the approved bunker.

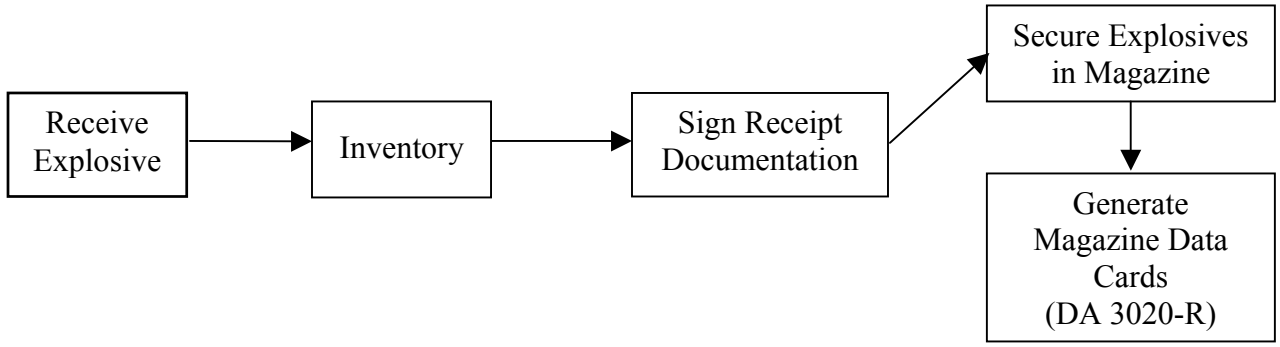
g. If it is determined that there is a discrepancy between the quantity delivered and quantity shipped the following will occur:

- Notify the Site UXO Safety Officer.
- Do not accept shipment.
- Contact the Shipper to resolve the discrepancy.

Note: If discrepancy cannot be resolved, notify the Local Law Enforcement Agency, Bureau of Alcohol, Tobacco, and Firearms, WESTON Regional Safety Manager, PM, and the USACE COR.

Figure 3-1

Procedures for Receipt of Explosives



3.5 STORAGE

Explosive materials will be stored as follows:

a. Explosives will be stored in earthen igloos provided by SEDA. These explosive igloos comply with Department of the Army, Department of Defense Explosive Safety Board, Bureau of Alcohol, Tobacco, and Firearms, and the State of New York regulations pertaining to explosive magazines.

b. The explosive magazine will be secured with a padlock having a case hardened shackle and at least five (5) tumblers and shall be protected with a cap constructed of at least No. 14 gage steel so as to prevent sawing or levering action on the lock or hasp.

c. In the event that the lock or facility shows signs or tampering or break-in, do not enter the magazine or touch the broken lock/door. Refer to Subsection 3.11 Loss, Theft, and Unauthorized Use of Explosives.

3.6 TRANSPORTATION

The transportation of explosives from the magazine to locations requiring demolition operations will be conducted in the following manner:

a. Vehicles transporting explosives from the magazine to locations requiring demolition operations will stay on all roads either improved or unimproved.

b. Speeds will be kept to 20 miles per hour (mph) or less depending on road conditions.

c. Radio communications will be maintained with the UXO Safety Officer.

d. Vehicles will have a safety inspection performed prior to loading explosives.

e. Vehicle will be equipped with a first aid kit and a minimum of two (2) each 2A10BC fire extinguishers.

f. Vehicle will be placarded during transport of explosives.

g. The driver of an explosive laden vehicle will have in his possession a commercial drivers license with "H" endorsement.

h. When transporting off Seneca Army Depot additional requirements are:

- New York State Explosives License
- Initial Response Information
- Shipping Papers

3.7 RECIEPT PROCEDURES

Prior to accepting any explosives, the procedures outlined above in the initial receipt procedures will be accomplished.

The WESTON UXO QC/Safety Officer (Mr. Frank Henderson) is authorized to receive, issue, transport, and use explosives at the SEDA, Romulus, New York.

Upon completion of each demolition operation, an ammunition consumption report will be completed. Upon expenditure of all explosives, the authorized person will certify in writing that the explosives were used for their intended purpose.

3.8 INVENTORY REQUIREMENTS

A physical inventory of all explosives will be accomplished in accordance with the following schedule:

- Whenever explosives are removed from the magazine for demolitions operations.
- Or a minimum weekly basis, when the magazine is not unlocked and opened.
- Whenever the door to the magazine is unlocked.

Exception: When opened for inspection by State or Federal Inspectors, an inventory need not be completed.

A running inventory will be completed using the Department of Army Form 3020-R Magazine Data Card. If a discrepancy exists between the physical inventory and inventory records, the following steps will be taken:

- Notify the UXO Safety/QC Officer
- Re-inventory explosives
- Inspect data cards for errors
- Reconcile data cards, physical inventory, and ammunition consumption reports

Note: If discrepancies continue to exist, see Subsection 3.11 Loss, Theft, and Unauthorized Use of Explosives.

3.9 RETURN OF UNUSED EXPLOSIVES

All explosives not used for demolitions operations will be returned to the magazine at the end of the day. Magazine data cards will be annotated and an inventory completed in accordance with inventory requirements above.

3.10 DISPOSAL OF REMAINING EXPLOSIVES

Upon completion of all site activities, USACE will be contacted with a request to dispose of all excess explosives. Upon approval from USACE, all explosives will be disposed of in accordance with appropriate demolition procedures and within current range limits of five pounds per shot.

3.11 LOSS, THEFT, AND UNAUTHORIZED USE OF EXPLOSIVES

These procedures apply if either of the following occurs:

- If during an inspection of the explosive magazine, it is determined that forced-entry has occurred:

  a. Do not enter the magazine.

  b. Do not handle or disturb items within the immediate vicinity.

c. Secure the magazine by posting a guard to prevent further access.

d. Notify the following individuals:

i. WESTON UXO Safety (Mr. Frank Henderson)
ii. WESTON Project Manager (Mr. Christopher Kane)
iii. WESTON Regional Safety Manager (Mr. Ted Blackburn)
iv. SEDA Post Commander (Mr. Steve Absolom)
v. USACE Contracting Officer
vi. USACE Contracting Officer Representative (Mr. Tom Battaglia)
vii. USACE Safety Specialist (Mr. Frank Magner)
viii. Seneca County Sheriff's Department
ix. Bureau of Alcohol, Tobacco, and Firearms
x. WESTON Director UXO Services (Mr. Charles Heaton)

e. Do not allow entry into the magazine by others until Law Enforcement Personnel arrive.

f. Immediately upon request of Law Enforcement personnel perform physical inventory and reconcile on-hand explosives with magazine data cards.

g. Assist above individuals and agencies as needed.

- If during routine inventories, discrepancies are discovered and cannot be reconciled, notify the personnel listed above.

SECTION 4

EXPLOSIVES SITING PLAN

4. EXPLOSIVES SITING PLAN

Not applicable to this Task Order.

SECTION 5

GEOPHYSICAL PROVE-OUT PLAN AND REPORT

5. GEOPHYSICAL PROVE-OUT PLAN AND REPORT

5.1 GEOPHYSICAL PROVE-OUT SURVEYS

The *GPO work plan* has been prepared by Parsons and is included in Appendix G of this document.

The potential methods and instrumentation to be utilized during the full-scale investigation of the ODG will be demonstrated during the GPO. Data collected during the GPO will be used to produce an anomaly Target Dig List that will be used to provide an accurate estimate for the cost of performing the full-scale DGM investigation, and subsequent removal action. The GPO will be conducted by Parsons in accordance with the following *USACE DIDs*: *OE-005-05A.01* and *OE-005-05.01*.

5.1.1 Grid Lay Out

Vegetation within the proposed test grids will be cleared from the GPO test area by SEDA, and known UXO/OE or equivalent items will be seeded as described in Subsection 5.1.2.

The GPO grids will be established by USACE and will not exceed one acre in size. These grids will be separated by a minimum of 300 ft, to a maximum of 4,000 ft. The GPO grids will be located on the outermost boundary of the SEAD 45 ODG site, near the entrance road.

The grids will be located adjacent to tree growth to further test the positioning capabilities of the geophysical sensor suite. Due to the distance from the center of the ODG, it is anticipated that this location will provide a test area that contains minimal UXO/OE and related debris.

5.1.2 Seed Items and Background Mapping

U.S. Army Corps of Engineers and WESTON will use a selection of inert ordnance items, ordnance debris recovered from previous clearing activities at the SEDA OBG, and steel stock of appropriate size to simulate ordnance items to provide a representative sampling of the potential ordnance items that may be detected during the DGM evaluation. For seeding purposes,

approximately 25 complete inert ordnance items and approximately 75 pieces of inert ordnance debris will be buried within the GPO grids. The size of chosen items will be representative of the potential items to be found throughout SEAD 45. Fragment pieces will represent items ranging in size from approximately 10% to 75% of a complete ordnance item. These items have been catalogued and precisely located, so that accurate data correlations can be made to the data collected during the GPO.

5.2 EVALUATION

Upon completion of the GPO, Parsons will submit the following documentation:

- Letter report
- Anomaly Plots and Target Dig List
- Raw data
- Final processed data
- Cost proposal for full scale investigation

The above-listed deliverables will be reviewed by WESTON, and based on the results documented; the DGM techniques demonstrated during the GPO will be approved by USACE for the full-scale mapping effort of the ODG.

Any changes to cost or schedule will be reported to USACE and negotiated prior to issuance of the full-scale geophysical investigation contract.

SECTION 6

GEOPHYSICAL INVESTIGATION PLAN

6. GEOPHYSICAL INVESTIGATION PLAN

The primary objective of this project is to conduct a geophysical investigation and anomaly identification at the SEAD 45 ODG site. Based on project planning discussions between USACE and WESTON, a towed-array EM-61 MK2 or equivalent system has been selected as the most appropriate technology to perform full scale DGM at the ODG site.

6.1 GEOPHYSICAL INVESTIGATION

The specific areas to be investigated under the SOW are divided into an inner radius and an outer radius as shown in Figure 1-2 of Appendix B. Based on data documented in the *EE/CA* (Parsons, 2001), the inner radius has an estimated radius between 800 and 1,200 ft from the ODG center. The inner radius is considered to be saturated with potential anomalies associated with UXO, OE and ORS, and is assumed to have a very high response level, which would render DGM ineffective for identifying anomaly items. This area will be most effectively investigated using mechanical removal and segregation methods. For estimating purposes, USACE has agreed to target the inside radial limit of 1,000 ft to define the perimeter extent of the saturated zone. However, the actual radial limits will be confirmed in the field.

The *EE/CA* (Parsons, 2001) reported the furthest distance that UXO/OE was identified from the ODG proper at 2,150 ft; therefore, a maximum radius of approximately 2,500 ft, as shown in Figure 1-2 of Appendix B, has been selected for purposes of the DGM investigation. It is assumed that UXO/OE and ORS are not present beyond the 2,500-ft radius. Areas within the outer radial limit that are accessible to the towed-array system will be digitally mapped using this method. Along hedgerows, and in wooded areas, 20% of the area, i.e., 10-ft. lane widths spaced every 50 ft. (+ or -) will be mapped. In heavily forested/vegetated sections of the ODG geophysical mapping will be performed using the vehicle towed array (space permitting), hand-towed array, or via "mag and flag" technique.

The radial distance of the inner and outer rings will be refined as part of this geophysical investigation. Since the locations of the inner and outer limits are based on the distance from the ODG center, the coordinates for the center of the ODG proper were interpreted based on

information presented in the *EE/CA* (Parsons, 2001) and through review of subsequent aerial photos of the site.

The following sections describe the methods and procedures for the GPO and full-scale geophysical investigation.

6.1.1 Survey Type

The geophysical survey being conducted at the ODG is a full coverage survey in non-wooded areas. All other Wooded areas will be mapped at a frequency of approximately 20%. Fieldwork will include the GPO, followed by full-scale DGM of the ODG. The GPO, which is summarized in Subsection 5 and presented in detail in Appendix G, will require using a towed-array system to geophysically map three non-contiguous prove-out grids. The prove-out grids will be established by USACE and will not exceed one acre in size. Following completion of the GPO, a full-scale DGM investigation of SEAD 45 will be conducted using the mapping techniques demonstrated during the GPO.

6.1.2 Equipment and Instrumentation

Survey Platforms

The digital mapping system that will be tested at the GPO areas will include a towed-array comprised of multiple *Geonics* EM61-MK2 sensors, interfaced with GPS. The EM-61 MK2 is a 4-channel high sensitivity metal detector consisting of a powerful transmitter that generates a pulsed EM field that induces eddy currents in nearby metallic targets. Two receiver coils mounted on the coil assembly measure the decay times of these currents. The coils of the standard instrument are 1 meter (m) by ½ m. The use of multiple MK2 sensors enables the operator of the towed array system to collect data in wider transect swaths. This increases data collection rates and decreases overall time and effort. A towed array of three EM61-MK2 coils will be used to perform both the GPO and full-scale DGM at the ODG.

Navigation and Mapping System

Navigation for the digital mapping will be provided using a Trimble Model 4700 RTK GPS unit. The GPS unit will be interfaced with the EM-61 MK2. Geometrics *Maglog*™ software will be used to stream the raw data into a field laptop PC. The logging software will attach a common time stamp to both the Trimble data and the MK2 data using the PC clock. This will eliminate the need to merge independently time stamped data sets during the pre-processing stage.

The Data Quality Objective (DQO) defines horizontal accuracy of the system. For the ODG survey horizontal accuracy will be equivalent to the "sum of differences" that are inherent to the system as discussed in Subsection 6.6.2. Navigational data will be presented in New York Central State Plane Coordinates in U.S. Survey Feet units.

Data Processing System

The raw field data will be imported into Geometrics *Magmapper*™ for pre-processing. For the full scale mapping effort, the subcontractor will post-process the field data using *Geosoft Oasis montage*™ software. Weston Solutions, Inc. will also utilize *Geosoft Oasis montage*™ software to perform the review and QC checks on the subcontractors' data. A detailed summary of the subcontractors' data processing methods and WESTONs analyses and QC is provided in subsection 6.4.

Sampling Frequency

For the GPO and full scale mapping surveys, the subcontractor will program the sampling frequency at no less than 1 hertz (Hz) for the navigation data stream and 10-12 Hz for the EM-61 MK2.

6.1.3 Production Rates

Based upon past experience, and assuming there are no delays to the project schedule caused by

weather or other unexpected factors, WESTON anticipates collecting data at the ODG utilizing the following methods:

- **Vehicle Towed-Array of multiple (i.e., three) EM-61/MK-2 coils** - Given the technical complexities at the ODG, WESTON anticipates collecting six acres of data per day with this type of system. This rate may vary based on conditions encountered in the field. In ideal conditions (flat grassy open terrain) production rates could exceed the six acres per day productivity rate. Conversely, in areas of soft, rutted, wet, or stripped vegetation(< 6 inches in diameter and < 6 inches in height), productivity rates could decrease to less than six acres per day.

- **Traditional auto mode using a single EM 61/MK-2 coil –** Wooded areas within the outer radial limit that are not accessible to the towed-array detection system will be digitally mapped using a single hand-towed EM 61 MK2. Along hedgerows, and in wooded areas, 20% of the area (10 ft. lane widths spaced every 50 ft.) will be mapped using this approach. Data will be acquired using a Cartesian coordinate grid system that will be geo-referenced to no less than two, surveyed control points. The control points will be assigned an X, Y value (measured off the Cartesian grid) to allow the analyst to "warp" (project) the data into State Plane coordinates. Data collection will be reduced in wooded areas and where manmade structures exist. In these areas, mapping may be reduced to one acre per day, per team.

- **MAG and Flag -** Areas possessing very dense tree growth (prohibiting the use of the hand-towed EM-61 MK2) may be mapped manually (to the extent possible) using "mag and flag" methods.

6.1.4 Survey Mission Plan Map

The Survey Mission Plan Map will be included in the *Final WP* in Appendix B.

6.1.5 Location Surveying

A Registered Land Surveyor and Professional Engineer (PE) will identify or establish up to 5 (five) control monuments. The control points will be used to confirm X and Y positioning prior to collecting any GPS generated data. This is necessary due to the high level of accuracy that is required. A PE will not be required for interim survey data since GPS will be used off of the control points established by the registered Land Surveyor and PE. Control cards will be generated for the control monuments that are established within the ODG and furnished to USACE and SEDA.

A grid system will be established across the entire site within the 2,500-ft radius. The grid pattern will utilize a 125-ft by 125-ft grid system. Stakes will be established every 500-ft by 500-ft. The number, location, and spacing of these grids will be established prior to the full-scale DGM evaluation. However, WESTON plans to minimize setting stakes as this may interfere with the towed array system. All grid points (within the 125-ft by 125-ft grid system) have been established electronically and will be used to reference any data collected in the field during the geophysical mapping effort. Any changes made to the proposed grid size and orientation will be coordinated with USACE. Weston Solutions, Inc. will use the existing coordinate system (NAD 83-New York Central State Plane) as referenced in the *EE/CA* (Parsons, 2001). During the DGM effort, WESTON will survey all hedgerows, rock walls, fences, permanent structures, etc., within the 2,500-ft radius.

6.1.6 UXO Safety and Anomaly Avoidance

A UXO team will provide support to remove surface UXO, OE, and OE scrap where these impede progress, effectiveness, or safety prior to the clearing and geophysical activities. This will be performed in all non-wooded and wooded areas. The UXO technicians will also provide support where intrusive activity is necessary to prevent accidental exposure to potentially high-explosive ordnance while placing control monuments, seeding items for the GPO, seeding items for QC, seeding items for USACE QA, or reacquiring target locations. The desired locations will be geo-referenced prior to performing intrusive activities and identified to the UXO technician(s), who will conduct a sweep with a magnetometer (if necessary) to clear the specific location**.** Once a location has been determined free of anomalies, the survey control point or seed item will be placed while a UXO technician observes the activity. In the event an area cannot be cleared (due to a significant amount of magnetic interference), another location will be chosen. During target acquisition, the UXO technicians will dig at locations specified to determine anomaly type and depth. As described in Chapter 2, UXO technicians will accompany all project personnel as necessary while working within the ODG. The GPO area will not be cleared of ordnance prior to beginning work activities in the area. Specific UXO/OE safety procedures are described in detail in the *SSHP* (Appendix D) and the *ERCP* (Appendix B of the *SSHP*), and the *Explosives Management Plan* in Section 3.

6.2 INSTRUMENT STANDARDIZATION

Requirements for instrument standardization, minimum test frequency, and acceptance criteria are outlined in Attachment B of *USACE DID OE-005-05.01*.

To verify instrument accuracy, each "sensor" will be checked at the beginning and end of each workday following the QC criteria (i.e., equipment warm-up, nulling of sensors, static, static spike, and cable shake). Additional function checks may be performed throughout the day, as the operator deems necessary. The data from each sensor will be compared with data collected on previous days. If there is a significant change in results, the instrument will be rechecked. If the difference in the data cannot be accounted for, the instrument will be taken out of service until repaired. In the event that a repair is made to the array or a replacement part (particularly metal) is added, a GPO survey will be required prior to approving the system for full-scale mapping.

6.3 DATA COLLECTION

Prior to collecting geophysical data in the field, the Site Geophysicist and/or the Geophysical Team will complete a Field Data Sheet in accordance with Attachment A of *USACE DID OE-005-05.01*, a copy of which is included in Appendix E of this WP. The Field Data Sheet will be stored with the geophysical information collected. Field personnel will collect sufficient data to produce a geophysical map for each area that shows major geophysical features. A second map that includes physical features will be used as a baseline map. The baseline map will include physical features such as:

- An aerial photo of the site
- The grid system
- 1,000 ft and 2,500 ft limits of work
- Buildings, roads, and other manmade structures
- Inaccessible areas such as heavily forested areas

The crew will provide full-color geophysical maps of each area, overlain with the grid coordinate system, providing sufficient detail and scale to show all detected anomalies.

At the completion of each survey, data stored in the data loggers will be downloaded to a field computer, and reviewed by WESTON Geophysicists. The data will be reviewed for completeness and accuracy, and comprehensive coverage in Differential Global Positioning System (DGPS). This information will be plotted on the site map to track the areas surveyed. "Holidays" or holes in the data resulting from physical obstructions will be referenced with DGPS. Data will be reacquired as needed to fill any holidays.

Geophysical map deliverables will be prepared in accordance with the format per Attachment D of *USACE DID OE-005-05.01,* a copy of which is included in Appendix E.

6.4 DATA PROCESSING, CORRECTION, AND ANALYSIS

The geophysical teams will provide the *raw* data, digital records, and field notes to the Site Geophysicist 24 hours after the day's field activities have ceased to allow for turnaround to USACE within five days. The digital data will be an ASCII-delimited file (XYZ) suitable for input into the *Geosoft*™ computer program. Initial data processing, and standard data analyses will include the procedural steps described below in Subsections 6.4.1 and 6.4.2

6.4.1 Initial Field Processing

Initial field processing will include data file QC review and correction of the following:

- Grid name and location.
- Checking precision of the navigational data - The initial QC will involve reviewing (on a daily basis) the precision of the navigational field data relative to known, geo-referenced items seeded by WESTON or USACE.
- Checking navigational data for comprehensive coverage - The data will be reviewed to locate holes or holidays in the data set that may require additional fill-in.
- Adjustments for MK2 sensor offsets with respect to the RTK antennae.
- Reviewing data sets and QC tests with respect to SN levels and acceptance criteria.

- Agreement of line numbers, survey direction, placement of fiducial locations relative to start and end points recorded in the field notes, primarily related to the hand towed surveys in the wooded areas.
- Removal of data dropouts, and spikes associated with interference sources.

6.4.2 Standard Data Analysis

Contour plots for multiple EM time gates/channels will be prepared and transposed on electronic site base maps. The plots will be used to mark the horizontal dimensions of subsurface anomalies. The GPS and EM data will be post-processed using Trimble Pathfinder, Dat61, Magmapper 2000, and Oasis montaj (UX-detect) geophysical modeling software. The crew will perform a comprehensive data analysis as described below to produce digital target tables, target maps, and identify and evaluate all geophysical anomalies detected by the geophysical instruments. Initially, the project geophysicist will process and interpret the 4-channels conducting a collective review of the respective decay characteristics. A summation of the 4-channels will be performed and the summed data will be processed as described below. The final output will include processed data for the sum of the 4-channels and will include an automatic/manual anomaly selection. The Oasis database audit log will also be reviewed as part of the QC process.

Positional Offset Correction

Positional offsets between the center of the coils and the GIS antennae will be checked and recorded daily. Offset adjustments to the center of each coil to the GPS antennae will be made in Magmapper 2000™.

Sensor Bias, Background Leveling, and Drift Correction

All geophysical instruments will be nulled (zeroed) prior to initiating data collection. Leveling and drift correction will be performed during the post processing, as the data requires. The *Geosoft*™ UX-Detect drift correction routine (UXDRIFT GX) will be used to remove an offset caused by instrument drift from a channel of data.

Latency Correction

Latency tests will be performed by traversing a spike object (i.e., metal bar) bi-directionally. Instrument latency will be corrected based on the lags or time differences observed in anomaly peak positions for the spike object. Corrections will be applied per the DQO in Subsection 6.6.2.

Geophysical Background Noise Identification

Background noise will be evaluated by first looking at the data profiles (for the summed channel) to establish an upper threshold limit that would capture all background signals. In general, depending on the level of noise observed, this upper threshold will be set between 2 millivolt (mV) and 5mV above the highest background levels observed. Once the background threshold is set, all data above this threshold will be temporarily dummied out and a statistical report will be run on the remaining data. (The objective is to minimize the influence of large amplitude anomalies on the statistics of the background readings.)

Gridding Method and Search Criteria

Gridding will be performed using *Geosoft*™ minimum curvature gridding function applying appropriate grid node spacing and blanking distance. Grid cells that are located further than the blanking distance from a valid data point will be blanked out in the output grid. Using the default values for minimum curvature gridding function, the nominal sample interval, i.e., 2*(sqrt grid area / #data points). Initially, this parameter may be set to just greater than the maximum sampling interval through which interpolation is desired. If there are too many holes in the resulting grid, the blanking distance will be increased appropriately.

The search criteria are defined in minimum curvature gridding function. The search radius is used to establish the starting grid values for the coarse grid. The default is four times the coarse grid size defined by the 'starting coarse grid'. If no data is found within the maximum search radius, the mean of the data is used as the starting value. If the search radius is too small, the

starting grid can be a poor approximation of the desired grid, resulting in excessive processing time. If too large, too much time will be consumed establishing the original coarse grid.

6.4.3 Anomaly Selection and Decision Criteria

The project geophysicist will perform an automatic anomaly selection based on the sum of the 4-channels using UX-Detect Blakely Test. GX Parameters will be refined to produce anomaly selections of all signals above the mean plus 2.5 to 3 times the standard deviation of the background data. A review of decay profiles (for all 4-channels) at all suspect and/or low-amplitude anomalies will be performed to remove anomalies (from the list) not exhibiting response characteristics typical of buried metallic objects. This step may be performed using a scripted routine that will automatically find the nearest peak and compare the values for all associated channels in order to compute, identify, and flag negative time constants. Flagged anomalies, not having decay characteristics of buried metallic objects, will be removed. A manual review of the remaining anomalies will be conducted to center the anomaly response as needed. All corrected geophysical data and anomaly locations will be exported to a database. Throughout the geophysical survey, field personnel will use logbooks to record observations such as, variances in the background interference/noise when collecting data, and/or notable changes in soil characteristics. Such observations will provide valuable insight during the selection of anomalies in areas where there is significant variations in background interference/noise.

6.4.4 Dig Sheet Development

Following the identification of potential target anomalies from the geophysical data evaluation, the anomaly locations will be digitized based on the position of the target in Universal Transverse Mercator UTM coordinates. A Target Dig Sheet and Target History database will be created to comply with the requirements of Attachment C of *USACE DID OE-005-05.01*. The Site Geophysicist will assign each anomaly a unique target identifier and will enter the corresponding information for the target into the database.

At a minimum, the following information will be included in the database for each targeted anomaly:

- Unique Target ID. Including Cell block (i.e., A19-1, [cell block/target pick])
- Easting and northing position (NAD 83-New York State Plane Coordinates)
- Channel ID
- Response amplitude
- Dig priority based on correlation to target attributes and date

The Dig Sheet will also include QC target anomalies.

6.5 ANOMALY MARKING AND REACQUISITION

As part of USACE Quality Assurance program, USACE will plant seeded items below the surface as "blind" items to the geophysical subcontractor. WESTON will record the position, target mass, type, depth, orientation, etc. prior to burying at the USACE specified depth prior to mapping. United States Army Corps of Engineers will review this information following submittal of the raw data to confirm that the target has been acquired. A QA failure shall result if the geophysical subcontractor does not detect this item during geophysical mapping and evaluation. United States Army Corps of Engineers will plant seeded items at a frequency of up to one (1) item per five (5) acre area. This frequency may be revised by USACE based on site conditions, data quality, or other site defined parameters.

In addition to the acquisition of known targets, the geophysical subcontractor will be expected to reacquire selected geophysical target anomalies as identified on the Dig Sheets as part of the USACE QA process. The anomalies to be reacquired shall be identified by USACE. Once an anomaly has been chosen for reacquisition, a reacquisition team will proceed to the survey location of the anomaly and will attempt reacquisition of the anomaly using the same type of instrumentation used for the initial geophysical survey. The anomaly will be pinpointed and a flag with the anomaly number will be placed on the apparent center of mass of the anomaly. Any anomalies where the reacquisition is ambiguous or uncertain shall be flagged as such. United States Army Corps of Engineers may require up to two anomalies/acre to be re-acquired. This frequency may also be revised by USACE based on site conditions, data quality, or other site defined parameters.

The reacquisition team will complete the appropriate columns of the Geophysical Dig Sheet and Target History database. The team will then report the anomaly to the Senior UXO Supervisor (SUXOS) as ready for excavation and identification. The SUXOS will assign a UXO team to excavate and identify the anomaly, and record the required information in the Dig Sheet and Target History databases per Attachment C of *USACE DID OE-005-05.01*. Anomaly type and depth will be recorded. Only those locations specified by USACE during the reacquisition process will be investigated to determine anomaly type and depth.

6.5.1 Horizontal Accuracy

If the horizontal accuracy of the excavated item exceeds the DQO, a reevaluation of the data, methods, and project QC will be performed. A written response explaining the occurrence, and identifying appropriate corrective actions will be submitted to USACE.

6.5.2 False Positives

False positive anomalies result when no detectable metallic materials are recovered during excavation at a given reacquired anomaly location. The DID states that if more than 15% of the anomalies reacquired and excavated in a given sector result in a false positive, then a reevaluation of the data detection method should be performed. A written response explaining the reason for the false positive result and a Corrective Action Plan, if appropriate, shall be submitted to the USACE. Limited reacquisition and excavation may be performed during this effort.

6.6 QUALITY CONTROL

Overall project QC objectives are presented in the *CQCP* included in Section 10 of this document. This chapter describes task-specific QC objectives for the DGM.

A QC program is a systematic process that controls the validity of data results by measuring the accuracy and precision of methods and analyses, developing expected control limits, using these limits to detect errors or out-of-control events, and requiring corrective action techniques to prevent or minimize the recurrence of these events. The Geophysical QC Officer will complete a

QC Frequency and Acceptance Criteria Chart in accordance with Attachment B of *USACE DID OE-005-05.01*.

Periodically, WESTON will plant seeded items on the ground surface throughout the SEAD 45 site to provide a QC check of the DGM evaluation. The frequency of these QC checks will be one (1) per data set or one per five acres of continuously surveyed area. To detect inconsistencies in the subcontractor's methods and/or instrumentation, results obtained during the subcontractor's DGM evaluation will be compared to the known location of the seeded item.

Weston Solutions, Inc. may also require the geophysical subcontractor to use the "mag and flag" technique to re-investigate areas geophysically mapped using digital techniques in order to correlate the mag and flag anomaly data in heavily wooded areas to data collected using DGM techniques. The actual locations making up the five acres will be determined by WESTON and USACE.

6.6.1 Project Quality Objectives

There are two overall project quality objectives:

1) To identify all target UXO/OE and ORS between the inner and outer radial limits of the ODG site.

2) Acquire comprehensive mapping and target data for planning, cost estimating, and executing the OE removal.

6.6.2 Data Quality Objectives

The DQOs are based on the concept that different data uses require different quality targets. Data quality is defined as the degree of certainty with respect to precision, accuracy, representativeness, completeness, and comparability required of a data set. The DQOs are both qualitative and quantitative statements specifying the quality of data required to support the project. The DQOs developed during project planning will serve as standards against which project objectives will be measured.

Throughout implementation of both the GPO and full-scale geophysical investigation activities, project personnel will be required to meet the following DQOs defined by the U.S. Army Engineering and Support Center, Huntsville:

- **Instrument latency:** Instrument latency will be corrected based on the lags or time differences observed in anomaly peak positions derived from a lag bar test described above. Corrections will be applied using an appropriate correction routine that accounts for instrument latency time and sensor velocity. "Zig-zag" or "chevron" effects should not be visible in the data maps when plotted at the scales used to detect the smallest amplitude signal for a given item. Typical latency corrections observed in the preliminary tests at the GPO were 0.3 seconds.

- **EM leveling:** For any given dataset of EM data, all data channels will be leveled using the same routines and parameters.

- **Processing:** All leveling and/or filtering routines that are applied to datasets will be evaluated, on a dataset by dataset basis, to confirm that those routines do not alter the nature of the original measured response.

- **Data acquisition rate:** Data acquisition rates should be consistent with those achieved during the GPO; 2.5 (+/- 0.3) mph.

- **Sampling density:** Along-track sampling densities should not exceed 0.5 ft. The across-track line sampling density should not exceed 3 ft (*excluding obstruction areas such as fences, hedgerows, forested areas, and individual tree*).

- **Anomaly selection:** The project geophysicist, or one of his/her designees, will certify that all anomaly selections have been performed or reviewed by them, and that they accept the anomaly selection as reasonable for the intended purpose of this project.

- **Navigation:** The sum of all data positioning errors in the final datasets will not exceed +/- 0.5 ft. This DQO is specific to the reported positions of the state-plane coordinates for each data point in the final version of geophysical data. Many factors affect DGPS accuracies, including PDOP, SNRs, base-station geodetic coordinate accuracies, carrier-phase ambiguity resolution, etc.

6.6.3 Corrective Actions

The objective of the geophysical investigation is to accurately locate and record the location of anomalies (potential UXO/OE). Based on the QC checks described in the previous section, if it appears that a particular geophysical method, instrument, or procedure is not generating meaningful results or achieving the project goals, WESTON will convene a review team within

24 hours of identifying the deficiency to investigate the cause and recommend corrective actions. If minor process modifications can be made or equipment substituted to achieve the goal, WESTON will take action to make these amendments, and USACE will receive written notification of all actions taken. If the instrument or process cannot be corrected to achieve the desired DQOs, WESTON will cease using that method/instrument and will make recommendations to USACE. These recommendations may include modifications to the *geophysical investigation plan*. Weston Solutions, Inc. will implement the amended plan upon approval from USACE.

6.7 RECORDS MANAGEMENT

All geophysical data related to the EM-61 survey will be managed using the Oasis analytical software. Descriptive attribute information about the field surveys, targets, and dig lists will be stored and maintained in a centralized, project master database in *Microsoft*® Access format. All spatial data will be managed using GIS, and will be stored in ESRI-compatible GIS file formats, primarily *ArcInfo* coverage's and *ArcView* shape files.

6.7.1 Data Organization and Storage

Descriptive Field Attribute Information:

A *Microsoft*® Access database will hold all project information related to field data and dig lists. Tablet PCs will be used for entering the field data. Attachments A and C of *USACE DID OE-005-05.01* will be developed as *Microsoft*® Access database forms, and will be the primary user interface for entering data into the database. Each database field will contain dropdown lists of database entries that are valid for that field, in order to ensure consistent data entry practices. Free form typing of database entries will be allowed, but only when information requirements warrant such broad flexibility of user input options. As the user enters data through the forms, the appropriate relational database tables will be populated with the information. Digital photographs will be stored in the database as they are taken in the field, eliminating the need to reconcile separate files at a later time. Since each tablet PC will contain only

field-collected data for any given survey session, new information must be uploaded to the project master database on a periodic basis to ensure data integrity. At a minimum, this process should occur at least once a day, and will be accomplished by uploading files through the project website.

EM-61 and GPS Survey Data

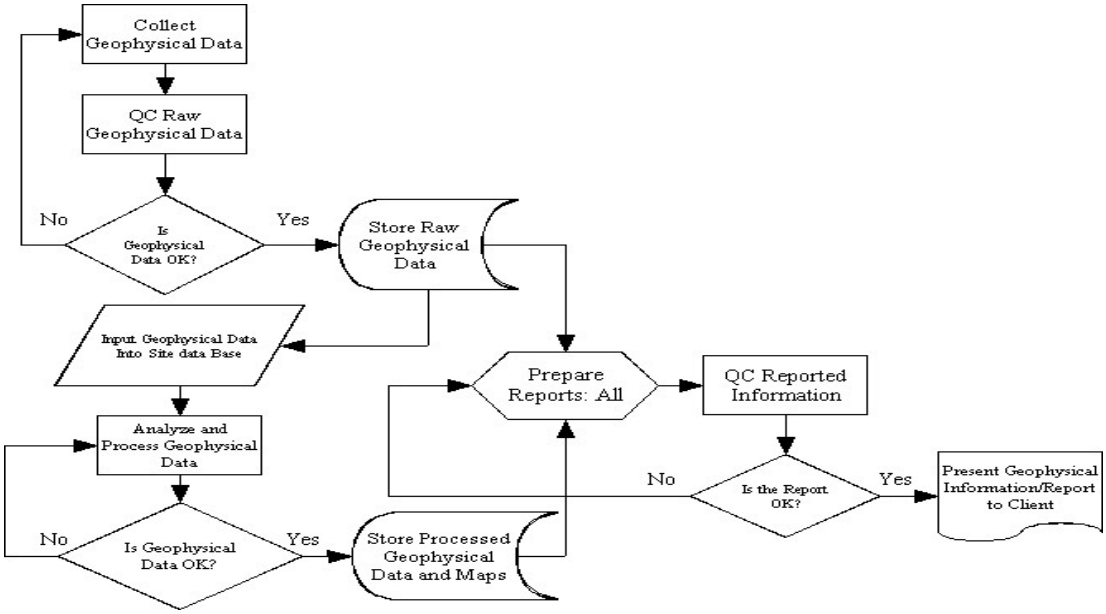
Geophysical data acquired in the field will be stored in a data logger or field PC. The data loggers will be periodically downloaded throughout the day to a laptop computer. All data will be backed up daily using a separate electronic storage device. The original data and all back-up files will be turned over to the Site Geophysicist at the end of each day. Information will remain stored on the hard drive of the laptop computer as additional back-up.

A standardized format for the file names will be used and documented throughout the duration of this project. Data will be organized into directories that are labeled by the collection date. After data processing begins, the data will be organized into separate directories that are tied to the geographic or grid location that it came from. In addition, the geophysical team personnel will maintain field notes in a logbook that will be used to help the Site/Project Geophysicist evaluate the collected data. Field notes will include information and observations of the physical area surrounding the location where the data is collected, as well as information that are directly relevant to the survey geometry. Field notes will be stored in the same directory/folders as the raw and processed geophysical data.

A geophysical data flow chart is shown in Figure 6-1.

Figure 6-1

Geophysical Data Flow



6.8 INTERIM REPORTING AND SUBMITTALS

Geophysical mapping progress will be submitted to the Project Geophysicist for review on a daily basis. A description of the area where the data was collected, and the environmental conditions encountered at the time of data collection, will be included with the electronic data. Parsons Engineering will submit a copy of initial raw data to WESTON on the day of collection. Following a QC check WESTON will submit the raw data to USACE within 24 hours. Upon approval from USACE, Parsons' Project Geophysicist will transmit the finalized data to both WESTON and USACE within five working days, along with a Letter of Transmittal conveying explanations and pertinent information.

6.9 MAP FORMAT

Maps will be prepared and submitted in accordance with the requirements specified in Attachment D of *USACE DID OE-005-05.01*.

6.10 SITE RESTORATION AND DEMOBILIZATION

Upon completion of the DGM investigation and related activities, all equipment, temporary structures, and other items utilized during fieldwork will be removed from the project site.

SECTION 7

LOCATION SURVEYS AND MAPPING PLAN

7. LOCATION SURVEYS AND MAPPING PLAN

7.1 GENERAL

Weston Solutions, Inc. will be performing survey activities within the ODG during the clearing and geophysical activities. However, most of WESTON's surveying activities will be used for QC purposes. Weston Solutions, Inc.'s survey work will include:

- Establishment of control points.
- Grid Identification (as needed).
- Radius Identification.
- Identification and record keeping for seeded items in GPO plots.
- Identification and record keeping for seeded items in the general work grids.
- Identification of "manmade" objects and UXO during surface inspection.
- Work progression tracking.
- Random QC checks on identified anomalies.

All of WESTON's surveying will be conducted utilizing a Trimble 5700 RTK GPS Total Station (RTK). The RTK base system will establish local control from existing benchmarks on-site. Weston Solutions, Inc. is in possession of the survey control point cards. A firm supplying a New York State Licensed Land Surveyor will install additional survey control points. These control points will be located within the actual limits of the ODG for use at a later date or during the full-scale geophysical.

The geophysical subcontractor will be conducting all of the surveying in regards to anomaly identification during the geophysical. This survey along with the other surveys will be in accordance with the following plan.

7.2 UNEXPLODED ORDNANCE

During all field surveying within the limits of the ODG, WESTON will have available to each survey crew a UXO Technician II to conduct visual surveys for surface ordnance. Sub-surface surveys will be performed only at locations designated to acquire target confirmation utilizing a magnetometers. If the need to go intrusive arises (i.e., installing survey monuments), then a thorough sub-surface survey will be conducted to ensure there is no ordnance located in the area.

7.3 ACCURACY

Weston Solutions, Inc. and its subcontractors will utilize survey control monuments with a "Class I, Third Order" control. All coordinates will be in English units utilizing the North American Datum of 1983 (NAVD88) New York Central State Plane Coordinate System for horizontal control. Vertical control will be conducted using the NAVD88. Aerial photographs used for survey purposes will be held to the same horizontal and vertical accuracy and requirements as stated above.

All newly formed and recovered monuments will be permanent in nature. They shall consist of concrete monuments with a domed brass plate in the center distinguishing the exact point of reference. The northing, easting, and elevation for all control points and other relevant points shall be presented in a certified letter or drawing to WESTON for submittal to USACE.

Weston Solutions, Inc. will provide the geophysical firm with an electronic version of the 125 ft by 125 ft grid that will be used to delineate the ODG area. This grid will be generated using an *AutoCad* program, and will be based off of existing control points within the ODG area. The geophysical firm will be responsible for supplying WESTON with accurate data based on this grid.

7.4 PLOTTING/MAPPING

The surveying subcontractor shall submit original drawings of the survey monument locations along with a table of the survey data generated listing the X,Y,Z-coordinates in *Microsoft*® Excel CSV files. The ACAD and Excel information shall also be submitted on a CD as a .dwg file. The as-built drawings will be prepared at a scale of 1 inch equals 200 ft. A copy of all field notes and calculations generated shall also be provided. A daily report shall be provided to WESTON at the close of business each day which details the following: Company name, name of surveyors on-site, duties, arrival and departing time, work performed by the time period weather and conversations. The location, identification, coordinates, and elevations of all the control points recovered and/or established shall be plotted on reproducible media for planimetric or

topographic maps. Each control point shall be identified on the map by its name and number and the final adjusted coordinates and elevations (to closest 0.001 m and 0.01 ft).

The geophysical subcontractor is also required to submit original drawings and coordinates of the data collected during the survey in the same format as discussed above. The geophysical reporting requirements are discussed in more detail in the *Geophysical Investigation Plan* in Chapter 6.

7.5 DIGITAL DATA

Weston Solutions, Inc.'s submittals to USACE for the geophysical survey will be provided in a digital ".dgn" files or files compatible with USACE software. Weston Solutions, Inc. is establishing a GIS system that will contain all data gathered in the geophysical survey. This includes all target lists, mapping data, and plots generated from the data. This GIS system will be made available to USACE and other personnel involved in the project.

Weston Solutions, Inc. is not anticipating on collecting topographic data as part of the geophysical investigation since general topographic data is already on file. However, spot elevations may be collected to verify data on file.

7.6 DIGITAL FORMAT FOR SURVEY/MAPPING DATA

All survey and mapping data will be collected and reported in accordance with *USACE DIDs OE-005-05.01, OE-005-14.01*, and the 25 March 2003, SOW and WP at a minimum.

SECTION 8

WORK, DATA, AND COST MANAGEMENT PLAN

8. WORK, DATA, AND COST MANAGEMENT PLAN

Not applicable to this Task Order.

SECTION 9

PROPERTY MANAGEMENT PLAN

9. PROPERTY MANAGEMENT PLAN

Not applicable to this Task Order.

SECTION 10

QUALITY CONTROL PLAN

10. CONTRACTOR QUALITY CONTROL PLAN

This Contractor Quality Control Plan (CQCP) was developed to identify and implement quality requirements to ensure that overall project activities are accomplished using an acceptable level of internal controls and review procedures. The intent of such controls is to eliminate conflicts, errors, and omissions and ensure the technical accuracy of all deliverables. This plan was prepared with guidance from *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, the *Office of Toxic Substances Guidance Document for the Preparation of Quality Assurance Project Plans*, dated 9 September 1987.

As previously described, WESTON will conduct a geophysical investigation and anomaly identification at the SEAD 45 ODG located within SEDA. The data will be collected using DGM techniques, and will be used to develop a database that contains the location and identification of all potential OE/UXO and OE-related scrap found within the ODG. The information will also be used to refine acreage estimates for the different remedial zones outlined in the *EE/CA* (Parsons, 2001) and to provide an accurate cost estimate for future full-scale removal activities at the ODG.

Fieldwork under this task order shall include the following:

- Mobilization of construction equipment and personnel to the project site.
- Site preparation including installation of drainage and erosion control measures as necessary, site surveying to delineate work areas, location of existing control points, installation of up to five new benchmark monuments, delineating the inner and outer ODG radial limits, and establishing site clearing limits.
- Site clearing including removal of brush and vegetation less than six inches in diameter.
- Geophysical Prove-Out and Full-Scale Geophysical Mapping.

- Unexploded Ordnance support including surface inspection and removal and destruction of any surface OE/UXO prior to and during clearing and geophysical sitework.
- Demobilization of equipment and personnel.

The requirements presented in this CQCP are intended as overall QC requirements that are applicable to all administrative, engineering, and technical activities associated with the geophysical investigation and mapping effort at the ODG. The requirements of this plan are also applicable to all WESTON-affiliated project support groups and their subcontractors unless an alternate QC Plan, which is consistent with or exceeds the requirements of this document either in whole or in part, is used. Specific QC requirements per *DID OE-005—05.01* that relate to the geophysical investigation and mapping effort are described in detail in Subsection 6.6 of the WP.

10.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

Under the direction of USACE, WESTON will provide a staff of experienced administrative and technical professionals to serve as key personnel responsible for implementing QC requirements associated with this project. These personnel will be selected for their management and technical abilities, and will include the following core employees:

- Program Manager
- Project Manager
- Unexploded Ordnance Safety and Quality Control Officer
- Project Engineer*
- Site Manager/Quality Control Geophysicist
- Survey Technician

Note: *Requires training

All QC personnel have successfully completed the *Army Corps of Engineers Construction Quality Management for Contractors Training Program* (except where noted). Some individuals may be required to perform multiple functions in order to efficiently maintain progress at the site. A discussion of WESTON roles and responsibilities is presented in Section 2 of the WP.

10.2 QUALITY REQUIREMENTS

The quality requirements associated with field activities in support of this task order are defined in Table 10-1. These requirements apply to all field activities that affect the quality of work and work products.

Quality Control checks will be conducted as follows:

- **Daily Briefings** - The UXO SQCO will ensure that daily safety and operational briefings are conducted routinely.
- **Communications** - Positive communications with the USACE COR and site personnel will be maintained throughout the workday.
  - At a minimum communication checks will be conducted each morning prior to starting work. Additional checks will be performed as necessary throughout the workday to monitor progress, safety, and/or QC.
  - Teams will not start operations until satisfactory checks have been achieved.
- **Training** - The UXO SQCO will ensure that initial site-specific training is performed for all field personnel prior to startup of field activities, and that all safety control measures have been established. Training will be accomplished using only approved training materials. The SQCO will ensure that all certifications are filed on-site and are available for USACE inspection.
- **Documentation** - The UXO SQCO and QC Geophysicist will ensure the completion of all documentation listed in Subsection 10.2.1.
- **Review** - The QC Geophysicist/Site Manager will be responsible for supervising all site activities including the following:
  - Supervision of WESTON and WESTON subcontractor forces.
  - Compliance with WESTON's WP, CQCP, and SSHP.

Table 10-1
Geophysical Investigation and Mapping
Rapid Response Action – SEAD 45 Open Detonation Grounds
Seneca Army Depot Activity

Objective	Activity	Activity Quality Requirement	Quality Control Verification
Prepare Site	Mobilization and Site Preparation	Mobilize equipment and personnel, and prepare site as described in the WP.	▪ Daily Site Health and Safety Meeting Report ▪ Rapid Response Weekly Projected Activities Summary ▪ Field Logbooks
Site-work	* Site Clearing	Clear approximately 380 acres of brush and small vegetation less than six inches in diameter.	▪ Prep./Initial/Follow-up/Completion Inspection Checklist ▪ QC Daily Report ▪ Daily Site Health and Safety Meeting Report ▪ Daily Equipment Checklist ▪ Weekly Status Report ▪ QA Audit Checklist and Audit Form ▪ USACE Equipment Inspection Form ▪ Health and Safety Compliance Inspection ▪ Field Logbooks
Site-work	* GPO and Full-Scale Geophysical Mapping	Perform geophysical prove-outs, and geophysical mapping of 100% of lightly wooded areas and 20% of heavily wooded areas using both towed-array and manual “skirt mod or hand held” systems.	▪ Prep./Initial/Follow-up/Completion Inspection Checklist ▪ QC Daily Report ▪ Daily Site Health and Safety Meeting Report ▪ Daily Equipment Checklist ▪ Weekly Status Report ▪ QA Audit Checklist and Audit Form ▪ USACE Equipment Inspection Form ▪ Health and Safety Compliance Inspection ▪ Field Logbooks

Table 10-1 continued
Geophysical Investigation and Mapping
Rapid Response Action – SEAD 45 Open Detonation Grounds
Seneca Army Depot Activity

Objective	Activity	Activity Quality Requirement	Quality Control Verification
Site-work	UXO Support	Site inspection by UXO technicians during all sitework. To include UXO demilitarization and disposal as necessary.	▪ QC Daily Report ▪ Daily Site Health and Safety Meeting Report ▪ Daily Equipment Checklist ▪ Weekly Status Report ▪ QA Audit Checklist and Audit Form. ▪ USACE Equipment Inspection Form ▪ Health and Safety Compliance Inspection ▪ Field Logbooks
Site-work	Demobilization	Demobilize equipment and personnel according to schedule.	▪ Daily Site Health and Safety Meeting Report ▪ Weekly Status Report ▪ Health and Safety Compliance Inspection ▪ Field Logbooks

▪ Denotes definable work feature. Detailed QC measures for these activities are further detailed in the WP.

- Adhering to the contract schedule.
- Review and submission of all daily and weekly job status reports and documentation.
- Communicate directly with the PM daily, at a minimum.

10.2.1 Field documentation

All field activities affecting QC will be performed in accordance with documented procedures, instructions, or drawings identified in the SOW, WP, or applicable DIDs. During all field activities, WESTON will use the following reporting forms:

- Preparatory/Initial/Follow-up/Completion Inspection Checklist
- Daily Site Health and Safety Meeting Report
- Daily Equipment Checklist
- Rapid Response Quality Control Daily Report
- Weekly Status Report
- Rapid Response Weekly Projected Activities Summary
- Quality Assurance Audit Checklist and Audit Form
- U.S. Army Corps of Engineers Equipment Inspection Form
- Health and Safety Compliance Inspection
- Field Logbooks

All forms will be filed on-site and completed daily or as necessary based on the QC function of the associated activity. Copies of these forms will be submitted to the USACE upon request or distributed at the Preconstruction Meeting prior to any fieldwork. Although the above forms will be used to document QC, the Trimble-RTK GPS system will be used to verify performance-based criteria on a daily basis.

The WESTON Site QC Officer will maintain a field logbook of the inspection and test activities. This daily logbook will be used in preparing the Rapid Response QC Daily Report. The Rapid Response QC Reports will be submitted daily unless approved otherwise by the USACE Rapid Response Design Manager. All other documentation will be submitted with the Weekly Status Reports to the USACE Rapid Response Design Manager and USACE PM (at a minimum). Reports will not be submitted for days on which no work is performed. At a minimum, one report will be submitted for every seven days of no work and on the last day of a period of work

stoppage. Daily Reports will be signed and dated by the Site Manager/QC Geophysicist. Weekly Status Reports will be signed by the PM.

The Rapid Response QC Daily Reports and the Rapid Response Weekly Projected Activities reports shall include summaries of the following:

- Contractor/subcontractors and responsibilities.
- Equipment used, with any idle or downtime noted.
- Location, personnel, and description of work for each day.
- Test and/or control activities performed. Any deficiencies to the specifications will be noted along with the corrective action taken.
- Quantity of materials received at the site. For all materials received, acceptability, storage, and compliance with specifications will be noted.
- Review of submittals.
- Off-site surveillance activities.
- Safety evaluations including a description of inspections, results, and any corrective actions.

10.3 AUDITS

Field performance will be evaluated to ensure that the quality standards and objectives of the WP are met. The evaluation will be accomplished through audits of the Rapid Response QC Daily Reports. Audits will be conducted and corrective actions will be implemented when non-conformances or deficiencies are identified. Additional audits will be conducted periodically. The audits will be planned and conducted by the Program or Project QC Manager, Site QC Geophysicist or the Site Safety and Health Officer. Procedures for auditing activities will be identified prior to implementation of the audits.

The audit process will involve identifying non-conformances or deficiencies, reporting and documenting them, initiating corrective actions through appropriate channels, and following up with a compliance review. Records will be kept of all auditing tasks and findings on the QA Audit Checklist and Audit Notes. In addition, copies of the audit findings will be provided to USACE within one week of completion of the audit.

The field teams involved with all sitework are responsible for reporting any suspected technical non-conformances or deficiencies to the Program Manager. The Program QC Manager and QC Geophysicist is responsible for evaluation of the situation and taking action, if any is required, after following the notification protocol.

SECTION 11

ENVIRONMENTAL PROTECTION PLAN

11. ENVIRONMENTAL PROTECTION PLAN

In order to prepare the site for geophysical mapping activities, the majority of the vegetation located within the 380-acre area, (i.e., the area between the 1,000-ft radius and 2,500-ft radius) consisting mainly of scrub grass and trees, will be cleared of all vegetation to the extent necessary for equipment access, for line-of-sight, and for GPS control. The predecessor and successor activities to this task (UXO inspection and geophysical mapping) are expected to have very little impact on the ODG environment, since these are both non-invasive and non-intrusive activities. However, the vegetative clearing will be performed in two main areas; the open fielded areas (non-wooded vegetation) and the heavily forested areas (wooded vegetation). While the non-wooded and wooded vegetative areas consist mainly of tall grasses, thick brush, and trees, several environmental sensitive areas exist which may need to be. This includes seasonal water bodies, wetlands, and perennial streams. All environmentally sensitive areas will be identified prior to clearing activities and preserved to the extent practicable.

Prior to site activities, WESTON, along with USACE, will review the areas of concern within the planned work area. These areas will be delineated on a site map and relayed to all subcontractors working within the site boundaries. The areas that will be focused on include Reeder Creek, wetlands surrounding Reeder Creek to the southeast, and the grasslands. Weston Solutions, Inc. anticipates that only 20% of the heavily forested areas will be disturbed by clearing activities. In the open areas, all trees greater than 6 inches in diameter will be left in place. All other vegetation will be cut, removed and stockpiled on site.

11.1 ENDANGERED SPECIES

Weston Solutions, Inc. reviewed the NYSDEC List of Endangered, Threatened, and Special Concern Fish and Wildlife Species as part of the Fish, Wildlife and Marine Resources Endangered Species Program. Although New York State has over 100 species of mollusks, insects, fish, amphibians, reptiles, birds, mammals that are endangered, threatened, or of special interest, only five have been identified at SEDA (none specifically at the ODG site). Of the species known to inhabit the area, identified through the *Montezuma National Wildlife Refuge*

(U.S. Fish and Wildlife Service, 1990, 1991) and the NYSDEC, five have been identified as rare species (three plant and two bird). The rare plant species of concern include: Large Leaf Aster, Northern Reedgrass, and Rough Avens. The rare birds include Osprey, and Northern Harriers. In the event that endangered or protected species are identified during site activities, WESTON will immediately notify USACE prior to conducting further work in the area.

11.2 WETLANDS

Approximately fifteen wetland areas have been located within the ODG as shown on the U.S. Fish and Wildlife Service *Wetlands and Deepwater Habitats Map* (March, 2000). The types of wetlands identified include the following:

- Palustrine Emergent Wetlands (5)
- Palustrine Forested Wetlands (5)
- Paulstrine Scrub-Shrub Wetlands (2)
- Palustrine Unconsolidated Bottom Wetlands (2)
- Riverine Streambeds (Reeder Creek)

All of the above-listed areas are predominant East of the OBG center mainly in heavily wooded sections. Brush clearing and geophysical mapping will only be conducted within 20% of heavily wooded areas, and environmentally sensitive areas such as those listed will be delineated and avoided unless otherwise directed by USACE. The majority of the wetlands identified are small seasonal bodies of water with the exception of Reeder Creek. Weston Solutions, Inc. will avoid performing any clearing activities within these areas.

11.3 TREES AND SHRUBS

Weston Solutions, Inc. will have to mow/cut approximately 295 acres of land. This area is delineated into two distinct types. Non-wooded is an area that contains grasses, brush, bushes and small trees. This area will be cleared using a brush hog and/or a Hydra-Ax. Once the area within the non-wooded area has been removed, heavy brush and grasses that were not mulched by the equipment will be picked up and brought to a central stockpile (if necessary). Weston Solutions, Inc. and its subcontractor will maneuver around single-standing trees in these open areas to prevent a clear cut of the area.

The second, wooded vegetation, consists of large trees and vegetation that will have to be removed with means other than mowing. Approximately 35% of the site is made up of wooded vegetation; however, only 20% of the wooded area will have clearing activities conducted on it. Clearing within the wooded vegetation areas will be performed on an as need basis. Only the areas within wooded locations that require geophysical mapping will be cleared. Any cleared material will be removed out of the way or pushed aside for the geophysical team.

11.4 DUST CONTROL

During surveying, UXO inspections, tree clearing, and geophysical activities, it is expected that minimal concentrations of airborne dust will be generated, since the activities are mainly extrusive and will not involve the disturbance of soil. Weston Solutions, Inc. is planning on leaving all vegetation to a height of between 4 to 6 inches. In the event dust is generated, engineering controls will be established to minimize airborne concentrations. The highest potential for creating dust exists from accessing the site via existing gravel roads. Where necessary, WESTON will decrease vehicle speeds to prevent dust migration in these areas. The posted speed limit within the ODG will be strictly enforced at 15 mph.

11.5 SPILL CONTROL/PREVENTION

Weston Solutions, Inc. will maintain a spill response kit on site containing absorbent pads and booms, as well as a salvage drum. Prior to accepting equipment on-site, the equipment will be visually inspected by WESTON (at a minimum) to ensure that equipment is in proper working order and free of leaks. Machinery will be required to pass the inspection prior to using on-site. Equipment that is questionable will be removed until repaired. In the event a leak is detected following the inspection during routine use on-site, the equipment will be shutdown, the resulting liquid removed and/or overpacked (if required), and the equipment will be removed until the necessary repairs are made. Spill control measures and prevention will be heavily stressed during activities along Reeder Creek and any adjacent areas in close proximity to wetlands.

Liquids delivered to the site by WESTON or subcontractors, such as decon fluids and diesel fuel, will be stored in the proper containers. Fuel tanks will stored in double containment cells and will be grounded unless refueled directly on a daily basis. Flammable liquids will be stored in the flammable storage cabinet next to WESTON's storage container.

11.6 ACCESS ROUTES

All primary access to and from the ODG site will be performed on existing base bituminous or gravel roads. Secondary roads will be established along existing fire lanes (i.e., areas maintained by the SEDA personnel) to access specific areas within the ODG site. All posted speed limits and rules and regulations as per SEDA will be followed. Travel within the ODG area, especially within areas that have not yet been cleared of vegetation will be strictly monitored to ensure the safety of ground personnel. All access areas will be cleared of debris to allow for safe equipment access for vehicles.

Access to SEDA will be through Post Gate No. 2 located off of Route 96A. Weston Solutions, Inc. personnel and will maintain keys to this gate and will control entry and exiting to the site. All personnel will be required to sign the logbook located in the WESTON office prior to entering and exiting SEDA. Personnel will also be required to sign the logbook located at the range control office prior to entering or exiting the ODG.

The hospital route from WESTON's office (Post Gate No. 2) to Geneva General Hospital located in Geneva, New York is included in this plan. This will be reviewed thoroughly during the personnel safety indoctrination that every person must receive by the Site Safety and Health Officer prior to beginning work.

11.7 SITE CLEANUP

Weston Solutions, Inc. and its subcontractor's will maintain housekeeping throughout the project to avoid any impacts associated with the staging of temporary construction materials. Following completion of site activities, WESTON will notify USACE and will perform a final inspection to

ensure acceptance of the site. All temporary construction materials and equipment will be removed unless directed otherwise by USACE.

SECTION 12

INVESTIGATIVE DERIVED WASTE PLAN

12. INVESTIGATIVE DERIVED WASTE PLAN

Not applicable to this Task Order.

SECTION 13

GEOGRAPHICAL INFORMATION SYSTEMS PLAN

13. GEOGRAPHICAL INFORMATION SYSTEMS PLAN

13.1 GENERAL

The GIS plan describes how GIS technology will be used to manage geospatial data related to the Seneca ODG geophysical survey.

All spatial data shall conform to the CADD/GIS Technology Center Spatial Data Standards for Facilities Infrastructure and Environment. Geographic Information Systems data shall be stored and managed using ESRI *ArcGIS* software, and will be spatially referenced to the NAD 1983, New York Central State Plane Coordinate System. Metadata shall be created for all GIS layers managed by WESTON on this project, and shall conform to Federal Geographic Data Committee metadata standards.

13.2 ARCGIS AND MICROSOFT ACCESS

ArcGIS and *Microsoft*® Access will be used to centrally store and manage all geospatial data (e.g., any data element that can be referenced to a location). Corrected GPS data shall be processed through and managed within the context of the GIS database.

The color grid images displaying the results of the EM-61 surveys shall reside in a high-resolution image file format (e.g., GeoTIFF or MrSID) and will be georeferenced to the project-standard coordinate system (NAD 1983, New York Central State Plane). Managed in this manner, these images will be usable with both GIS mapping software and geophysical analysis software.

Anomalies derived from the EM-61 surveys will be catalogued in a *Microsoft*® Access database. Each database record shall contain discrete map coordinates (northings and eastings, spatially referenced to NAD 1983, New York Central State Plane) and all pertinent descriptive attribute information in conformance with the DQOs outlined in *USACE DID OE-005-05.01*.

Any baseline grid information or additional planimetric features collected during the course of the survey shall be processed through and managed by the GIS, and will ultimately reside in a vector-based ESRI GIS software file format.

13.3 COMPUTER FILES.

All final document files shall be furnished in IBM-PC compatible *Microsoft*® Office 97 or higher software and in *Adobe*® Portable Document Format. Products shall be suitable for viewing, without modification, on the Internet. Freeware versions of *Adobe*® Acrobat Reader and Internet browser software, as appropriate, shall accompany the document files on CD-ROM, so that the user can use the CD to either install the programs and documents on a machine, or use the CD in a stand alone mode to view the document files. In submissions with multiple CDs, only one copy of the viewers will be included, on the first CD of the series.

At the close of the project, all GIS data shall be submitted in non-proprietary Spatial Data Transfer Standard format, as well as in the proprietary format used for the execution of the project, specifically *AutoCAD 2000* and ESRI *ArcGIS* shapefiles, coverages, and geodatabases. Pertinent in-progress and field GIS data, design drawings, survey data, relational databases, geophysical data, and other related data will be made available online to the government on the project website. Limited online mapping of anomalies and EM-61 survey grids will be provided, with built-in query functionality of the anomaly data layer. All formal GIS data submittals will be made on PC CD-ROM. Each submittal shall be accompanied by a freeware viewer application appropriate for reviewing the proprietary formatted GIS data (e.g., *ArcExplorer* for ESRI format shapefiles and coverages). Instructions will be included with each submittal for loading the data and viewer application. No other additional software shall be required, and no data modification shall be required for viewing the submittal.

SECTION 14

INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS

14. INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS

Not applicable to this Task Order.

SECTION 15

PHYSICAL SECURITY PLAN FOR RCWM PROJECTS SITES

15. PHYSICAL SECURITY PLAN FOR RCWM PROJECTS SITES

Not applicable to this Task Order.

SECTION 16

REFERENCES

16. REFERENCES

Office of the Federal Register National Archives and Records Administration. *Code of Federal Regulations, Part 1926*, Revised as of 1 July 1999.

Office of Toxic Substances Guidance Document for the Preparation of Quality Assurance Project Plans *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, 9 September 1987.

Parsons Engineering (Parsons) *Engineering Evaluation/Cost Analysis (EE/CA),* September 2001

USACE, *Safety and Health Requirements Manual*, EM 385-1-1, 3 September 1996

U.S. Army Engineering and Support Center, Huntsville, AL. (USACE) *Type ll Work Plan* New Number EO-001, Revised 3 March 2000.

USACE Huntsville, AL. *Technical Management Plan* New Number EO-005-02, Revised 3 March 2000.

USACE 2000. *Explosives Management Plan* New Number EO-005-03, Revised 3 March 2000.

USACE 2000. *Geophysical Investigation Plan* New Number OE-005-05, Revised 3 March 2000.

USACE 2000.*Site Safety and Health Plan* New Number OE-005-06, Revised 3 March 2000.

USACE 2000. *Location Surveys and Mapping Plan* New Number OE-005-07, Revised 3 March 2000.

USACE 2000. *Geographic Information System Plan* New Number OE-005-14, Revised 20 March 2000.

USACE 2000. *Monthly Status Report* New Number OE-080, Revised 3 March 2000.

U.S. Army Engineering and Support Center (USACE). Huntsville, Alabama *Type I1 Work Plan USACE DID OE-005-01-01,* Revised 1 October 2002

U.S. Fish and Wildlife Service *Montezuma National Wildlife Refuge*, 1990, 1991

U.S. Fish and Wildlife Service *Wetlands and Deepwater Habitats Map,* March, 2000

APPENDIX A

TASK ORDER SCOPE OF WORK

Final
Scope of Work
for
Rapid Response Action

Geophysical Investigation
Open Detonation Grounds
at
Seneca Army Depot Activity
Romulus, New York

Contract Number DACA45-98-D-0004
Task Order #037

25 March 2003

1. Introduction.

1.1. General. This Rapid Response project executes a time sensitive geophysical investigation at the Seneca Army Depot Activity (SEDA), Romulus, New York. Ordnance and explosives (OE) exist on the property. This geophysical investigation is intended to provide detailed mapping of potential OE on the Open Detonation Grounds for removal actions at a later date. The general project requirements include development of detailed project work plans, clearing and grubbing as necessary, general site security, performance of appropriate geophysical investigations, and preparation of project reports including surveys and mapping.

1.2. Project Request. The U.S. Army Corps of Engineers, New York District has tasked the Omaha District Rapid Response to execute the geophysical investigations for this time sensitive support action. This action by the Omaha District Corps of Engineers, through use of the Rapid Response Program, is in support to the New York District execution of mission. This Scope of Work (SOW) specifies the project plans, anticipated field work requirements, management support and necessary documentation required to complete this action under the Rapid Response Contract, DACA45-98-D-0004, Task Order No. 0037. A cost reimbursable- fixed fee task order will be issued to Weston Solutions, Inc. to accomplish this work. Project site work shall comply with all Federal, State, and local laws and regulations.

1.3. Background. The work required under this scope of work falls under the Base Realignment and Closure (BRAC) program. OE is a safety hazard and may constitute danger to site personnel and the local population if improperly managed. All activities involving work in areas potentially containing unexploded ordnance (UXO) hazards shall be conducted in full compliance with USACE, DA and DoD requirements regarding personnel, equipment, and safety procedures. 29 CFR 1910.120 shall apply to on-site activities.

1.4. Location. The Seneca Army Depot is a US Army Facility located in Seneca County, New York near the town of Romulus. SEDA occupies approximately 10,600 acres. The area surrounding SEDA is generally used for farming. See Appendix A – Site Location Map.

2. <u>Specific Project Requirements.</u> The objective for this task order is to develop detailed geophysical surveys, mapping and database development as described in Appendix B – Geophysical Investigation Requirements. The Contractor shall identify and adhere to all legally applicable or relevant and appropriate requirements (ARAR's) for this geophysical investigation. In addition, the Contractor shall be required to review and adhere to the applicable OE regulations and procedural documents that are listed on the USACE, Huntsville Center, Ordnance and Explosives Mandatory Center of Expertise web page including Engineering Regulations, Pamphlets, Manuals and Data Item Descriptions (DID's). The Contractor shall assess all applicable data and documents, develop all work plans, provide all performance specifications (as required), submit cost proposals and perform all related work based on the following tasks:

2.1. Task I - Site Visit and Document Review. The Contractor may perform a site visit, as necessary, and review all pertinent documentation including the Ordnance and Explosives – Engineering Evaluation/Cost Analysis Report for Seneca Army Depot, prepared by Parsons Engineering Science, Inc. The purpose of this task is for the Contractor to gain additional information about specific site conditions and prior investigative activities. Preceding any site visit activities, the Contractor must obtain prior approval from the Contracting Officer Representative and assure coordination with the Site OE Safety Specialist.

2.1.1 Geophysical Investigation - Area of Consideration. An Engineering Evaluation has previously been performed at the Open Detonation Grounds. This document shall be reviewed thoroughly prior to commencement of any field activities. Essentially, there are three distinct areas of consideration as follows:

- **Area 1** is the immediate detonation area including the detonation berm. This 70-acre parcel is contained within an approximate 1000-foot radius of the detonation berm. Geophysical mapping is not anticipated in this area.

- **Area 2** is located outside Area 1 from the 1000-foot radius out to a distance of 2000-feet from the demolition berm. This area is approximately 220 acres in size. Geophysics will be performed in this area.

- **Area 3** is located between the 2000-foot radius and 2500-foot radius from the detonation berm. This area is approximately 160 acres in size. It is anticipated that only surface OE and related materials are located in this area. This area must be investigated for the presence of surface OE/UXO and swept prior to geophysical investigations. The Contractor shall evaluate the cost effectiveness of performing full-scale geophysics in this area and provide recommendations prior to full-scale field activities. Geophysics and clearing will be required in this area, and minor site clearance may be required.

2.2. Task II – Project Work Plans. The Contractor shall prepare the following project work plans. These plans shall include a detailed discussion of the technical approach the Contractor plans to

use to implement the requirements specified herein and in accordance with Contract Number DACA45-98-D-0004, including applicable Advanced Agreements to this contract. The plan must be reviewed and approved by the USACE Project Manager prior to commencement of any site work.

2.2.1. Geophysical Investigation Work Plan. The Contractor shall prepare the Geophysical Investigation Work Plans (WP), which discuss each specific task required by this Scope of Work (SOW) and explains how the Contractor plans to implement its resources to fulfill all the requirements herein. Specific geophysical requirements are detailed in Appendix B – Geophysical Investigation Requirements. This portion of the work plan will provide the operational plan necessary to successfully complete this project.

2.2.1.1. The WP shall outline in detail the methods used for all site clearing activities and procedures used for site safety, traffic management, erosion control, and site maintenance activities. This portion of the work plan shall also include detailed maps of the areas of consideration and how the contractor proposes use of equipment in each distinct area, such as open versus wooded areas.

2.2.1.2. The WP shall contain a section outlining key personnel (including their resumes) to be used on the project and their responsibilities. Key personnel shall be defined as all salaried professionals (both on-site and home office), the site supervisor, and any wage grade personnel key to the execution of this task order. The Contractor shall notify the USACE Contracting Officer Representative, in writing, of any changes in key personnel during the course of the execution of this task order within 24 hours of such change.

2.2.1.3. A detailed project schedule shall be included in the WP, which incorporates this SOW and presents the length of each individual task and subtasks, interrelationship between each task and other key milestones. The WP shall discuss all permits, licenses, and certificates required for this investigation.

2.2.2. Site Safety and Health Plan (SSHP). The Contractor shall prepare a project specific SSHP in accordance with the requirements specified in Appendix C – Health and Safety Requirements, the Explosive Safety Submission (ESS) - "Ordnance and Explosives Removal at the Open Detonation (OD) Grounds, Seneca Army Depot Activity, September 2002", and DID-OE-005-06.01. This section of the work plan shall also include monitoring requirements established for the project.

2.2.3. Emergency Contingency Plan. The contractor will be required to prepare an Emergency Contingency Plan to include OE hazard identifications and potential exposure to OE hazards and chemicals, actions to be taken to prevent exposure, site monitoring, emergency notification procedures, personnel responsibilities, emergency phone numbers, and a map indicating directions to the nearest hospital.

2.2.4. Site Specific Advanced Agreements (SSAA). The Contractor shall specify relevant Site-Specific Advanced Agreements, to be included in the Cost Proposal, and agreed upon by the Government and the Contractor. Only those relevant SSAA's applicable to this project shall be

considered part of this Scope of Work. The costs associated with developing and negotiating the Site-Specific Advanced Agreements are not cost reimbursable.

2.3. Task III - Mobilization/Demobilization.

2.3.1. Mobilization. The Contractor shall mobilize all necessary equipment, personnel and materials to the project site as needed to successfully complete the requirements of this SOW and other contract documents. The Contractor shall specify the equipment, personnel, and their respective location from which mobilization will occur, anticipated travel time, and material requirements in the Work Plan.

2.3.2. Demobilization. The Contractor shall demobilize all Contractor personnel, equipment and materials from the project site following completion of all field investigative work. All materials and equipment used on this project shall be documented in the final report.

2.4. Task IV – Surface Preparation, Clearing, and OE Identification/Removal. The Contractor shall provide all necessary qualified personnel and equipment to perform surface preparation, surface OE identification, site clearing and any removal or Blow-in-Place (BIP) as required for surface OE or UXO, as appropriate. Site preparation shall include all support areas, staging areas, access routes/paths, and storage areas, as required.

2.4.1. Site Utilities and Permits. The Contractor shall be responsible for supplying all utilities, clearances, site offices and other equipment and incidentals thereto, that have not been previously coordinated. The Contractor shall also obtain all necessary permits (as applicable) and licenses required for this project. Although no specific permits are actually required for this facility, the substantive requirements shall be completed.

2.4.2. Equipment and Materials. The Contractor shall provide for all staging and storage of materials and equipment and coordinate in advance with the USACE on-site Construction Representative (CR) or Contracting Officer Representative (COR). The proposed locations shall be documented and approved in the Final Work Plans.

2.4.3. Surface Clearing. The Contractor shall perform the minimal amount of work necessary to clear the areas of vegetation, surface OE and OE scrap where these impede the progress, effectiveness or safety of the geophysical investigation. All OE related activities shall be performed in accordance to the approved work plans. The estimated quantity of surface preparation for Area 2 and Area 3 is approximately 380 acres. See Appendix B for additional clearing requirements.

2.4.4. Damaged Property. The Contractor shall immediately repair any damage incurred to the facility property and shall notify the USACE on-site Construction Representative (CR) and COR of the damages. Damages incurred as a result of Contractor negligence shall not be reimbursed. All damages incurred (whether negligent or not), how they were repaired, and any downtime or lost labor resulting from such loss shall be reported in writing to the COR within 24 hours of the incident.

2.5. Task V – Geophysical Test Plot. The Contractor shall test various geophysical methods, equipment, and personnel on geophysical test plots designed and established at the site, in order to determine the best suited methods and procedures. See Appendix B – Geophysical Investigation Requirements.

2.6. Task VI – Geophysical Investigation, Mapping and Evaluation. The contractor shall describe in the work plan all the elements required for geophysical investigation, mapping and evaluations, which shall include all personnel and associated equipment, materials, and miscellaneous items. The contractor shall also provide the estimated number of acres mapped each day and the type of documentation provided. See Appendix B for specific geophysical investigation requirements.

2.7. Task VII – Location Surveys and Mapping. The Contractor shall perform topographic and location/mapping surveys as described in the Work Plans. See Appendix B for specific requirements.

2.8. Task VIII - Site Security. The Contractor shall provide site security, as necessary, for any work activity accomplished in accordance to this Scope of Work. Requirements include labor, rentals, and other miscellaneous materials or fencing, including all installation costs, as required.

2.9. Task IX - Project Reporting. The Contractor shall prepare and submit a Draft Project Report documenting all field work and subsequent evaluations and recommendations within 6 weeks of completion of on-site work for this task order, unless otherwise determined by the USACE Project Manager. The reporting documentation shall be prepared following the requirements as specified in Data Item Description OE-030.01, Site Specific Final Report. Any OE surface materials collected and/or disposed, treatment, or monitoring completed as part of this task order shall be included in the report. The Final Project Report shall be completed and submitted within 21 days of receiving the Draft-Final Report comments.

2.10. Task X – Site/Field Support. The Contractor shall submit and document Project Field Support costs in detail. These project cost shall be tracked daily by the cost administrator and submitted weekly for review. The cost shall relate directly or indirectly to the project during its entirety. Field Project Support shall reveal any cost, which is not task specific (ie. supervisor, site safety officer, cost administrators). Site indirect cost shall also include all equipment or materials, which are not task specific.

2.10.1. Site Administration. The Contractor shall include all site administration costs as part of the site support cost. These costs include all labor, equipment and materials, which are required for site administration of the project. The Contractor shall describe in the Work Plan all elements required for site administration, including personnel and their functions, associated equipment, materials and incidental items. Site administration shall include submittals of weekly progress reports and applicable weekly cost reports with cost variance analysis.

2.11. Task XI - Project Support. The Contractor shall describe in the Work Plan all elements required for the proposed project support, which shall include all home office and management personnel and their functions, associated equipment, materials, and miscellaneous items required for the management of on-site activities.

2.11.1. Project Management. The Contractor shall designate a project manager for the duration of the project. The project manager shall be responsible for all project documentation and to coordinate all project requirements through the USACE Project Engineer. The project manager shall assure all reporting requirements are completed on schedule and in accordance with this scope of work.

2.11.2. Home Office Support. Home Office Support costs shall include all technical and administrative support necessary to effectively complete this delivery order. All home office support costs expended shall be documented in the weekly status reports. The weekly status reports shall also document any projected cost for the proceeding week or as required to complete project tasks.

2.12. Cost Proposal. The Contractor shall develop and submit the initial cost proposal within 2 weeks of receipt of this scope of work. The Contractor shall not be reimbursed for expenditures incurred during the Cost Proposal's preparation and negotiation. These task order costs shall be prepared based on this Scope of Work. The Cost Proposal shall provide a time-phased breakdown for each "TASK" based on Direct Costs including labor, equipment, materials, subcontracts, and indirect costs including overhead and G&A expenses. The applicable Wage Rates to be used for this project are contained in Appendix D. At a minimum, for subcontracts greater than $10,000, the Contractor shall provide three independent quotes and justification for selection.

3. Submittals. Documents submitted in performance of this Task Order shall be prepared on commercial grade bond paper. Documents shall be mailed via a carrier service that will provide overnight service, such as Express Mail, unless otherwise noted. The Contractor shall monitor one week prior to the submittal date for changes to the submittals with the U. S. Army Corps of Engineers Project Manager. The Contractor shall prepare and submit the following documents.

3.1. Draft Project Work Plans. Submit the following documents in accordance with the submittal register. All work plans shall be submitted as one document.

- **Geophysical Investigation Work Plans**
- **Site Safety and Health Plan (SSHP)**
- **Emergency Contingency Plan**
- **Site-Specific Advanced Agreements (SSAA)**

3.2. Final Project Work Plans. Upon conclusion of negotiations and review, the Contractor shall submit the Final Project Work Plans which shall incorporate all the above work plans, review comments, and any changes determined during the contract negotiations, within 5 days upon conclusion of negotiations, or as otherwise determined by the USACE Project Manager. Procedures for revisions are discussed in paragraph, "REVISIONS AND ADDENDA."

3.3. Daily Reports. The Contractor shall document daily reports including all field log's. All daily reports shall be available for electronic transmittal to the Omaha District Offices at the close of each business day. Daily reports shall be submitted on a weekly basis and included in the weekly status reports. Daily reports include the following:

- Rapid Response Quality Control Daily Report.

3.4. Weekly Status Report. The Contractor shall submit a weekly status report no later than 10:00 A.M. Eastern Standard Time the following Tuesday after the week being reported on. The reports shall be transmitted to the locations specified in the Submittal Register and then a hard copy of the report shall be sent via regular mail to the USACE Project Manager. The Weekly Status Report shall be transmitted weekly from delivery order award until demobilization. At that time, the report shall be transmitted bi-weekly or as determined by the USACE Project Manager, until final payment is made. The Weekly Status Report will include the following information:

- Project name.
- Date of report and reporting period.
- Name, title, telephone and fax numbers, address, and company name of the person completing the report.
- Summary of work performed for the project during the reporting period, both on site and off site.
- Explanation of any deviations from the scope of work and/or the Work Plan (including modifications and schedule changes).
- Discussion of all problems encountered.
- Recommendations.
- Key personnel changes.
- Work anticipated to be performed during the upcoming 2-weeks.
- Percent of field work complete and costs.
- Percent of project completed and costs expended.
- Conversation records with regulatory agencies.
- Tabulated waste handling information including samples taken, results, transportation plans, disposal facility, etc; if applicable.
- Submittal of Hazardous Waste Manifests, Waste Profile Sheets, and Land Disposal Restriction forms that were signed and submitted to the laboratories, disposal facilities or transporters during the week.
- Weekly - Rapid Response Work Order/Authorization.
- Submittal of all daily reports for the period being reported on.

3.5. Monthly Progress Reports. The Contractor shall prepare Monthly Progress Reports, as required by the Seneca Army Depot Facility.

3.6. Site Specific Final Report. Draft and Final copies of the Site Specific Project Report shall be submitted. While all submittals should be error-free, an extra effort shall be made to provide an error-free Final Project Report. The Final Site Specific Project Report shall be structured as stated in DID-OE-030.01 and include, but not limited to, the following sections:

- **Cover Page.**
- **Table of Contents.**

- **Executive Summary.**
- **Report Text.**
- **Appendices.**

3.7. Partial Submittals. Partial submittals will not be accepted unless prior approval is given.

3.8. Cover Letters. A cover letter should accompany each document and indicate the project, project phase, the date comments are due, to whom comments are to be submitted, the date and location of the review conference, etc., as appropriate. (Note that, depending on the recipient, not all letters will contain the same information.) The contents of the cover letters should be coordinated with the USACE-PE prior to the submittal date. The cover letter shall not be bound into the document.

3.8.1. Covers. The report covers shall be durable binders, which hold pages firmly while allowing easy removal, addition, or deletion of pages. A report title page shall identify the report title, the Corps of Engineers, the Environmental Protection Agency, Project Number, and date, etc.

3.9. Submittal Requirements. See Submittal Register, attached as Appendix E.

4. <u>Revisions and Addenda.</u> Review comments issued prior to Government approval shall be incorporated by revising and reissuing affected pages. If major revisions are necessary, the entire document shall be resubmitted. Minor changes affecting only a few pages may be made by addenda sheets. The affected pages shall have the revision number and date of correction on the bottom-right hand corner of the page.

4.1. Any changes to the project work plans shall be accompanied by a cover sheet with a list of pages that have been revised. The revised pages that the Contractor issues shall cover any additions or changes to the plans or reports. The addendum for the project plan shall be issued prior to the commencement of work for that phase.

5. <u>Project Management.</u> The Contractor shall assign an employee who will serve as the Project Manager (PM). This individual will oversee the coordination of the entire project, administer all instructions from authorized USACE personnel and obtain answers to all questions during and after the performance of work. The PM will be named by the Contractor and approved by the USACE in accordance with the Advance Agreement No. 8 - Key Personnel.

6. <u>Review of Progress and Technical Adequacy.</u> At any appropriate time, representatives of the Contracting Officer (CO) may review the progress and technical adequacy of the Contractor's work. Such review shall not relieve the Contractor from performing all contract requirements, except as may be waived by written instructions. The Contractor, under this contract, will interpose no objection or restriction to the Contracting Officer's designation of a Contractor for the purpose of reviewing the adequacy and corrections of the work performed under this contract.

7. <u>Meeting Minutes, Confirmation Notices and Annotated Comments.</u>

7.1. Meeting Minutes. The Contractor shall be responsible for taking notes and preparing the reports of all meetings and conferences, as required. Meeting minutes shall be prepared in typed form and the original furnished this office (within seven (7) work days after the date of meeting or conference) for concurrence and distribution to all attendees. This report shall include the following items as a minimum.

- The date and place the meeting or conference was held with a list of attendees. The list of attendees shall include at least the name, organization, and telephone number.
- Comments made during the meeting or conference, decisions affecting criteria changes must be recorded in the basic notes. Any augmentation of written comments shall be documented.

7.2. Confirmation Notices. The Contractor shall be required to provide a weekly record of all discussions, verbal directions, and telephone conversations participated in on all matters relative to this delivery order. These records, entitled "Confirmation Notices" shall be numbered sequentially and fully identify the participating personnel, subjects discussed and conclusions. The Contractor shall forward one reproducible copy of confirmation notices in each weekly status report.

7.3. Annotated Comments. Written comments presented by the reviewers of the project submittals shall be formally addressed and annotated by the Contractor. Annotated comment action shall be "A" for an Approved comment, "D" for a Disapproved comment, "W" for a comment that has been Withdrawn, and "E" for a comment that has an Exception noted. In addition, brief written responses to comments shall be added where appropriate. Annotated comments shall be submitted as an attachment to the cover letter transmitting the revised submittal or included as an appendix to the revised submittal.

8. <u>Applicable Publications.</u> This geophysical investigation shall be performed consistent with this Scope of Work and fully comply with the following guidelines and references, and in compliance with all applicable regulations and standards, including but not limited to, those listed below. In the case that these requirements are conflicting, the Contractor shall immediately notify the USACE Project Manager and implement the one which offers the greatest level of protection.

8.1. U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, issued 3 September 1996.

8.2. Occupational Health and Safety Requirements, Standard 29 CFR-1910 and Construction Industry Standards, 29 CFR-1926.

8.3. Applicable OE Regulations and Procedural Documents including Engineering Regulations, Pamphlets and Manuals that are listed on the USACE, Huntsville District, Ordnance and Explosives Mandatory Center of Expertise web page.

8.4. Applicable Data Item Descriptions (DID's) that are listed on the USACE, Huntsville District, Ordnance and Explosives Mandatory Center of Expertise web page. See attached Table 1 for a listing of the Data Item Descriptions.

8.5. Explosive Safety Submission (ESS), Ordnance and Explosives Removal at the Open Detonation (OD) Grounds, Seneca Army Depot Activity, September 2002, USACE.

9. <u>Attached Requirements.</u> All field, laboratory, and reporting requirements associated with this task order shall be completed in accordance with this Scope of Work (SOW) and the appendices attached hereto. If conflicts in specifications or methodology exist between the attached requirements, the Contractor shall immediately notify the USACE Project Engineer for clarification. Conflicts between this SOW and those desired by the Contractor shall be brought to the attention of the USACE Project Engineer for clarification and approval, prior to implementation.

Note: Applicable OE Regulations, Procedural Documents and Data Item Descriptions can be obtained at the Huntsville Center web page: http://www.hnd.usace.army.mil/oew/index.asp.

Table 1

Data Item Description Index

Old Number	Date	Title/New Title	New Number	Revision Date
OE-001	000303	Type I Work Plan/Type I (EE/CA) Work Plan	OE-001.01	021001
OE-010	000303	EE/CA Report	OE-010.01	021001
OE-005-01	000303	Type II Work Plan	OE-005-01.01	021001
OE-005-02	000303	Technical Management Plan	OE-005-02.01	021001
OE-005-03	990825	Explosives Management Plan	OE-005-03.01	021001
OE-005-04	000303	Explosives Siting Plan	OE-005-04.01	021001
OE-005-05	000303	Geophysical Investigation Plan	OE-005-05.01	021001
		Geophysical Prove-out (GPO) Plan and Report	OE-005-05A.01	
OE-005-06	000303	Site Safety and Health Plan	OE-005-06.01	021001
OE-005-07	000303	Location Surveys and Mapping Plan	OE-005-07.01	021001
OE-005-08	000303	Work, Data, and Cost Management Plan	OE-005-08.01	021001
OE-005-09	000303	Property Management Plan	OE-005-09.01	021001
OE-005-10	000303	Sampling and Analysis Plan/Environmental Sampling and Analysis Plan	OE-005-10.01	021001
OE-005-11	000303	Quality Control Plan	OE-005-11.01	021001
OE-005-12	000303	Environmental Protection Plan	OE-005-12.01	021001
OE-005-13	000303	Investigative Derived Waste Plan	OE-005-13.01	021001
OE-005-14	000320	Geographical Information System Plan	OE-005-14.01	021001
		Site Safety and Health Plan for Recovered Chemical Warfare Materiel (RCWM) Sites	OE-005-15.01	021001
		Interim Holding Facility Siting Plan for Recovered Chemical Warfare Materiel (RCWM) Projects	OE-005-16.01	021001
		Physical Security Plan for Recovered Chemical Warfare Materiel (RCWM) Project Sites	OE-005-17.01	021001
OE-015	000303	Accident/Incident Reports	OE-015.01	021001
OE-025	000303	Personnel/Work Standards	OE-025.01	021001
OE-030	000303	Site Specific Final Report	OE-030.01	021001
OE-040	000303	Disposal Feasibility Report	OE-040.01	021001
OE-045	000303	Report/Minutes, Record of Meetings	OE-045.01	021001
OE-055	000303	Telephone Conservation/ Correspondence Records	OE-055.01	021001
OE-060	000303	Conventional Explosives Safety Submission	OE-060.01	021001
		Recovered Chemical Warfare Materiel (RCWM) Conceptual Site Plan	OE-065.01	021001
		Recovered Chemical Warfare Materiel Safety Submission (CSS)	OE-070.01	021001
OE-080	000303	Monthly Status Report	OE-080.01	021001
OE-085	000303	Weekly Status Report/Project Status Report	OE-085.01	021001
OE-100	000303	Analysis of Institutional Controls/Institutional Analysis and Institutional Control Plan	OE-100.01	021001
		Recurring Review Plan	OE-110.01	021001

Appendix B

Geophysical Investigation Requirements

1.0 General Requirements

The Ordnance and Explosives EE/CA for the Seneca Army Depot recommends clearance to depth of detection for portions of the Open Detonation Area. Geophysical methods of mapping are required under this recommendation for the purpose of locating, marking, and creating a database of all potential OE/UXO and OE-related scrap at the Open Detonation Area. This information will be used to perform a removal action at a later date. This information will be also be used to refine the final acreage estimates for the different remedial zones as outlined in the EE/CA, and to provide an accurate cost estimate for the full-scale remediation. Significant intrusive work will not be required under this Scope of Work (SOW), however the Contractor may be required to process a limited number of subsurface anomalies. If intrusive type activities are performed, the Contractor shall provide UXO construction support, avoidance and surface clearance in accordance to applicable regulations and guidance. The Contractor's proposal shall detail the technical approach(s) that they will be using to meet the requirements of each task outlined below.

2.0 Project Document Review

The Contractor shall review all pertinent project data and documentation to familiarize project staff with the project and identify any data gaps in planning a work approach for this project.

3.0 Geophysical Prove-Out

A Geophysical Prove-Out (GPO) shall be used to demonstrate and evaluate the skill, ability, technique, procedures and equipment for geophysical mapping and evaluation as required in this SOW.. There are two primary Data Quality Objectives (DQOs) for this project: 1) to collect digital geophysical mapping (DGM) data that will be used to accurately estimate the cost of performing a removal action at this site and 2) to use the DGM data to produce anomaly selections (dig lists) that will be used during the removal phase, which will be performed at a later date and under a separate Scope of Work. Secondary DQOs, as they pertain to DGM data collection, are listed in Attachment 1 of this appendix. Additional secondary DQOs, as well as modifications to the secondary DQOs listed in Attachment 1, may be developed based upon the results of the GPO and shall be referenced in or included in the geophysical investigation work plan.

The field work shall include digital geophysical mapping of three non-contiguous prove out grids, which will be separated by at least 300 feet and up to 4000 feet. The prove-out grids will be established by the government, and each will not exceed 1 acre in size. A minimum of one survey control point located within 2 miles of the GPO sites will be

provided by the government. Up to five (5) geophysical mapping firms may perform a GPO in accordance with (IAW) DIDs OE-005-05A.01 and OE-005-05.01. The government reserves the right to evaluate the technical approaches submitted by the geophysical mapping firms that will be selected to demonstrate their abilities as part of this task.

Based upon the DQOs, the Contractor shall solicit a request for proposals (RFP) from geophysical mapping firms who can provide towed-array DGM services. The Contractor must obtain government approval of the language and content of the RFP prior to its being issued. The RFP shall state that respondents are to provide a detailed technical approach. This detailed technical approach will be used to evaluate the respondent and will serve as a work plan for performing a GPO should the respondent be selected to demonstrate their system and abilities at this site. All respondent's proposals to the RFP shall be provided to the government.

The Contractor shall submit (for approval) a Site Safety and Health Plan (SSHP) that will be used by all participants in this GPO. All selected firms shall perform their GPO at a time and date to be determined by the government. At present, it is anticipated that all firms will be on-site concurrently during the week of 21 April 2003. All selected firms will be allowed to arrive on-site on the Monday of the week selected to perform the GPO and will be given 2 days to prepare and setup their equipment. Individual staging areas can be provided upon request. The government will schedule the field work portions of the GPO to be performed from Wednesday through Friday.

Each firm shall submit the following deliverables within 5 business days following the completion of their GPO field work: 1) an abbreviated GPO letter report not to exceed 10 pages of written text (excluding figures and tables), 2) their final anomaly selection list, 3) their raw datasets, 4) their final processed datasets and 5) the proposed unit cost for full scale mapping efforts.

Following the submittal of these deliverables, the Contractor may reimburse the submitting firms a specified cost associated with mobilizing to the GPO, performing the GPO and demobilizing from the GPO. The compensation allowed shall be determined and specified in advance and shall be equally paid to each firm. The deliverables listed above, with the cost proposals submitted by each geophysical mapping firm shall be used to determine which firm or group of firms will perform the full-scale geophysical mapping/evaluation effort. The Government reserves the right to evaluate the final selection.

Following the selection of the firm or firms that will perform the DGM of the OD grounds, the Contractor shall prepare a GPO report detailing the type(s) of equipment and procedures that were tested and which were selected to provide accurate detection of buried ordnance items for the OD grounds removal action.. The Contractor shall submit a "Draft" and "Final" version of the GPO report. No field operations shall begin on the GPO plots or on the OD grounds until receiving Government approval. The Final GPO Report shall be included as an appendix to the Geophysical Investigation Work Plan.

4.0 Geophysical Investigation Work Plan

The Contractor shall prepare a detailed Geophysical Investigation Work Plan and sub-plans IAW DID OE-001.01 and associated DIDs for the work on this project. The final work plan shall include, either by reference or in the document, detailed explanations of operating procedures and processes that are based upon the methodologies demonstrated during the GPO. The registered Professional Engineer-In-Charge of the project shall sign all work plan submittals and seal the final work plan submittal. The registered Professional Engineer-In-Charge of the project shall be held directly responsible for the quality and completeness of the work plan submittals. The Contractor shall submit a "Draft", "Draft-Final" and "Final" version of the Work Plan.

5.0 Location Surveys and Mapping

The Contractor shall perform topographic and location surveys as described in the approved Geophysical Investigation Work Plan and in accordance with Corps of Engineers guidance contained in EM 1110-1-4009 and DID OE-005-07.01, Location Survey and Mapping Plan. A minimum of 5 (five) control monuments shall be established or identified for this site. Survey data may be submitted by CD or electronically via email and must be compatible with the GIS database. The site grid data shall include a map of the entire site showing grid locations and other pertinent features. A tabulated list shall be developed which identifies or numbers each grid and gives the state plane coordinates of grid corners. The list shall also include all network reference points used in performing all surveys. The Contractor shall furnish control cards for all benchmarks used during and established for the project. All grid corners shall be marked with a wooden stake with flagging or an approved marking technique. Survey locations shall be listed in state plane coordinates and the data submitted in Microsoft Excel 2000 or other digital format approved by the Contracting Officer (CO). All survey data shall be included in the Investigation Report and entered in the GIS database.

6.0 Establishment and Management of GIS

The Contractor shall use the Corps of Engineers OE GIS model, or other model as approved by the CO, and apply it to this project. The model shall be used, as a starting point to load data and create a project-specific GIS tailored for the specific OE investigative needs of this site. Further guidance can be found in EM 1110-1-4009 and DID OE-005-14.01, Geophysical Information System Plan. Spatial data, to include raster and vector data, shall be geo-referenced to the project specific coordinate system. Raster data shall be in TIF format with accompanying world reference files. Tabular data shall be provided in a Microsoft Access 2000 compatible format. All changes from the model shall be fully documented into a manual specifically tailored for this project. The Contractor shall submit a CD with all GIS data and updates with each monthly report. The Contractor shall provide a secure website for all project-related submittals and project correspondence. A password shall be required and shall be coordinated through

the Corps of Engineers by the Contractor. All data generated on this project shall be incorporated into a GIS database.

7.0 Brush Clearing

The Contractor shall perform the minimum amount of work necessary to clear paths or areas of vegetation which impede the progress, effectiveness or safety of the geophysical mapping team or affects the data quality. Brush-clearing requirements, procedures, and restrictions shall be evaluated and refined during the pre-proposal site visit. In the non-forested areas, all brush and trees over 6-inches in diameter shall be removed. All forested areas shall remain intact unless the Contracting Officers Representative authorizes removal. For planning purposes, the Contractor shall assume 275 acres of brush clearing based on an approximate total of 380 acres to be investigated. The Contractor shall provide to the PM and COR the total brush clearing cost and the associated unit price based on acreage cleared per day. The brush clearing acreage may be increased or decreased based upon project requirements. Pre-negotiated unit prices will be used for all quantity changes.

8.0 Geophysical Mapping and Evaluation

The Contractor shall implement geophysical mapping and evaluation as described in the approved Geophysical Investigation Work Plan and DID OE-005-05.01. All geophysical mapping teams shall be established from personnel who have successfully demonstrated their ability by training on the prove-out plot for skill, ability, technique and procedure. The Contractor's lead geophysicist for the project shall identify and document the composition of the project geophysical team(s) and document the proven skill, ability, and training of any new member. The lead geophysicist is responsible for the quality and performance of work from each member of the geophysical team.

Small individual pieces of OE scrap and other metallic scrap that would not likely mask a subsurface anomaly may be left in place but must be documented and incorporated into the GIS database. Large individual items of OE scrap or other metallic scrap that could potentially mask any subsurface anomalies shall be removed. All trash pits or other concentrations of metallic surface scrap shall be left undisturbed and their boundaries surveyed and incorporated into the GIS database. All surface UXO or OE that pose a safety hazard shall be collected, documented, and properly disposed of from the geophysical mapping paths or areas. The Contractor shall be prepared to perform demolition operations on a daily/weekly basis as needed.

All OE-related activities shall be performed in accordance with applicable sections of the approved Geophysical Investigation Work Plan. For planning purposes, the Contractor shall plan on investigating 275 acres using conventional digital geophysical mapping (DGM) techniques. The Contractor shall plan on investigating the remaining 105 acres (estimated) of heavily forested areas and hedge-rows using "mag & flag" techniques along transects that are 10 feet wide and spaced every 50 feet. The Contractor shall also use "mag & flag" techniques to re-investigate 5 acres of the area geophysically mapped

using digital techniques in order to correlate the mag and flag anomaly data in heavily wooded areas to data collected using DGM techniques. The actual locations of areas making up the 5 acres shall be agreed upon between the Contractor and the Government following the collection of DGM data in areas bordering the wooded portions of the site. For estimating purposes, the Contractor shall plan on investigating a total of 26 acres by mag and flag techniques. The Contractor shall provide a total geophysical mapping cost and the associated unit price per acre for both their DGM method and their mag and flag method. The Government reserves the right to increase or decrease the total investigated acreage.

8.1 Geophysical Mapping

Conventional OE investigations using digital geophysical mapping techniques shall employ a grid pattern using a 125' X 125' grid. The number, size, and location of grids may change based upon conditions encountered in the field and must be coordinated through a Corp of Engineers representative. Once final determination is made, the actual total acreage shall not increase or decrease without written approval from the Contracting Officer Representative. The smallest OE ferrous item expected is a 20 mm projectile, however all metal objects must be identified in a grid. Clearance depth is 4 feet. The Contractor shall perform Quality Control (QC) on the geophysical mapping and evaluation following the schedule in Attachment B of DID OE-005-05.01 and by placing known items on the ground surface at locations that are known to within +/-1foot. The frequency of QC items shall be one (1) per data set or one per 5 acres of contiguously surveyed area. A QC failure shall result if the Contractor does not detect this item during the geophysical mapping and evaluation. The Government reserves the right to conduct Quality Assurance (QA) on the geophysical mapping by placing known items underneath the ground surface which are blind to the Contractor at the same frequency as the QC. A QA failure shall result if the Contractor does not detect this item during the geophysical mapping and evaluation. The data gathered from the surface clearance for the geophysical mapping process shall be entered into the GIS database and the final report.

The Contractor's proposal shall include an estimate of the sum of errors in positioning for the approach(s) they will be using under this task order. If the sum of errors for the positioning of data exceeds the project defined DQOs for a given data set and the justification for such is not acceptable to the Government, all affected data will be recollected at no cost to the Government. If any changes/replacements are made to the geophysical mapping equipment or navigation equipment, the equipment shall be tested on the GPO and reviewed and accepted by the Project Geophysicist.

8.2 Evaluation

The Contractor's proposal shall identify the roles and functions of the personnel that will be performing data evaluation. The Contractor shall include in their proposal any costs associated with all additional or advanced processing that may be required. A letter signed by the Project Geophysicist shall accompany every data submittal verifying the quality of the data. The geophysicist shall make a professional determination regarding

the identification of target anomalies at the site that meet the established selection criteria.

8.3 Anomaly Selection

The Contractor shall document the methodology and criteria for identifying and evaluating anomalies in the approved Geophysical Investigation Work Plan. The methodology and criteria will be based upon project specific data quality objectives and will be agreed upon by the project team. . The dig sheet shall identify the Contractor's QC target anomalies as described in the QC plan. The Governmentreserves the right to select up to an average of two anomalies/acre to be reacquired by the Contractor for Quality Assurance (QA). A QA failure shall result if a selected anomaly can not be reacquired by the Contractor, the government or a government's representative.

8.4 Quality Control and Quality Assurance

The Contractor shall immediately notify the Contracting Officer of any detected QC failure. For any QC failure or QA failure, the Contractor shall perform a root-cause analysis and determine the extent of previously performed work that may be affected by the failure. Following the root-cause analysis the Contractor shall implement corrective actions. If the corrective actions can not remedy the QC failure or QA failure to the extent that the affected data will meet project DQOs, then the Contractor shall resurvey all affected areas at no cost to the Government.

8.5 Anomaly Reacquisition and Marking

As part of the government's QA process, the Contractor shall reacquire selected geophysical target anomalies as identified on the dig sheet. The anomalies to be reacquired shall be identified by the government and the reacquisition shall be coordinated between the Contractor and the Government such that this activity minimally impacts the Contractor's schedule. The Contractor's reacquisition methodology shall confirm and document that the selected anomalies in the dig sheets have been reacquired. Any anomalies where the reacquisition is ambiguous or uncertain shall be flagged as such. The Contractor shall provide a total anomaly reacquisition cost based upon 2 anomalies/acre and a unit cost per anomaly.

ATTACHMENT 1

DQOs for Digital Geophysical Mapping at the OD Grounds

Seneca Army Depot Activity

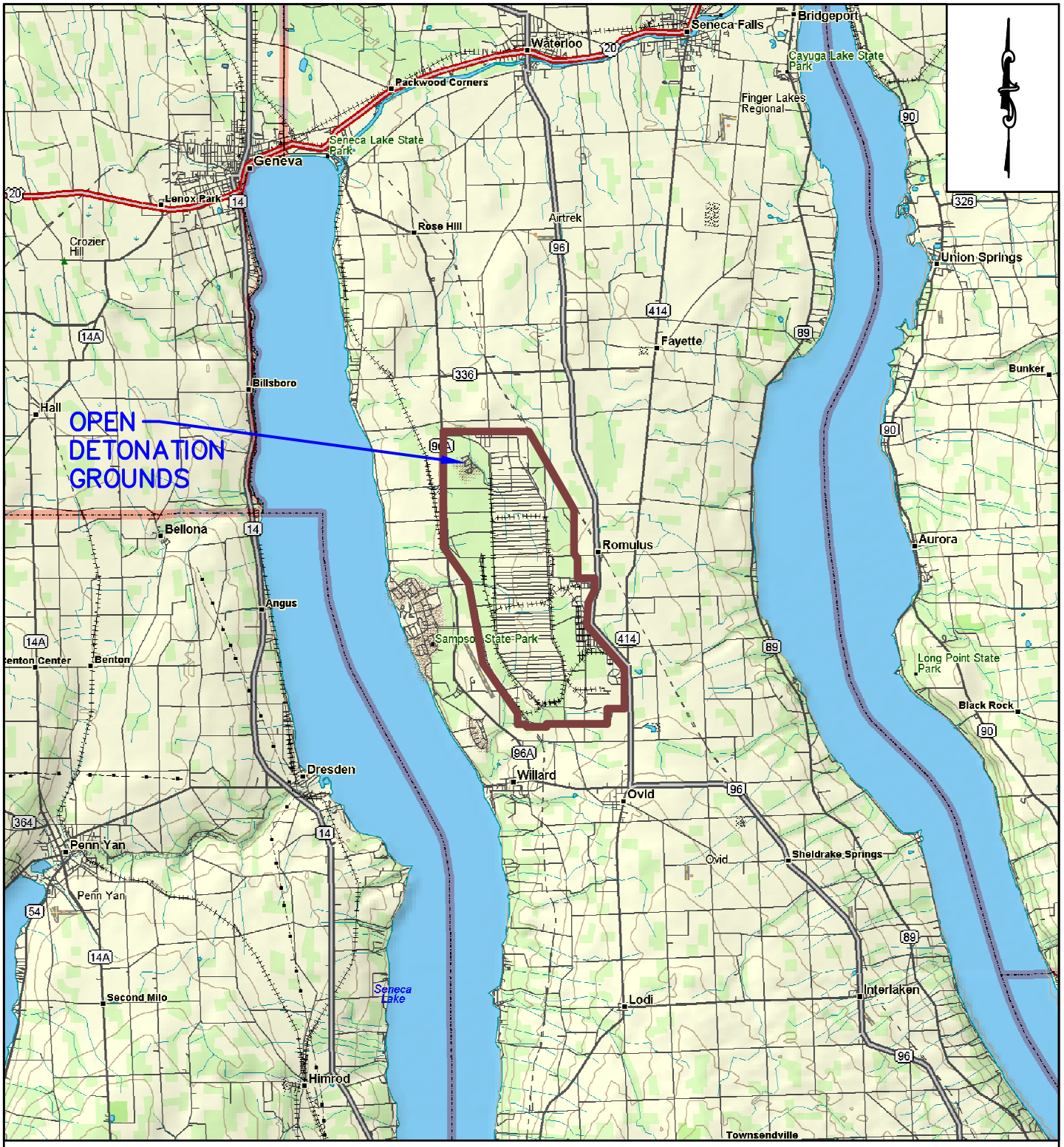
- All DQOs stated in the Scope of Work.
- All DQOs stated in DIDs that are referenced in the Scope of Work.
- Instrument Latency DQO: Instrument latency will be corrected using an appropriate correction routine that accounts for instrument latency time and sensor velocity. Corrections must be specific for all segments of data with equal sensor velocities. The DQO statement for latency corrections should be "No "zig-zag" or "chevron" effects are visible in the data maps when plotted at the scales used to detect the smallest amplitude signal for any given UXO item expected at this site". Simple "lag" corrections or "offset" corrections that use a single correction parameter for an entire dataset are not likely to meet this DQO when the sensor velocity is not constant.
- Magnetic heading and diurnal effects DQO. The DQO statement for heading corrections should be "No 'striping' is visible in vertical gradient data above a 0.2 nT/ft level between lines and no 'striping' is visible in total field data above a 1 nT/ft level between lines." The DQO statement for diurnal base station data should be "The base station data exhibits normal characteristics for such data (background variations of less than 1nt (typical) between measurements during periods without magnetic storms), and does not show indications of interference from cultural sources."
- EM leveling DQO statement: For any given dataset of EM data, all data channels will be leveled using the same routines and the same parameters.
- Processing DQO statement: All processing performed to produce final datasets (including processing to level the data and to remove heading and diurnal effects) will be evaluated, on a dataset by dataset basis, to confirm that those routines do not significantly alter the original measured peak responses (above background) over anomalies. For producing final EM61 datasets, processing routines shall not alter the peak responses of anomalies by more than the lesser of 5% or 5mV. For producing final magnetic datasets, the processing routines shall not alter the original measured peak responses over anomalies by more than the lesser of 5% or 10nT for total field magnetic data or more than the lesser of 5% or 5nT/ft for vertical gradient magnetic data. This DQO does not apply to any advanced processing that is performed on final datasets, including advanced processing that may be performed as part of anomaly selection processes.
- Sampling density DQOs:
    - Along-track sampling densities do not exceed 0.5 feet for EM data and do not exceed 0.5 feet for magnetometer data.

    - For EM data, the across-track line spacing does not exceed 3 feet or the across-track width of the sensor, whichever is smaller. For magnetometer data, the across-track line spacing does not exceed 2 feet or one-half the diameter of the smallest signal footprint from an OE item, whichever is smaller.

- Anomaly selection DQO statement: The senior geophysicist or one of his/her designates will certify that all anomaly selections have been performed or reviewed by them and that they accept the anomaly selections as reasonable for the intended purpose of this project.
- Navigation DQO: The sum of all data positioning errors in the final datasets will not exceed +/- 1 foot. This DQO is specific to the reported positions of the state-plane coordinates for each data point in the final version of geophysical data. This DQO does not include the accuracy of reported coordinates for selected anomalies. The purpose of this DQO is to ensure that proper field procedures are developed and used to minimize navigation errors and to identify any errors early in the event they occur. Typical sources of navigation errors include inaccuracies in placing survey markers (e.g. grid corners and transect markers), the underlying assumptions of the merging processes used to merge navigation data with DGM data, inaccuracies associated with latency, inaccuracies associated with offset correction assumptions, and inaccuracies in dead-reckoning (the ability of the operator to maintain a straight line between survey markers, which is typically +/- 0.5 foot over 50-foot segments).

APPENDIX B

SITE PLANS, SCHEDULES, AND CHARTS



SOURCE:
USGS TOPOGRAPHY MAPS; GENEVA SOUTH, DRESDEN, OVID, & ROMULUS – NEW YORK QUADS

GRAPHIC SCALE
3 1.5 0 1.5 3
APPROXIMATE SCALE IN MILES

TIME SENSITIVE GEOPHYSICAL INVESTIGATION
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

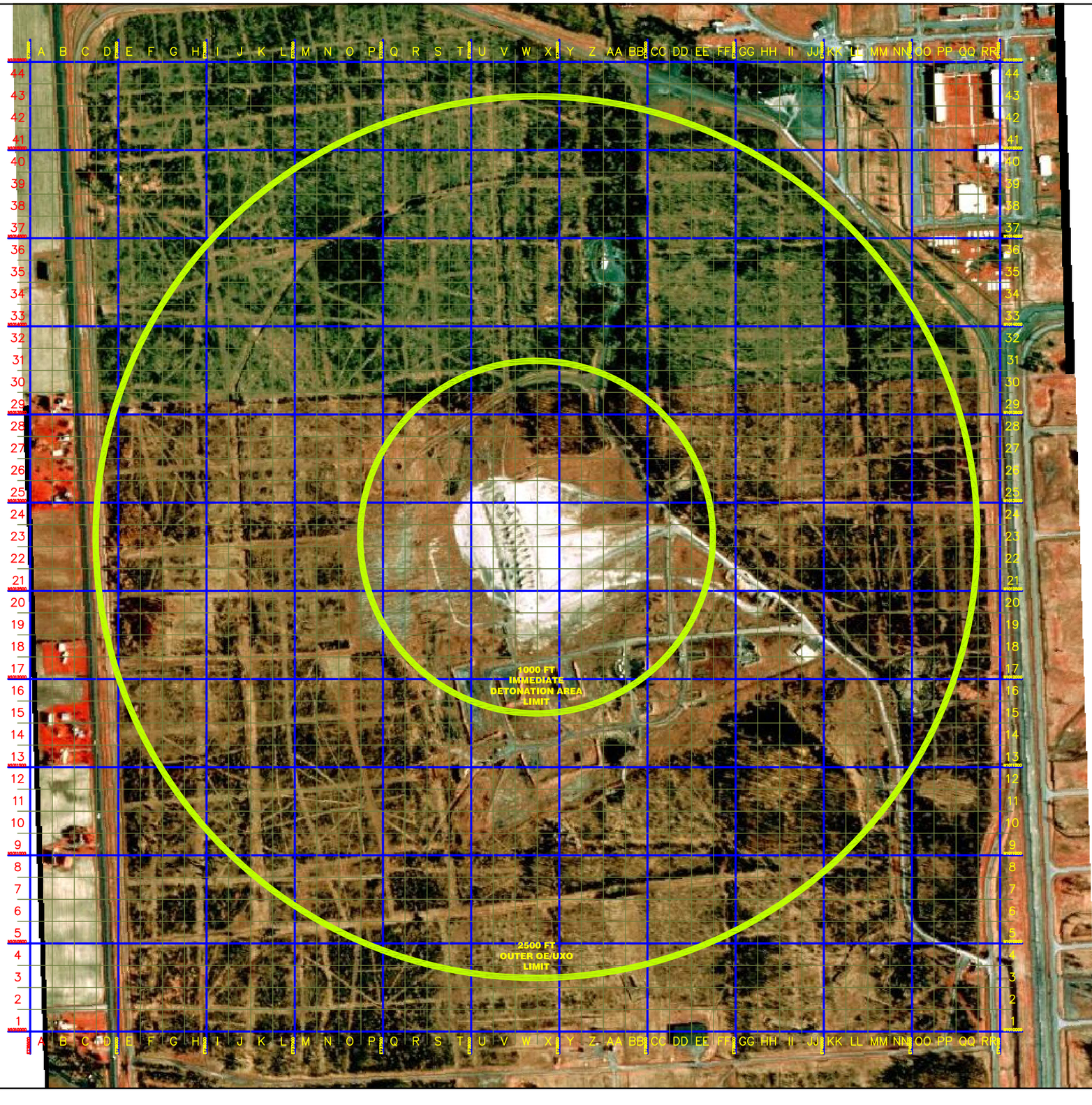
DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

SITE LOCATION MAP

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DRAWN	BEG
DATE	MAY 2003
FIGURE NO.	1–1

M:\Design\DWG\ACOE\SENECA\OD GROUNDS\WORK PLAN\LOCUS.dwg, Layout1, 05/02/2003 08:42:48 AM, girardeb, 1:1



GRAPHIC SCALE

500 250 0 250 500

APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

TIME SENSITIVE GEOPHYSICAL INVESTIGATION
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

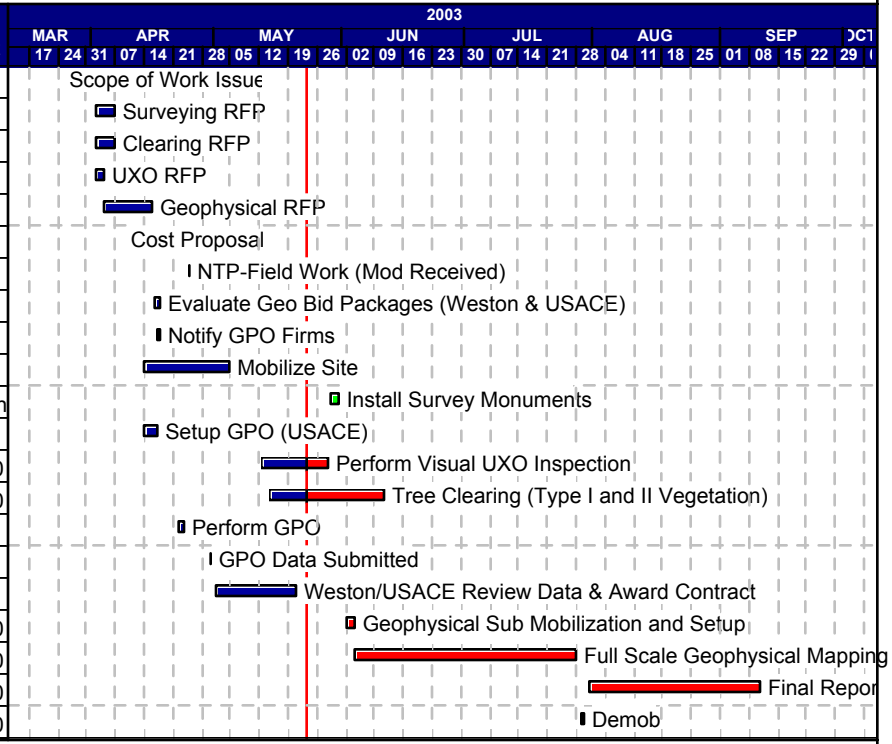
OPEN DETONATION GROUNDS

DRAWN	DATE	FIGURE NO.
BEG	MAY 2003	1–2
CHECKED	W.O. NO.	

M:\Design\DWG\ACOE\SENECA\OD GROUNDS\WORK PLAN\SITE MAP.dwg, 11x17, 05/02/2003 08:47:49 AM, girardeb, 1:1

Geophysical Investigation
Open Detonation Grounds
at
Seneca Army Depot Activity, Romulus, NY

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float
950	Scope of Work Issued	1d	0	25MAR03 A	25MAR03 A	
1000	Surveying RFP	3d	0	02APR03 A	07APR03 A	
1010	Clearing RFP	4d	0	02APR03 A	07APR03 A	
1020	UXO RFP	3d	0	02APR03 A	04APR03 A	
1030	Geophysical RFP	6d	0	04APR03 A	16APR03 A	
1040	Cost Proposal	1d	0	09APR03 A	09APR03 A	
1050	NTP-Field Work (Mod Received)	1d	0	25APR03 A	25APR03 A	
1060	Evaluate Geo Bid Packages (Weston & USACE)	2d	0	16APR03 A	18APR03 A	
1070	Notify GPO Firms	1d	0	17APR03 A	18APR03 A	
1080	Mobilize Site	1d	0	14APR03 A	05MAY03 A	
1090	Install Survey Monuments	3d	3d	29MAY03	31MAY03	632h
1100	Setup GPO (USACE)	5d	0	14APR03 A	17APR03 A	
1110	Perform Visual UXO Inspection	12d	5d	12MAY03 A	29MAY03	0
1120	Tree Clearing (Type I and II Vegetation)	24d	16d	14MAY03 A	11JUN03	0
1130	Perform GPO	3d	0	22APR03 A	24APR03 A	
1140	GPO Data Submitted	1d	0	30APR03 A	30APR03 A	
1150	Weston/USACE Review Data & Award Contract	3d	0	01MAY03 A	21MAY03 A	
1155	Geophysical Sub Mobilization and Setup	3d	3d	02JUN03	04JUN03	0
1160	Full Scale Geophysical Mapping	45d	45d	04JUN03	28JUL03	0
1170	Final Report Submitted to USACE	30d	30d	31JUL03	11SEP03	0
1180	Demob	2d	2d	29JUL03	30JUL03	0



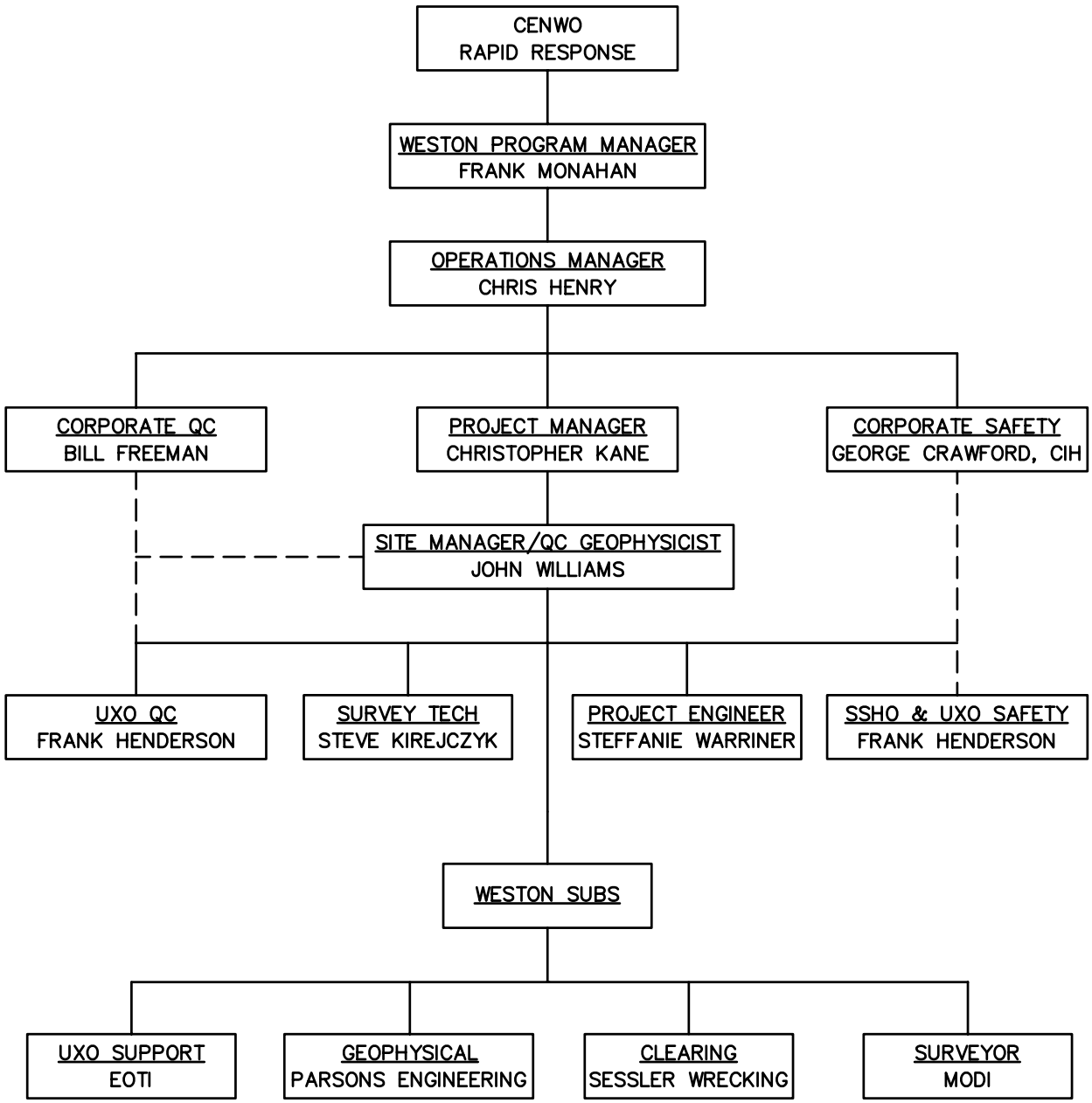
Start date	19MAR03
Finish date	11SEP03
Data date	23MAY03
Run date	28MAY03
Page number	1A

Figure 2-1
Prepared by Weston Solutions, Inc.
for
U.S. Army Corps of Engineers

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

ORGANIZATIONAL CHART

OPEN DETONATION GROUNDS – GEOPHYSICAL INVESTIGATION
SENECA ARMY DEPOT
ROMULUS, NEW YORK



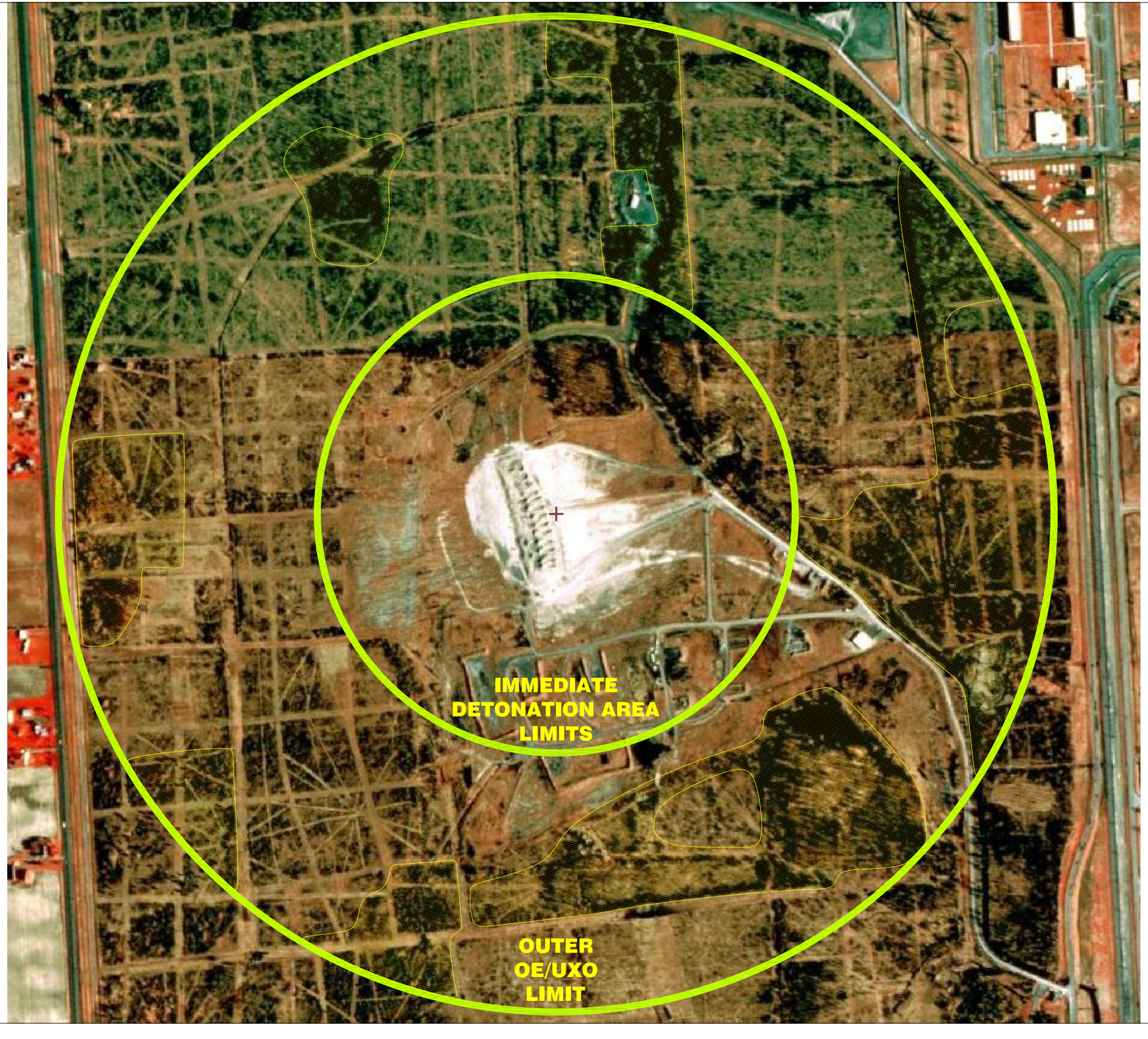
TIME SENSITIVE GEOPHYSICAL INVESTIGATION
SENECA ARMY DEPOT ACTIVITY (SEDA)
ROMULUS, NEW YORK

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTTS AFB, NEBRASKA

ORGANIZATIONAL CHART

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DRAWN	BEG
DATE	MAY 2003
FIGURE NO.	2-2



GRAPHIC SCALE

500 250 0 250 500

APPROXIMATE SCALE IN FEET

LEGEND

TYPE 2 DENSE TREE COVER

NOTE:
ALL OTHER AREAS CONSIST MAINLY OF LIGHT GRUSH AND LIGHT TO MODERATE TREE COVER.

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

OPEN DETONATION GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

CLEARING PLAN

DRAWN	DATE	FIGURE NO.
BEG	MAR 2003	2-3
CHECKED	W.O. NO.	

M:\Design\DWG\ACOE\SENECA\OD GROUNDS\CLEARING PLAN.dwg, 11x17, 05/02/2003 03:50:59 PM, baronal, 1:1

APPENDIX C

LOCAL POINTS OF CONTACT

POINTS OF CONTACT

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U. S. Army Engineering and Support Center
Huntsville, AL
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APPENDIX D

SITE SAFETY AND HEALTH PLAN

U.S. Army Corps of Engineers

Omaha District
Offutt AFB, Nebraska

SENECA ARMY DEPOT ACTIVITY
TIME SENSITIVE GEOPHYSICAL INVESTIGATION
OPEN DETONATION GROUNDS
SENECA COUNTY
ROMULUS, NEW YORK

Contract No. DACA45-98-D-0004
Task Order No. 0037

FINAL
SITE SAFETY AND HEALTH PLAN

May 2003

01M-0007

WESTON SOLUTIONS
Restoring Resource Efficiency

FINAL

SENECA ARMY DEPOT
SITE SAFETY AND HEALTH PLAN
TIME SENSITIVE GEOPHYSICAL INVESTIGATION
OPEN DETONATION GROUNDS
SENECA COUNTY
ROMULUS, NEW YORK

Contract No. DACA45-98-D-0004
Task Order No. 0037

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
Castle Hall Building No. 525,
3rd Floor
Offutt AFB, Nebraska

Prepared by:

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May 2003

W.O. No. 20074.515.037

Site Safety and Health Plan
Approval/Signoff Form
Open Detonation Grounds
Seneca Army Depot Activity
Romulus, NY

Contract No. DACA45-98-D-0004

SITE SAFETY AND HEALTH PLAN APPROVALS

By their specific signature, the undersigned certify that this Site Safety and Health Plan is approved for utilization during Time Sensitive Geophysical Investigations at the Open Detonation Grounds located at the Seneca Army Depot in Romulus, New York.

Signature, Name, Title

WESTON – Operations Manager
Christopher Henry — Date: 5/30/03

WESTON - Project Manager
Christopher G. Kane — Date: 5/30/03

WESTON - Program CIH
George M. Crawford, CIH — Date: 5/30/03

WESTON - Site Safety and Health Officer
Frank Henderson — Date: May 30, 2003

Site Safety and Health Plan
Approval/Signoff Form
Open Detonation Grounds
Seneca Army Depot Activity
Romulus, NY

Contract No. DACA45-98-D-0004

I understand, agree to, and will abide by the information set forth in this Site Safety and Health Plan, and the information discussed in the Daily Safety and Health briefings.

Name	Signature	Date
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Site Safety and Health Plan
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Romulus, NY

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Name	Signature	Date

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS
(continued)

Section **Page**

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
BIP	blown-in-place
BRAC	Base Realignment and Closure
CIH	Certified Industrial Hygienist
EE/CA	Engineering Evaluation/Cost Analysis
ERCP	Emergency Response Contingency Plan
ESS	Explosive Safety Submission
FLD	Field Operating Procedure
ft	feet
GPO	Geophysical Prove-Out
GPS	Global Positioning System
mm	millimeter
MPM	most probable munitions
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
ODG	Open Detonation Grounds
OE	Ordnance and Explosives
ORS	Ordnance-Related Scrap
OSHA	Occupational Safety and Health Administration
PE	Project Engineer
PM	Project Manager
PPE	Personal Protective Equipment
PSO	Program Safety Officer
QC	Quality Control
SEDA	Seneca Army Depot Activity
SOW	scope of work
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TLVs	threshold limit values
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
$WESTON_{SM}$	Weston Solutions, Inc.
WP	Work Plan

SECTION 1

INTRODUCTION

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

Weston Solutions, Inc. (WESTON$_{SM}$) has prepared this Site Safety and Health Plan (SSHP) for geophysical investigation and mapping work to be conducted at the Open Detonation Grounds (ODG) within the Seneca Army Depot Activity (SEDA) located in Romulus, Seneca County, New York. This work will be performed for the U.S. Army Corps of Engineers (USACE) as part of the Rapid Response/Immediate Response Contract for Control/Remediation of Hazardous, Toxic, and Radioactive Waste, Contract No. DACA45-98-D-0004, Task Order No. 0037.

The primary objectives for this scope of work (SOW) [as specified in the Work Plan (WP)] include the following:

- To identify all target Unexploded Ordnance (UXO)/Ordnance and Explosives (OE) and/or ordnance-related scrap (ORS) between the inner and outer radial limits of the ODG site.
- Acquire comprehensive mapping and target data for planning, cost estimating, and for executing the OE removal.

Fieldwork under this task order shall include the following:

- Mobilization of construction equipment and personnel to the project site for clearing and geophysical activities.
- Site preparation including installation of drainage and erosion control measures as necessary, and site surveying to delineate work areas, confirm existing control points, install five new benchmark monuments, mark the inner and outer ODG radii, and establish site clearing limits.
- Site clearing including removal of brush and vegetation less than six inches in diameter.
- Geophysical Prove-Out (GPO) and Full-Scale Geophysical Mapping
- Unexploded Ordnance avoidance support including surface inspection and removal and destruction of any OE/UXO prior to and during clearing and geophysical site work.
- Demobilization of equipment and personnel.

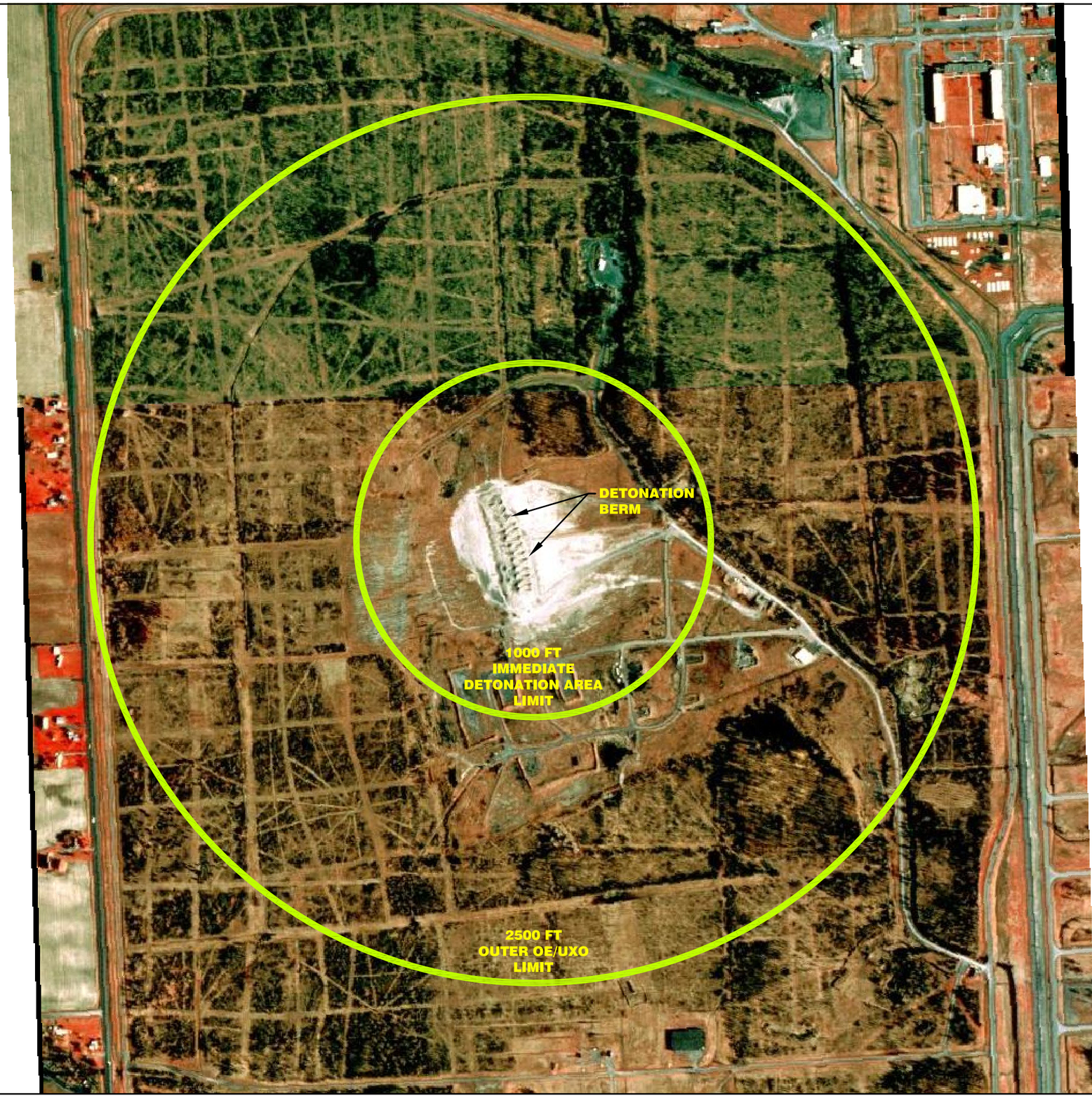
1.2 SITE LOCATION AND DESCRIPTION

The Seneca Army Depot Activity is located in Romulus, Seneca County, New York (see Figure 1-1). It is a United States Army facility that occupies approximately 10,600 acres bounded to the west by State Route 96A, and to the east by State Route 96. Geneva and Rochester are located to the northwest (14 and 50 miles, respectively), Syracuse is 50 miles to the northeast, and Ithaca is 31 miles to the south. The surrounding area is generally used for agriculture.

The ODG site (shown in Figure 1-1) consists of an open area that is approximately 60 acres in size and surrounds a large berm that was formerly used to suppress the effects of detonation activities. This 60-acre area represents the immediate area surrounding the ODG berm. However, a total area of 450 acres may have been impacted as a result of the detonation operations performed at ODG. Aerial photographs from 1954 show there may also have been burn pads located in this area; however, more recent photographs indicate that these were buried by 1978. A variety of ordnance items were detonated in this area including, explosives, rockets, and heavy artillery. The blast radius shown on archived drawings is approximately 1,800 feet (ft) from the center of the demolition berm. It is anticipated that OE/UXO and ORS are prevalent throughout this area. However, a maximum radius of 2,500 ft has been established to identify all possible anomalies associated with the former ODG operations.

1.2.1 Site Background

The SEDA was included on the Federal Facilities National Priorities List in July 1989 and was officially closed in July 2000 under the Department of Defense's Base Realignment and Closure (BRAC) process. Prior to closure, historical operations at the ODG site resulted in ordnance and munitions debris scattered throughout the ODG over an area that is approximately 450 acres in size.



GRAPHIC SCALE

500 250 0 250 500

APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

OPEN DETONATION GROUNDS
SENECA army DEPOT ACTIVITY
ROMULUS, NEW YORK

SITE PLAN

DRAWN	DATE	FIGURE NO.
BEG	APR 2003	1–1
CHECKED	W.O. NO. 20074 515 037	

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1.3 REGULATIONS AND GUIDELINES

To ensure the safety and health of on-site personnel, visitors, client personnel, and the local community, the geophysical investigation shall be performed in full compliance with all local, state, and federal regulations and guidelines, including but not limited to, the following:

- U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 dated 3 September 1996.
- Occupational Health and Safety Requirements, Standard 29 CFR-1910 and Construction Industry Standards, 29 CFR-1926.
- Applicable OE Regulations and Procedural Documents including Engineering Regulations, Pamphlets, and Manuals that are listed on the USACE, Huntsville District, Ordnance and Explosives Mandatory Center of Expertise website (http://www.hnd.usace.army.mil/oew/index.asp).
- Applicable Data Item Description requirements that are listed in Table 1 of the SOW (refer to Appendix A of the WP), and can also be found at the Huntsville Center website address shown above.
- Explosive Safety Submission (ESS), Ordnance and Explosives Removal at the ODG, Seneca Army Depot Activity, September 2002, USACE.

SECTION 2

PERSONNEL AND RESPONSIBILITIES

2. PERSONNEL AND RESPONSIBILITIES

All operations and personnel having the potential for exposure to site hazards are subject to the requirements of this SSHP. Work shall not be performed in a manner that conflicts with safety, health, or environmental precautions outlined in this plan. All site personnel, including WESTON subcontractors, who have the potential for exposure to site hazards, are subject to the requirements of this SSHP. Personnel violating safety procedures are subject to dismissal/removal from the project site. Roles and responsibilities for site personnel are summarized in the following subsections. An organizational chart depicting the chain of command for this project is presented in Section 2 (Mobilization and Site Preparation) of the WP.

2.1 PROGRAM OPERATIONS MANAGER

Mr. Chris Henry serves as WESTON's Program Operations Manager for all Rapid Response task orders. Mr. Henry is responsible for ensuring that WESTON executes all task orders efficiently, expediently, and with the highest degree of competency. He provides support to the Project Manager (PM) with regards to purchasing, soliciting of vendors, and evaluation of bids for consent packages, property management, home office administrative and technical operations, and final voucher processing to USACE. Mr. Henry also assists with program level issues relating to the specific delivery order. Mr. Henry reports directly to Mr. Frank Monahan who is the Rapid Response Program Manager.

2.2 PROJECT MANAGER

Mr. Chris Kane will serve as the PM for the activities covered under this task order. He has overall responsibility for the management and completion of the project, which includes: resource allocation, financial reporting, schedule control; review and approval of deliverables.

2.3 SITE MANAGER/QUALITY CONTROL GEOPHYSICIST

Mr. John Williams will serve as the Site Manager/Quality Control (QC) Geophysicist for this project. He will be responsible for coordinating and supervising all site activities, which include, but are not limited to, the following:

- Supervision of WESTON and WESTON subcontractor personnel.
- Submission of daily reports, QC data, and subcontractor reports.
- Compliance with all QC measures as described in the WP.

2.4 PROGRAM SAFETY OFFICER

The Program Safety Officer (PSO) for this project is Mr. George M. Crawford, Certified Industrial Hygienist (CIH). Mr. Crawford is certified in comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene. He has over 20 years of industrial hygiene and safety experience. The PSO has the following responsibilities:

- Review and final approval of the SSHP.
- Ensure that the SSHP complies with all federal, state, and local health and safety requirements.
- If necessary, modify specific aspects of the SSHP to adjust for on-site changes that affect safety.
- Evaluate and authorize any changes to the SSHP.
- Implementation and oversight of the Health and Safety Program.
- Assist in acting as liaison with government officials regarding health and safety-related site matters.
- Maintain frequent communication with the Site Safety and Health Officer (SSHO) regarding site activities and implementation of the SSHP.
- Assist in training site personnel in the site-specific hazards.
- Ensure that both the site and site personnel comply with the WESTON Safety Program and all other applicable plans.

2.5 SITE SAFETY AND HEALTH OFFICER/UNEXPLODED ORDNANCE SAFETY AND QUALITY CONTROL OFFICER

Mr. Frank Henderson will serve as the SSHO for this project. He will be responsible for implementing the SSHP and ensuring that all project personnel follow the requirements of the SSHP. In addition to overall site safety, he will also be responsible for enforcing the UXO Safety as it applies to UXO avoidance support activities detailed in Section 3 (Site Characterization) of this document.

The SSHO will be responsible for conducting morning safety meetings for all site personnel to discuss the day's activities, associated hazards, and UXO safety. He will also be required to report any incidents that occur on- site to the Site Manager, PM, Program Manager, and PSO. He will be required to implement safety corrective actions through training and reinforced awareness.

2.6 PROJECT ENGINEER

Ms. Steffanie Warriner will support the PM and field staff as Project Engineer (PE). She will report directly to the PM and will ensure that all project deliverables, schedule objectives, and subcontractor responsibilities are maintained in accordance with project requirements.

2.7 SURVEY TECHNICIAN

Mr. Stephen Kirejczyk will support the field team by providing survey and Global Positioning System (GPS) support. He will report to the Site Manager and will be responsible for delineating work areas for clearing and geophysical activities, establishing grid coordinates (where necessary), and for documenting progress in the field.

2.8 CORE FIELD TEAM

A WESTON Core Field Team will assist the Site Manager with managing daily progress, technical issues, coordinating subcontractors and vendors, resolving issues associated with the project. The Core Field Team will include at a minimum, the Site Manager, SSHO/QC Officer,

and PE. A survey technician will assist in tracking field progress, but is also a SSHO and will assist Mr. Henderson in fulfilling his responsibilities.

2.9 WESTON SUBCONTRACTORS

Qualified subcontractors including, but limited to, those listed below will be brought on-site for specialty services:

- Sessler Wrecking (brush clearing)
- Parsons Engineering (geophysical)
- EOTI (UXO avoidance inspection)
- MODI (surveying)

These subcontractors will be under the ultimate direction of the Site Manager and are required to adhere to all aspects of the SSHP.

SECTION 3

SITE CHARACTERIZATION

3. SITE CHARACTERIZATION

The SEDA ODG has a UXO hazard associated with it due to historic activities that included detonation of a variety of ordnance. Consequently, there is a possibility that UXO/OE may be found during site work within the projected 450-acre area comprising the ODG. Given that this type of hazard exists, UXO technicians will be required to provide support prior to and during site clearing and throughout geophysical investigation and mapping of the ODG. This support will include surface inspection, and removal and demolition of suspected UXO/OE on the ground surface if necessary. No intrusive activity is projected.

Potential items that may be encountered within the ODG include scrap metal, ORS, and OE items ranging from 20-millimeter (mm) to 81-mm projectiles. The 81-mm projectile is considered the Most Probable Munitions (MPM) per the *Engineering Evaluation/Cost Analysis (EE/CA)* (Parsons, 2001) submitted by Parsons Engineering in September 2001, and approved in the *ESS* (USACE, 2002). Although larger items ranging from 90-mm to 120-mm were also documented in the *EE/CA*, many of these items were found to be empty, and not expected to exist on the surface. The UXO technicians will inspect the surface, and remove or destroy UXO/OE items as necessary prior to performing site clearing and geophysical activities. The inspection will be performed at all locations within the 2,500 ft radius that are to be cleared and subsequently mapped.

SECTION 4

FIELD ACTIVITIES

4. FIELD ACTIVITIES

The fieldwork will generally consist of mobilization, site preparation, site clearing, GPO and full-scale geophysical mapping, UXO avoidance support, and demobilization. These major activities can be summarized as follows:

- **Activity 1 - Mobilization**: This task will include setting up temporary facilities, mobilizing construction equipment and resources, and familiarizing project personnel with the site and the requirements for the work. Site mobilization will commence following the pre-construction meeting with USACE.

- **Activity 2 - Site Preparation**: This task will include installation of drainage and erosion control measures as necessary, site surveying to delineate work areas, confirming existing control points, installing new benchmark monuments, marking the inner and outer ODG radii (to the extent feasible), and establishing site clearing limits.

- **Activity 3 - Clearing Activities**: A maximum of 380 acres will be cleared of brush, and small vegetation less than six inches in diameter. It is anticipated that larger vegetation will not require removal.

- **Activity 4 - GPO and Full-Scale Geophysical Mapping**: This task will include performing GPOs at three locations, geophysically mapping 100% of lightly wooded areas, and 20% of heavily wooded areas using both towed-array and manual systems.

- **Activity 5 - UXO Support**: All UXO technicians will visually inspect areas to be cleared prior to performing any fieldwork in that area. This will be accomplished by placing UXO technicians side by side at distances of approximately 10 ft apart from one another. This distance is approximate only and may be increased or decreased in the field by the QC/Safety UXO Supervisor or by the Tech III UXO technician (positioned behind the Tech II's) based on the vegetative cover being inspected. In the event that a hazardous UXO/OE item is found, the UXO technicians will conduct proper demilitarization and disposal, which may include destruction using explosives. Any ORS that is identified that may hinder geophysical mapping activities will also be identified and removed. The UXO technicians will also provide support for both the clearing subcontractor and the geophysical mapping subcontractor will be provided during site work activities.

- **Activity 6 - Demobilization**: This task will include removing all equipment, temporary structures, and other items utilized during field activities from the project site.

SECTION 5

ACTIVITY HAZARD ANALYSIS

5. ACTIVITY HAZARD ANALYSIS

The activity hazard analysis is an ongoing process from the initiation of the SSHP preparation through the implementation and completion of field activities. Activity hazard analyses shall be completed for each task associated with the project. Site-specific activity hazard analyses are presented in this section for each activity associated with the project. Task-specific activity hazards, and appropriate control measures and response actions are presented in Table 5-1. Additional information can be found in the Field Operating Procedures (FLDs) presented in Section 2 of WESTON's *Safety Officer Field Manual*. A copy of this manual will be maintained on-site.

Equipment, inspection, and training requirements for each activity are identified in Table 5-2, and detailed in the FLDs referenced in Table 5-1. Health and safety equipment such as, Personal Protective Equipment (PPE), is described in Section 7 of this SSHP.

In addition to the hazards outlined in the Activity Hazard Analysis Sheets presented in Table 5-1, special hazards that have the potential to affect worker and public safety are described in detail below.

5.1 UNEXPLODED ORDINANCE/ORDINANCE AND EXPLOSIVES AND ORDINANCE-RELATED SCRAP

Implementation of the clearing activities and geophysical investigation and mapping activities will include removing vegetation and pulling a towed-array or equivalent system over the ODG site. A site radio will be provided to each clearing and geophysical team in order to maintain communications with the subcontractors, WESTON site personnel, and UXO technicians. There will be a maximum of two UXO technicians in addition to WESTON's UXO/Safety Officer that will be monitoring the areas that the clearing and geophysical crews will be actively working. Any suspect metal items that are encountered during the mapping activities will be reported to a UXO technician or WESTON's UXO/Safety Officer.

Table 5-1
Activity Hazard Analysis

Activity 1 & 2 - Mobilization and Site Preparation

Activity	Hazards	Hazard Control
Mobilization of manpower and equipment, establish work zones, locate utilities, install erosion controls, locate existing benchmarks, provide survey control, and install new concrete monuments.	***Chemical Hazards***—Non-intrusive activities; therefore, the risk level of exposure to site contaminants during this activity is low. Focus on hazard awareness and change of conditions.	No intrusive measures allowed during this activity. Wear appropriate PPE for skin protection and to prevent dermal contact. Avoid liquid pools and stained areas if possible. An initial visual survey will be conducted to confirm the levels of protection are correct for the activity.
	Physical Hazards—Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	The work area shall be visually inspected. Housekeeping - Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized and ice, snow and mud will be cleared from steps to reduce slip hazards. Work to be completed in adequate natural light or assure sufficient illumination is maintained. Site personnel shall conduct an initial walkover and the "buddy system" will be implemented. Fall protection (railing or Fall Arrest Systems) will be installed if work is to be conducted at a level higher than 6 ft. See FLD 02, FLD 11, FLD 12, and FLD 39.
	Manual Lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage area, in construction equipment, and strategically in the construction area. See FLD 31 and 32.

Table 5-1

Activity 1 & 2 - Mobilization and Site Preparation (continued)

Activity	Hazards	Hazard Control
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects.
	Electric Hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 ft from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35 and 38.
	Moving/heavy equipment operations.	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel shall be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLD 20, 22, 22A, 23, and 24.
	Hand tools, manual and power.	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Use tools properly and for their intended purpose. All power circuits used for hand tools will be protected by a ground fault circuit interrupter. All personnel will be trained on the proper use of all power tools. Lockout/ tagout procedures will be implemented per FLD 42 and 29 Occupational Safety and Health Administration (OSHA) 1910. Also see FLD 38.

Table 5-1

Activity 1 & 2 - Mobilization and Site Preparation (continued)

Activity	Hazards	Hazard Control
	Caught in/between/struck by or against an object.	Workers shall stay out of the swing area of all equipment and will not walk, work or stand near equipment being loaded or unloaded. No personnel shall ride on the equipment unless seats are provided. See FLD 20, 22A, 23, and 24. Ground personnel near operating heavy equipment will wear hard hats and traffic vests. The handling and placement of heavy equipment will be carefully coordinated. Materials and objects will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. Backup alarms will be in operable condition. Unnecessary backing will be avoided. Safety toe footwear will be required. Tools will be properly used. Due to the remote nature of the site, it is anticipated that reflective vests will not be required (due to limited traffic); however, this shall be monitored by the SSHO and revised if necessary.
	Inclement weather, heat/cold stress	Workers shall be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH), National Institute for Occupational Safety and Health (NIOSH) guidelines and FLD 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO, operations are to cease during severe weather conditions, see FLD 02 – Inclement weather.
	Traffic	Work areas will be clearly barricaded using existing SEDA gates and appropriate signs displayed. Traffic will be rerouted as necessary. Persons working in traffic area, near roadways or directing traffic will wear high visibility (reflective) vests. Posted speed limit of 15 miles per hour. See FLD 20.

Table 5-1

Activity 1 & 2 - Mobilization and Site Preparation (concluded)

Activity	Hazards	Hazard Control
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid poisonous plants and avoid contact. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table 5-1

Activity 3— Site Clearing

Activity	Hazards	Hazard Control
Approximately 380 acres of land may be cleared of brush, vegetation and trees for preparation of the geophysical survey. All vegetation less than six inches in diameter will be cut and removed as necessary.	***Chemical Hazards***—The potential for exposure to petroleum and diesel products exist for this task.	Vehicles will not be over-filled and caution will be used whenever refueling. Refueling will not be conducted within 100 ft of an open flame.
	Physical Hazards—Slip, trips, falls; tools, terrain or vegetation, uneven walking surfaces; weather hazards; poor visibility.	The work area shall be visually inspected. Housekeeping - Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized and ice, snow and mud will be cleared from steps to reduce slip hazards. Work to be completed in adequate natural light or assure sufficient illumination is maintained. Site personnel shall conduct an initial walkover and the "buddy system" will be implemented. Fall protection (railing or Fall Arrest Systems) will be installed if work is to be conducted at a level higher than 6 ft. See FLD 02, FLD 11, FLD 12, FLD 39.
	Grubbing and vegetation removal. Chain saws and chippers.	Chain saws, chippers, and land clearing equipment will be operated by qualified persons. Chain saw operators will wear chaps. Chippers will be inspected before use, operators will be refreshed in operation by the vendor, all guards will be in place, and per EM 385-1-1 direction, the distance from chipping blades to the ground along the center line of the feed hopper will be maintained at 72-inches. Persons cutting trees will be appropriately trained and experienced. Trees to be cut will be checked by experienced persons prior to cutting to identify increased hazard situations. Retreat routes from trees to be cut will be planned before cutting begins, and no one will be permitted within two tree lengths of trees being cut. See FLD 47.
	Manual Lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.

Table 5-1

Activity 3— Site Clearing (continued)

Activity	Hazards	Hazard Control
	Inclement weather, heat/cold stress	Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines and FLD 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO, operations are to cease during severe weather conditions, see FLD 02 – Inclement weather.
	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel shall be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLD 20, 22, 22A, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of potential hazards and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for ice and rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH threshold limit values (TLVs) will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of: Audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.

Table 5-1

Activity 3— Site Clearing (concluded)

Activity	Hazards	Hazard Control
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage area, in construction equipment, and strategically in the construction area. See FLD 31 and 32.
	Electric Hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 ft from overhead electric lines. Electrical Installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35 and 38.
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid poisonous plants and avoid contact. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table 5-1

Activity 4—Geophysical Prove-Out and Full-Scale Geophysical Mapping

Activity	Hazards	Hazard Control
Approximately 380 acres of land will be geophysically surveyed using a vehicle towed-array or hand towed system.	***Chemical Hazards***—The potential for exposure is present while conducting these activities because the soil and sediment may be contaminated. The risk level associated with these activities is moderate.	Engineering controls will be utilized as necessary. Avoid direct contact with sediment and also spills and splash of water. Appropriate PPE will be utilized during these activities. It is not anticipated that air monitoring will be required since minimal intrusive activity is required. The only intrusive operation will be performed during data re-acquisition (i.e., target confirmation).
	Physical Hazards—Slip, trips, falls, equipment, materials, tools, terrain, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected by UXO technicians prior to the start of mapping activities. Housekeeping - Slip, trip, and fall hazards shall be either removed or marked and barricaded. Geophysical teams will be dealing with uneven terrain. Slips, Trips, and Fall hazards will be the most prevalent. Sufficient illumination shall be maintained to ensure a safe working environment and weather conditions to be continuously monitored. The "buddy system" will be implemented. See FLD 02, FLD 11, FLD 12, FLD 39.
	Manual Lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Inclement weather, heat/cold stress	Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines and FLD 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO, operations are to cease during severe weather conditions, see FLD 02 – Inclement weather.

Table 5-1

Activity 4— Geophysical Prove-Out And Full-Scale Geophysical Mapping (continued)

Activity	Hazards	Hazard Control
	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel shall be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLD 20, 22, 22A, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of: Audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage area, in construction equipment, and strategically in the construction area. See FLD 31 and 32.

Table 5-1

Activity 4— Geophysical Prove-Out And Full-Scale Geophysical Mapping (concluded)

Activity	Hazards	Hazard Control
	Electric Hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 ft from overhead electric lines. Electrical Installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35, and 38.
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid and identify poisonous plants, insects and snakes. Poison ivy is abundant in the work zone. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table 5-1

Activity 5—UXO Avoidance Support

Activity	Hazards	Hazard Control
UXO Technicians will conduct a surface inspection of areas to be cleared and mapped. If any hazardous items are found they will be identified (if possible), moved, and destroyed as necessary.	***Ordnance-*** The MPM is the M374 81-mm high explosive. Additionally 20-mm, 75-mm, 105-mm and 155-mm projectiles have been found out to a distance of 2,100 ft from the ODG proper.	All ordnance items will be positively identified prior to movement. Positively identify any fuzing associated with munitions item. If found fuzed do not handle. If unfuzed may be moved to central location with approval of UXO Safety Officer. OE operations will be conducted during daylight hours only. If an unknown ordnance item is found the USACE OE Specialist will be notified. Do not approach a smoking White Phosphorous munitions, the burning White Phosphorous may detonate the explosive burster at any time. Do not transport White Phosphorous munitions unless they are immersed in water, mud, or wet sand
	Demolition Operations- Unintentional Detonations	All demolition activities will be performed in accordance with 60A-1-1-31 and as outlined in the Explosive Operations for Seneca Army Depot Activity Guide. Demolition procedures will be non-electric.
	Chemical Hazards— White Phosphorous, Explosives	Avoid movement of a White Phosphorous munition. Avoid inhalation of and skin contact with smoke, fumes, and vapors of explosives and related hazardous materials.
	Physical Hazards—Slip, trips, falls, equipment, materials, tools, terrain, uneven walking surfaces; weather hazards; poor visibility	The work area will be visually inspected. Housekeeping – Slip, trip, and fall hazards shall be either removed or marked and barricaded. Geophysical teams will be dealing with uneven terrain. Slips, Trips, and Fall hazards will be the most prevalent. Sufficient illumination shall be maintained to ensure a safe working environment and weather conditions to be continuously monitored. The "buddy system" will be implemented. See FLD 02, FLD 11, FLD 12, FLD 39.
	Manual Lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.

Table 5-1

Activity 5—UXO Avoidance Support (continued)

Activity	Hazards	Hazard Control
	Inclement weather, heat/cold stress.	Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines and FLD 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO, operations are to cease during severe weather conditions, see FLD 02 – Inclement weather.
	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel shall be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLD 20, 22, 22A, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of: Audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary see FLD 01.

Table 5-1

Activity 5—UXO Avoidance Support (concluded)

Activity	Hazards	Hazard Control
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage area, in construction equipment, and strategically in the construction area. All explosives to be stored in an USACE/SEDA approved Igloo. See FLD 31 and 32.
	Electric Hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 ft from overhead electric lines. Electrical Installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35, and 38.
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid and identify poisonous plants, insects and snakes. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table 5-1

Activity 6—Demobilization

Activity	Hazards	Hazard Control
All equipment, materials, and personnel and temporary facilities will be removed from the site.	***Chemical Hazards***—Contaminated source areas will have been removed, therefore, the risk level associated with these activities is low.	No intrusive measures allowed during this activity. Wear appropriate PPE for skin protection and to prevent dermal contact. Avoid liquid pools and stained areas if possible. An initial visual survey will be conducted to confirm the levels of protection are correct for the activity.
	Physical Hazards—Slip, trips, falls, equipment, materials, tools, terrain, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected. Housekeeping – Slip, trip, and fall hazards shall be either removed or marked and barricaded. Geophysical teams will be dealing with uneven terrain. Slips, Trips, and Fall hazards will be the most prevalent. Sufficient illumination shall be maintained to ensure a safe working environment and weather conditions to be continuously monitored. The "buddy system" will be implemented. See FLD 02, FLD 11, FLD 12, FLD 39.
	Caught in/between/struck by or against an object.	Workers shall stay out of the swing area of all equipment and will not walk, work or stand near equipment being loaded or unloaded. No personnel shall ride on the equipment unless seats are provided. See FLD 20, 22A, 23, and 24. Workers operating equipment and/or exposed to traffic hazards will wear traffic/reflectorized vests and hard hats. The handling and placement of heavy equipment will be carefully coordinated. A traffic control system for positioning and moving haul vehicles will be established. Heavy vehicle operators may remain in their vehicles only if they have cab over protection. If operators must check loads, loading will cease until the operator is back in the cabin or away from the vehicles in a safe location. Materials and objects will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. Backup alarms will be in operable condition. Unnecessary backing will be avoided. Safety toe footwear will be required. Tools will be properly used. Due to the remote nature of the sites, it is anticipated that vests will not be required, however, this shall be monitored by the SSHO.

Table 5-1

Activity 6—Demobilization (continued)

Activity	Hazards	Hazard Control
	Moving/heavy equipment operations.	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel shall be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLD 20, 22, 22A, 23, and 24.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage area, in construction equipment, and strategically in the construction area. See FLD 31 and 32.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of: Audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Traffic	Work areas will be clearly barricaded using existing SEDA gates and appropriate signs displayed. Traffic will be rerouted as necessary. Persons working in traffic area, near roadways or directing traffic will wear high visibility (reflective) vests. Posted speed limit of 15 miles per hour. See FLD 20.
	Electric Hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 ft from overhead electric lines. Electrical Installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35 and 38.

Table 5-1

Activity 6—Demobilization (concluded)

Activity	Hazards	Hazard Control
	Inclement weather, heat/cold stress.	Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines and FLD 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO, operations are to cease during severe weather conditions, see FLD 02 – Inclement weather.
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid and identify poisonous plants, insects and snakes. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time.

Table 5-2
Equipment and Training Requirements

Task/Activity	Equipment	Inspection	Training
Mobilization/Demobilization and Site Preparation	Equipment to be brought by subcontractor.	The subcontractor shall be required to conduct daily inspections and necessary maintenance for the equipment. Follow WESTON Inspection requirements per WESTON Health & Safety Program.	Equipment will be operated by qualified operators. An initial site-specific training will be conducted. Daily safety meetings will be conducted before beginning the work. Safe work practices, and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the site and availability of Material Safety Data Sheet (MSDS).
Site Clearing	Excavator, Hydra-Ax, Chainsaw, Hand saws. Brush-cutter, Trailer Dump	Heavy equipment inspected daily and maintained based on use. Chainsaw operators will wear face mask, leg protection, hand protection, American National Standards Institute (ANSI) approved footwear and hearing protection.	Workers involved in the clearing operation will be qualified and conduct activities in accordance with OSHA 29 CFR-1910.266 and COE EM 385-1-1 Section 31. Daily safety meetings will be conducted stressing the importance of conducting the clearing activities in a safe manner.
GPO and Full-Scale Mapping	EM-61 MK 2, Trimble GPS Survey Equipment	Equipment will be properly stored, inspected and calibrated on a daily basis.	Equipment will be operated by qualified operators with 40-hr training with 8-hr refresher course. An initial site-specific training will be conducted. Daily safety meetings will be conducted before beginning the work. Safe work practices, and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the site and availability of MSDS.
UXO Avoidance Support	Schonstedt GA52 CX (only as is necessary)	As above.	As above.
Demobilization	Not Applicable	As above.	As above.

Every effort will be made to identify any suspect UXO/OE items. The UXO/OE item will be visually examined for markings and other external features such as shape, size, and external fittings. If an unknown UXO/OE item is encountered, the on-site USACE representative will be notified immediately. Under no circumstances will any fuzed UXO be moved in an attempt to make a definitive identification.

As a general rule, all fuzed UXO/OE will be detonated in the original position found [blown-in-place (BIP)]. This is the safest method to effect final disposition of munitions. Any item to be BIP will be sandbagged to mitigate blast effects and fragmentation projection.

Only UXO-qualified personnel will handle UXO/OE items, and only during daylight hours. Personnel who will be handling UXO/OE items will not wear outer or inner garments having static-electricity-generating characteristics such as, nylon.

Non-UXO-qualified personnel (i.e., site survey technician) who have been determined to be essential for the operations being performed may be utilized to perform OE-related procedures when supervised by a UXO Technician III or a UXO-qualified individual of higher rank than UXO Technician III. All WESTON and subcontractor personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards associated with UXO/OE items. All field personnel will be under the direct supervision of a UXO Technician III or higher.

Prior to any action being performed on an ordnance item, all fuzing will be definitively identified. This identification will consist of fuze type by function and condition (armed or unarmed) and the physical state/condition of the fuze (burned, broken, parts exposed/ sheared, etc.). General UXO/OE safety guidelines are listed below:

- Projectiles containing base-detonating fuzes are to be considered armed if the round is fired.
- Arming wires and pop out pins on unarmed fuzes should be secured prior to moving UXO/OE items.
- Do not depress plungers, turn vanes, or rotate spindles, levers, setting rings, or other external fittings on UXO/OE items.
- Do not attempt to remove or dismantle any components of UXO/OE items.

- Unexploded ordinance/OE personnel are not authorized to render inert any UXO/OE items found on-site.
- Unexploded ordinance/OE items will not be taken from the site.
- Consider UXO/OE items, which may have been exposed to fire and detonation as extremely hazardous.
- Do not rely on the color-coding of UXO/OE items for definitive identification.
- Avoid approaching the forward area of an OE item until it can be determined whether or not the item contains a shaped charge. The explosive jet, which is formed during detonation, can be lethal at great distances. Assume that all shaped-charge munitions contain a piezoelectric fuzing system until investigation proves otherwise. Piezoelectric fuzing is extremely sensitive.
- Assume that a practice OE item contains a live charge until investigation proves otherwise. Expended pyrotechnic and practice devices can contain red or white phosphorus residue. Due to incomplete combustion, this residue may re-ignite spontaneously if the crust is broken and exposed to air.
- Do not approach a smoking WP munition. Burning WP may detonate the explosive burster charge at any time.

5.2 WORKING NEAR WATER

Personnel may perform work over or adjacent to water (Reeder Creek, for example) where a drowning hazard exists. Work performed under these conditions will meet the requirements of USACE EM385-1-1, Section 5. Specific safety requirements and operating procedures are detailed in FLD 19. The SSHO will conduct site-specific training prior to initiating this work. Geophysical mapping will be conducted in all areas less than 1-ft deep using hip boots. No areas greater than 1-ft deep will be mapped unless otherwise directed by WESTON (with sufficient protection) and approved of by USACE. In the event the limitations of the equipment prohibit mapping at a depth of 1 ft, the equipment will be used in shallower areas (to the extent feasible).

5.3 EQUIPMENT OPERATION

Before any machinery or mechanized equipment is placed in use, it will be inspected, tested, and certified to be in safe operating condition in strict accordance with the manufacturer's directions and applicable OSHA regulations. Safety inspections and equipment calibration will be required

at the beginning of each workday. Any machinery or equipment found to be unsafe will be staged outside the work zone; its use prohibited until unsafe conditions have been corrected. Only qualified personnel will operate machinery and mechanized equipment or instrumentation. Equipment deficiencies observed on any item that affect its safe operation will be corrected before continuing operation; otherwise, the item will be tagged out-of-use.

5.4 CHEMICAL HAZARDS

The presence of chemical hazards creates potential personnel exposure via inhalation, ingestion, absorption, or contact with contaminants present in liquids, soil or air. Site clearing activities and related site work may require the use of concentrated chemicals for proper equipment operation and/or decontamination. Such chemicals may include the following:

- Diesel fuel
- Gasoline
- Chainsaw Bar Oil
- Oil & Grease

Site personnel will comply with the storage, handling and use requirements stated on the MSDS for each chemical brought on-site by WESTON or its subcontractors. An inventory of all chemicals brought on-site, and an MSDS for each will be maintained at the site. All subcontractors shall inform WESTON of any chemical materials brought on-site, and the location of their MSDSs.

In addition to the chemicals listed above, UXO or OE may be encountered on-site. Activity No. 5 in Table 5-1 will be followed in the event UXO or OE items are identified. A Site Specific Hazard Communication Program is contained in Appendix A.

5.5 BIOLOGICAL HAZARDS

Sources of biological hazards may include wild animals, insect bites (ticks, bees, mosquitoes, etc.), poisonous plants, snakes, rats, mice, and bats. Site personnel will be instructed to be alert for and avoid wild animals, to wear long pants and shirts while working in brush, and to use insect repellant. Any site worker who is knowingly allergic to insect bites will be required

to inform the SSHO, and carry an allergy response kit. First aid providers will also be required to know how to use the response kit.

5.6 ACTIVITY HAZARD ANALYSIS TABLES

Hazard Analysis Tables provide a task-specific evaluation of the known or potential hazards associated with performing individual tasks within the SOW. Each analysis also contains task-specific information related to hazard control and mitigation, including: the use of specific engineering control measures, specific standard operating procedures to be implemented, and PPE to be used as required. If site conditions or tasks change, the SSHO will evaluate the new conditions or task, and will contact the PSO for assistance in developing amendments to the SSHP. Amendments made to the SSHP will be forward to the USACE for final approval, and all field personnel will be made aware of these changes. The site-specific activity hazard analysis is presented in Table 5-1.

SECTION 6

ACTION LEVELS

6. ACTION LEVELS

Personal Protective Equipment will be required as described in Section 7 (Levels of Protection) of the SSHP.

Hazard awareness, identification, and notification of potential UXO/OE items will be conducted as described in Section 5 (Activity Hazard Analysis) of the SSHP.

It is not expected that any airborne contaminants or nuisance dust level thresholds will be exceeded due to the nature of the investigation activities (i.e., minimal intrusive operations). As a result, no air monitoring will be performed.

SECTION 7

LEVELS OF PROTECTION

7. LEVELS OF PROTECTION

All personnel performing operations on-site shall be required to use the appropriate level of protection. The minimum level of protection required to begin each activity of this project is shown in Table 7-1. If hazards are identified requiring a lower or a higher level of protection, then this SSHP will be re-evaluated and upgraded or downgraded prior to re-entry to the site.

Table 7-1

Minimum Level of Protection Requirements

Activity	Level of Protection
Mobilization/Demobilization/Site Preparation	Level D or Modified Level D
Clearing Activities	Level D
Surveying Activities	Level D
Geophysical Survey	Level D
UXO Support/Demolition	Level D or Modified Level D

7.1 LEVEL D PERSONAL PROTECTION EQUIPMENT

Level D PPE will be worn during site mobilization/demobilization, and other non-intrusive activities where no known contamination is present. Level D PPE consists of:

- Work clothes such as, coveralls; long pants; shirts with sleeves; etc.
- Clothing under coveralls.
- Work gloves – leather or cotton as necessary for physical hazards.
- Polyvinyl chloride or latex surgical/lightweight gloves when sampling or handling potentially contaminated surface items
- Boots, certified according to ANSI.
- Safety glasses or safety goggles (as necessary).
- Hard hat (as necessary).

7.2 LEVEL D MODIFIED PERSONAL PROTECTION EQUIPMENT

Modified Level D PPE will be worn when conducting activities with known or potential contact with minimally contaminated materials. For this site, contaminants could include explosives or UXO items. In addition to Level D components, Modified Level D consists of:

- Chemical resistant outer clothing.
- Disposable chemical resistant boot covers.
- Gloves – nitrile or latex inner; chemical resistant outer.
- Flash protective garments such as, *Nomex* or equivalent (as necessary).

Note: Level D modified may be necessary in the event equipment requires decontamination as a result of intrusive operations (i.e., setting survey monuments, verifying target anomalies, etc).

SECTION 8

EMERGENCY RESPONSE

8. EMERGENCY RESPONSE

8.1 EMERGENCY CONTACTS

The following emergency telephone numbers shall be prominently posted in WESTON's field office:

Service	Telephone Number
Emergency Service (Ambulance, fire, Police) Seneca County Sheriff's Dispatch	(315) 539-9241
Ambulance (non-emergency) South Seneca Ambulance service	(315) 539-9241
Seneca County Police – (non-emergency)	(315) 539-9241
Romulus Fire Department – (non-emergency)	(607) 869-9611
Spill Response - CHEMTREC	(800) 424-9300
EPA Region 2 Emergency Response	(800) 424-8802
Hospital: Geneva General Hospital 196 North Street Geneva, New York 14456	(315) 787-4000
Poison Control Center (New York)	(800) 962-1253
WESTON Medical Emergency (Continuum)	(800) 229-3674
WESTON Emergency (24 hour) (West Chester)	(610) 692-3000
Site Manager - John Williams	(607) 869-2485
UXO Safety/QC – Frank Henderson	(607)869-2485 / (781) 799-9693 cell
WESTON Technical Director - Ted Blackburn (pager)	(800) 206-0364
WESTON CIH - George Crawford (pager)	(800) 206-1507
WESTON PM - Chris Kane	(603) 656-5428
Rapid Design Manager - Tom Westenburg	(402) 880-7329
SEDA BRAC Coordinator - Steve Absolom	(607) 869-1309
CENAN PM - Randy Battaglia	(607) 869-1523
CENAN PE - Tom Battaglia	(607) 869-1353
CENAB OE Safety Specialist – Frank J. Magner	(607) 869-1912 / (410) 320-9495 cell

In the event of an emergency requiring outside emergency services, WESTON personnel will immediately dial the Seneca County Sheriff to contact the appropriate organization. Following the phone call, WESTON personnel will contact on-site USACE personnel to inform them that emergency service personnel and equipment will be entering the facility. Subsequent to these notifications, appropriate off-site USACE and WESTON personnel will be contacted and informed regarding the situation. The Emergency Response Contingency Plan (ERCP) is contained in Appendix B.

8.2 HOSPITAL ROUTE

Geneva General Hospital is the closest hospital to the site. It is located at 196 North Street in Geneva, New York. Travel distance and driving time to the hospital are approximately 12 miles or approximately 15-20 minutes. A map showing the route to the hospital will be posted near the site telephone, and in each site vehicle, and a written description of the route will be attached to the map. The hospital route will be verified prior to work initiation. A copy of the hospital route map is included in Attachment 5 of the ERCP (Appendix B).

SECTION 9

LOGS, REPORTS, AUDITS, INSPECTIONS, AND RECORDKEEPING

9. LOGS, REPORTS, AUDITS, INSPECTIONS AND RECORDKEEPING

9.1 SAFETY LOG

The SSHO will maintain a Safety Log of all safety-related activities. The SSHO is responsible for ensuring that health and safety activities for the day, as well as safety meeting minutes, are included within the log or filed appropriately.

9.2 INJURY/ILLNESS/INCIDENT REPORTS

In the event that a reportable accident/incident occurs at the site, the WESTON Incident Form will be completed and forwarded within 48 hours to WESTON's PSO, the Contracting Officer's Representative, and the USACE OE Safety Specialist. For any incident, near miss, or unintentional detonation, appropriate investigation, documentation and corrective actions will be completed and also reported to WESTON's PSO and the USACE OE Safety Specialist.

9.3 TRAINING LOG

The SSHO is responsible for ensuring that all training conducted relative to job site activities is documented appropriately.

9.4 VISITOR LOG

A Visitor Log will be maintained at the site office to record visitations to the site.

9.5 INSPECTION FORMS

Daily safety and health inspections will be conducted by the SSHO with the results recorded in the Safety Log. The PSO will conduct periodic safety and health audits to ensure site personnel are performing the tasks in accordance with the WP and this SSHP.

APPENDIX A

SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM

APPENDIX A
SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM

Location-Specific Hazard Communications Program/Checklist

In order to ensure an understanding of, and compliance with, the Hazard Communication Standard, Weston Solutions, Inc. (WESTON$_{SM}$) will utilize this checklist/document (or similar document) in conjunction with the WESTON *Written Hazard Communications Program* as a means of meeting site or location specific requirements. While responsibility for activities within this document reference the WESTON Site Safety and Health Officer (SSHO), it is the responsibility of all personnel to effect compliance. Responsibilities under various conditions can be found within the WESTON *Written Hazard Communication Program*.

To ensure that information about the dangers of all hazardous chemicals used by WESTON are known by all affected employees, the following hazardous information program has been established. All affected personnel will participate in the hazard communication program. This written program as well as WESTON's *Corporate Hazard Communication Program* will be available for review by any employee, employee representative, representative of Occupational Safety and Health Administration, National Institute for Occupational Safety and Health, or any affected employer/employee on a multi-employer site.

___ Site or other location name/address: ***Seneca Army Depot Open Detonation Grounds, Seneca, New York***

___ Site/Project/Location Manager: ***John Williams*** (Site Manager)/***Chris Kane*** (Project Manager)

___ Site/Location Safety Officer: ***Frank Henderson***

___ List of chemicals complied, format: HASP: **X** Other:_____

___ Location of Material Safety Data Sheets (MSDS) Files: ***Field Office***

___ Training Conducted by (name and date): _____

___ Indicate format of training documentation: Field Log: **X** Other:_____

___ Client briefing conducted regarding hazard communication_____

___ If multi-employer site, indicate name of affected companies:

_____

___ Other employer(s) notified of chemicals, labeling and MSDS information: _____

___ WESTON notified of other employer's or clients hazard communication program as necessary.

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and attached to this document or in a centrally identified location with the MSDS. Further information on each chemical may be obtained by reviewing the appropriate MSDS. The list will be arranged to enable cross-reference with the MSDS file and the label on the container. The SSHO or location manager is responsible for ensuring the chemical listing remains up-to-date.

Container Labeling

The WESTON SSHO will verify that all containers received from the chemical manufacturer, importer or distributor for use on site will be clearly labeled.

The SSHO is responsible for assuring labels are placed where required and for comparing MSDS and other information with label information to ensure correctness.

Material Safety Data Sheets

The SSHO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SSHO will make sure procedures are developed to obtain the necessary MSDS and will review incoming MSDS for new or significant health and safety information. He/she will see that any new information is passed on to the affected employees. If an MSDS is not received at the time of initial shipment, the SSHO will call the manufacturer and have a MSDS delivered for that product in accordance with the requirements of WESTON's *Written Hazard Communication Program*.

A log for, and copies of, MSDS for all hazardous chemicals in use will be kept in the MSDS folder at a location known to all site workers. The MSDS will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SSHO or designated alternate. When revised MSDS are received the SSHO will immediately replace the old MSDS.

Employee Training and Information

The SSHO is responsible for the WESTON site-specific personnel training program. The SSHO will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the worksite.
- Physical and health risks of the hazardous chemicals.
- The signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and written hazard communication program.
- How to determine the presence or release of hazardous chemicals in the employees work area.
- How to read labels and review MSDS to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.

- How to reduce or prevent exposure to hazardous chemicals through use of controls procedures, work practices and personal protective equipment.
- Hazardous, non-routine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

When employees are required to perform hazardous non-routine tasks the affected employee(s) will be given information by the SSHO about the hazardous chemicals he or she may utilize during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use and steps WESTON is using to reduce the hazards. These steps include, but are not limited to: ventilation, respirators, presence of another employee, and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee shall contact the SSHO at which time information as to; the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and safety precautions, which should be taken, will be determined and presented.

Multi-Employer Worksites

It is the responsibility of the SSHO to provide other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of SSHO and the site manager to obtain information about hazardous chemicals used by other employers to which WESTON employees may be exposed. WESTON's chemical listing will be made available to other employers as requested. The MSDS will be available for viewing as necessary. The location, format and/or procedures for accessing MSDS information must be relayed to affected employees.

APPENDIX B

EMERGENCY RESPONSE CONTINGENCY PLAN

U.S. Army Corps of Engineers

Omaha District
Offutt AFB, Nebraska

SENECA ARMY DEPOT ACTIVITY
TIME SENSITIVE GEOPHYSICAL INVESTIGATION
OPEN DETONATION GROUNDS
SENECA COUNTY
ROMULUS, NEW YORK

Contract No. DACA45-98-D-0004
Task Order No. 0037

FINAL
EMERGENCY RESPONSE
AND CONTINGENCY PLAN

May 2003

01M-0007

WESTON SOLUTIONS
Restoring Resource Efficiency

FINAL

SENECA ARMY DEPOT
EMERGENCY RESPONSE AND CONTINGENCY PLAN
TIME SENSITIVE GEOPHYSICAL INVESTIGATION
OPEN DETONATION GROUNDS
SENECA COUNTY
ROMULUS, NEW YORK

Contract No. DACA45-98-D-0004
Task Order No. 0037

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
Castle Hall Building No. 525,
3rd Floor
Offutt AFB, Nebraska

Prepared by:

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

May 2003

W.O. No. 20074.515.037

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS
(continued)

LIST OF ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act
ERC	Emergency Response Coordinator
ERCP	Emergency Response and Contingency Plan
EZ	Exclusion Zone
HazMat	hazardous material
HAZWOPER	Hazardous Waste Operations
MSDS	Material Safety Data Sheet
NRC	National Response Center
ODG	Open Detonation Grounds
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyls
PPE	personal protective equipment
ppm	parts per million
PSO	Program Safety Officer
RCRA	Resource Conservation and Recovery Act
RQ	reportable quantity
RSO	Regional Safety Officer
SEDA	Seneca Army Depot Activity
SSHO	Site Safety and Health Officer
TPQ	Threshold Planning Quantity
TSCA	Toxic Substance Control Act
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
WESTON$_{SM}$	Weston Solutions, Inc.

SECTION 1

INTRODUCTION

1. INTRODUCTION

This Emergency Response and Contingency Plan (ERCP) was prepared by Weston Solutions, Inc. (WESTON$_{SM}$) in accordance with the Scope of Work dated 25 March 2003, prepared by the U.S. Army Corps of Engineers (USACE), Omaha District for the Time-Sensitive Geophysical Investigation at the Seneca Army Depot Activity (SEDA) in Romulus, New York.

The work to be performed under the ERCP is described in WESTON's Geophysical Investigation Work Plan, and Site Safety and Health Plan, to which this ERCP is appended. This ERCP has been prepared to describe actions that will be taken by WESTON site personnel in the event of an emergency situation.

The purpose of this plan is to:

- Anticipate events to ensure proper planning and preparation.
- Act as a guide in the event of an emergency situation.
- Minimize hazards to human health and the environment from anticipated emergency events.
- Familiarize response personnel with equipment and procedures.

This ERCP complies with the following regulatory requirements:

- Occupational Safety and Health Administration (OSHA)
  - Emergency Action Planning
  - Process Safety Management
  - Hazardous Waste Operations (HAZWOPER)
- Department of Transportation
  - Reporting and response actions
- U.S. Environmental Protection Agency (EPA)
  - Spill Prevention, Containment, and Countermeasures
- Resource Conservation and Recovery Act (RCRA) and Risk Management Plan

- State of New York Department of Environmental Conservation
- U.S. Army Corps of Engineers Regulations, Manuals, and Engineer Pamphlets

SECTION 2

PRE-EMERGENCY PLANNING

2. PRE-EMERGENCY PLANNING

In order to handle emergencies properly and effectively at the Open Detonation Grounds (ODG), planning and training are essential. Pre-emergency planning procedures must be in place to immediately respond to emergency situations. Site personnel must be knowledgeable of their roles and responsibilities and act within their abilities and training. Employees will be prohibited from responding to emergency situations that would require them to be exposed to hazards beyond their degree of training. As necessary (by regulation), and prior to site activities, the Site Safety and Health Officer (SSHO), or designated alternate will communicate with outside emergency response agencies (e.g., fire, police, ambulance, and medical) to coordinate response actions. For the purpose of this contingency plan the unexploded ordnance (UXO) Quality Control/Safety Officer will fulfill the duties of the SSHO as well. Each response agency will be informed of any changing site conditions that may affect emergency response actions. A complete list of emergency contacts can be found in Attachment 1.

Copies of this ERCP will be made available to the appropriate emergency response agencies, the State Emergency Response Commission, and the Local Emergency Planning Commission.

SECTION 3

ROLES AND RESPONSIBLILITIES

3. ROLES AND RESPONSIBILITIES

The SSHO will be the primary Emergency Response Coordinator (ERC). The SSHO or designated alternate will contact the appropriate personnel or authorities as determined by the type and nature of incident. The emergency contacts list is included in Attachment 1, which serves as documentation of the site-specific chain-of-command. This chain-of-command is established to minimize confusion and to leave no doubt as to whom has decision-making authority in the event of an emergency situation. In the event of an emergency, the additional procedures listed in Attachment 2 will be followed. Reporting forms and checklists for use during emergency situations are included in Attachment 3.

Due to the size of the ODG site, it will be mandatory for all personnel to carry a radio, or have access to a radio, at all times in the event of an emergency.

3.1 EMERGENCY RESPONSE COORDINATOR

The ERC responsibilities during emergency situations are as follows:

- Evaluate emergency situation and special needs.
- Direct all emergency efforts, including evacuation of personnel and assignment of personnel to response roles.
- Notify and interact with emergency response agencies.
- Oversee medical and decontamination procedures.
- Serve as the point of contact for local emergency response agencies and/or hazardous material (HazMat) teams.

The ERC responsibilities after the emergency phase is complete includes:

- Supervise cleanup efforts; ensure proper recovery, disposal, and accounting of any HazMat/waste.
- Ensure all emergency equipment and supplies are cleaned and/or made available for future use.
- Document incident, advise management, and initiate debriefing.

The ERC will delegate, as necessary, the specific roles and duties outlined above.

3.2 ALTERNATE EMERGENCY RESPONSE COORDINATOR

- The Site Manager is the primary backup to the ERC.
- Additional personnel may be trained as alternate ERCs based upon site complexity and/or size.

3.3 SITE MANAGER

- Alternate ERC
- Notify SEDA of media contact

3.4 PROGRAM SAFETY OFFICER

- Provide technical assistance and lead post-event investigations.

3.5 REGIONAL SAFETY OFFICER

- Receive reports from the ERC
- Provide information to appropriate management and track reports
- Workers compensation liaison
- Focal point for medical return to work
- Incident investigation as necessary

3.6 PROJECT MANAGER ROLE

- Assure funding as necessary for emergency operations.
- Report and interact with regulatory agencies and client as necessary.
- Media Contact (external contact with the media will be made through USACE/SEDA Public Affairs personnel).

3.7 EMERGENCY RESPONSE TEAMS

Based upon the size and complexity of the site or task activities, Emergency Response Teams will either be jointly comprised of all personnel on-site, cross-trained to actions necessary

(e.g., spills, confined space rescue, high-angle rescue), comprised of named individuals, local response agencies or a combination of the above.

SECTION 4

EMERGENCY RECOGNITION, PREVENTION, AND TRAINING

4. EMERGENCY RECOGNITION, PREVENTION, AND TRAINING

All WESTON personnel will be instructed on a daily basis to be constantly alert for potentially hazardous situations or conditions while conducting site work. Immediate recognition with necessary corrective actions of potential hazardous conditions can avert an emergency. Emergency response discussions will be incorporated into regular safety meetings and will include such topics as:

- Tasks to be performed.
- Hazards that may be encountered, along with their effects and how to recognize symptoms.
- Emergency procedures, including evacuation.

All WESTON personnel and subcontractor personnel will be required to have at a minimum the following training:

- Unexploded ordinance hazard awareness and identification.
- Procedures for reporting incidents.
- Roles and procedures in the event that an incident requires local, state, or federal emergency responders.
- Alarm systems and all applicable aspects of this ERCP.
- 40-hour HAZWOPER.
- 8-hour Annual HAZWOPER Refresher (if required).
- Site specific training.

In addition to the training requirements listed above, WESTON-specific training shall include:

- Hazard Communication Training
- At least one (1) member (SSHO) shall have 8-hour Site Health and Safety Coordinator Training
- At least two (2) members of the WESTON team shall have First Aid/Cardiopulmonary Resuscitation training.

SECTION 5

COMMUNICATION

5. COMMUNICATION

Daily environmental health and safety briefings will be used to remind personnel of their roles, responsibilities, and emergency procedures. A record of the safety briefings will be completed and maintained on-site.

Emergency communications will be voice, audible horn/alarm, or 2-way radio. A copy of the emergency telephone numbers included in Attachment 1 will be kept in WESTON site vehicles and the site office. Personnel will be instructed to immediately contact the SSHO or Site Manager if an emergency situation arises.

A backup emergency notification system will also be used during all site activities (e.g., air horns located at each work location). In the case of an emergency, the signal for personnel to evacuate the area will be a series of long blasts. The assembly/gathering point for individual work locations will be provided during the daily safety briefing. After a head count has been taken, further evacuation may be required based on wind direction and weather conditions. Five short blasts of the air horn will signal all clear, workers may than return to designated work areas.

Each type of communication will be tested to insure that site personnel can identify the signals above background noise, as well as to check for system efficacy and accuracy. In the event that air horns prove to be inefficient, alternative methods (e.g., 2-way radios) will be implemented and tested to prove efficient use. A list of emergency response equipment can be found in Attachment 2.

In the event of an emergency requiring outside assistance, the ERC or designated alternate will contact outside help using the nearest telephone or other pre-established means.

SECTION 6

SUPPORT AREAS, EVACUATION PROCEDURES, AND PERSONNEL ACCOUNTING

6. SUPPORT AREAS, EVACUATION PROCEDURES, AND PERSONNEL ACCOUNTING

The primary support area for all work at the site will be the range control building located outside the 2,500 feet Public Withdrawal Distance.

During clearing operations and geophysical mapping operations, the nearest firebreak road will be used as an evacuation route to the nearest perimeter road. Assembly areas are designated as the range control building and WESTON's on-site office. Means of accounting for site personnel and visitors will include sign-in logs. In the event of an evacuation, these logs will be brought to the assembly area in order to verify safe evacuation by all.

Alternate routes and assembly areas will be determined and utilized based upon wind speed and direction, as well as emergency requirements.

SECTION 7

EMERGENCY PROCEDURES

7. EMERGENCY PROCEDURES

7.1 GENERAL

During an emergency, the following actions will be taken, with some actions conducted concurrently. No one will attempt an emergency response/rescue until the situation has been assessed and the appropriate response outlined by the ERC or local responders.

It will be determined prior to work initiation, whether any tasks on-site are critical operations requiring one or more persons to shut down sensitive equipment in a time-critical manner. If it is determined that critical operations are evident, specific procedures will be outlined in Attachment 2.

Certain sites (e.g., UXO, chemical surety material) or clients (e.g., Department of Energy, Department of Defense) may have specific criteria and actions to be followed in the event of an emergency situation.

General guidelines for rescue/response may include the following:

- **Assessment:** Assess the type and extent of the emergency, then determine and verify existing and potential hazards to site personnel and the off-site population. Determine, based on the type and extent of the emergency, the following:
  - Whether and how to respond
  - The extent of any injuries and/or damage
  - The need for evacuation of site personnel and off-site population
  - The resources needed for evacuation and response
- **Evacuate:**
  - Move site personnel to a safe distance upwind of the incident.
  - Monitor the incident for significant changes. The hazards may diminish, permitting personnel to re-enter the site, or hazards may increase and require public evacuation.

***Note**: Should site personnel or visitors be handicapped to the point of needing assistance during an evacuation, the ERC will ensure that appropriate numbers of site workers are trained to provide any needed assistance.*

***Note**: Work sites with potential hazards that could involve adverse community risk, and require evacuation of the local community must be discussed and coordinated with the client and local fire and police agencies before fieldwork begins.*

- **Enforcing the buddy system:** Allow no one (including rescuers) to enter a contaminated area or hazardous area without a partner or without appropriate communications means and proper personal protective equipment (PPE). At the time of the incident, one person will be designated to record the names, time of entry, and time of exit for all personnel entering the Exclusion Zone (EZ). At all times, personnel in the EZ should be in line-of-sight or communications contact with the ERC or his designee.

- **Survey casualties:**

  - Locate all victims and assess their condition.
  - Determine resources needed for stabilization and transport.

- **Request Aid:** Contact the required off-site/on-site personnel or agencies (such as the ambulance, fire department, police, etc). Ensure that previous communications and understanding or response actions to be conducted by the off-site resources have been accomplished. In certain cases (e.g., confined space rescue), the off-site responder(s) must be brought to the site before work is initiated so that an evaluation of and training on the confined spaces is accomplished.

- **Allocate Resources:** Allocate appropriately qualified on-site personnel and equipment to the rescue and initiate incident response operations.

- Remove or assist victims from the area, using appropriate equipment and procedures.

- **Control measures, including containment:** Assist in bringing the hazardous situation under complete or temporary controls and use measures to prevent any escalation of the emergency.

- **Stabilize:** Administer any medical procedures that are necessary before the victim can be moved. Stabilize or permanently remediate the hazardous condition. Address the cause of the emergency and anything that was damaged or endangered by the emergency (e.g., drums, and tanks).

- **Transport:** No one will be transported without being decontaminated or protected from contaminating others. Measures will be taken to minimize chemical contamination of the transport vehicle, ambulance, and hospital personnel.

- **Casualty Logging:** Record the name(s) of the victim(s), the time, the destination, and their condition upon transport.

- **Casualty Tracking:** Record the disposition, condition, and location of the casualties.
- **Media Reporting:** Any request for information by the media will be referred to USACE/SEDA Public Affairs.

7.2 SECURITY ISSUES

Both routine and emergency response actions dictate the need for prevention of unauthorized access and for the protection of vital records and equipment. Site size, location, political or social environment, and equipment needs are criteria necessary to evaluate whether security (private or public) is needed. Weston Solutions, Inc. will maintain a locked access gate and office building when not in use. All WESTON and USACE personnel will have keys to these areas and will be contacted, if necessary, in the event of an emergency.

The Seneca County Sheriff's Department will be notified of site activities conducted, personnel on-site, site hazards and risks, and regulatory issues before work begins. Notifications will assist in coordination of efforts should police presence be required. The Sheriff's Department dispatches local fire departments as needed.

In the event of unauthorized access, personnel should avoid confrontation (verbal or physical). Attempts must be made to explain site hazards, and corporate and client expectations for a safe work site. Continued presence by unauthorized persons will require a team member to notify the USACE SEDA Post Gate No.1 Security Office and the local police force. Site activities may need to be halted in the event unauthorized persons create an adverse risk to themselves, to WESTON personnel, or to subcontractor personnel.

7.3 SEVERE WEATHER/NATURAL DISASTERS

In the event of adverse weather conditions occurring on-site such as lightning, high winds, tornado, hurricane, or extreme heat, the SSHO will instruct the workers to discontinue or modify field operations. These natural phenomena complicate work activities and add or increase risk to

all site personnel. The following actions should be evaluated or taken in the event of severe weather:

- Stop work.
- Secure all loose materials and equipment.
- Bring all workers to safe areas indoors when lightning or severe weather is in the immediate area.
- Verify that all buildings and trailer doors are locked and windows closed.
- Shut down and disconnect all non-critical electrical equipment to protect the equipment from electrical surges and abrupt power loss.

7.4 INJURY OR ILLNESS

In the event of injury or illness, site personnel will take the following action:

- Evaluate the scene for safe entry.
- Notify the SSHO and Site Manager.
- Assess the type and extent of injury.
- Provide initial first aid to injured personnel.
- Decontaminate the injured personnel, if or as necessary.
- If required and injury or illness not potentially life-threatening, transport to local medical facility.
- If injury or illness potentially life-threatening notify emergency medical services of need for transportation.
- Notify the Regional Safety Officer (RSO) and Project Manager.

7.5 EXTRICATION

In the event a person becomes trapped and requires extrication, site personnel will take the following action:

- Notify the SSHO and Site Manager
- Evaluate the scene for safe entry

- Contact the local Fire Department or Rescue Service
- Provide first aid as necessary
- Notify the RSO and Project Manager

7.6 CHEMICAL EXPOSURE

In the event of chemical exposure site personnel will take the following action:

- Evaluate the scene for safe entry.
- Notify the SSHO and Site Manager.
- Provide assistance with emergency shower, eyewash, or other initial First Aid, as required.
- Decontaminate exposed personnel.
- Notify emergency medical services of need for transportation as necessary.
- Notify the RSO and Project Manager.

Note: It is not anticipated that chemical exposure hazards exist, as the work being conducted is non-intrusive.

7.7 SMALL FIRE

A small fire is defined as a fire that can be extinguished with a 4A:20BC type fire extinguisher or incipient stage fires, which can safely be extinguished with material readily at hand. In the event of a small fire, site personnel will take the following actions:

- Evacuate all unnecessary personal from the area, if possible, to an upwind location.
- Notify the SSHO and Site Manager.
- Attempt to extinguish fire using portable fire extinguishers or by smothering from an upwind location.
- Request emergency response assistance as appropriate.
- Notify the RSO and Project Manager.

7.8 LARGE FIRE

In the event of a large fire, or a small fire that cannot be extinguished, the following actions will be taken:

- Sound alarm.
- Evacuate all unnecessary personnel from the area, if possible, to an upwind location.
- Notify local fire department; request other emergency response services (police, ambulance, and hospital) as needed.
- Notify the Site Manager and RSO, and other appropriate personnel or agencies.

7.9 EXPLOSION

In the event of an unplanned explosion, all personnel will evacuate the site. Required support equipment, services, and personnel will be requested. Response actions will follow the steps identified in Subsection 7.6 (Chemical Exposure), and Subsection 7.8 (Large Fires) of this ERCP. Any planned detonations will be performed by qualified UXO subcontractors in accordance with applicable local, state, and federal regulations.

7.10 SMALL SPILL

In the event of a small spill, appropriate actions will be taken to prevent the spill from reaching groundwater, surface water, or drains.

Actions include:

- Verification of spilled material, volume, and hazards.
- Determine appropriate response procedures including PPE [see Material Safety Data Sheets (MSDS) or Chemical Data Sheet].
- Assess quantity and size of the spill to determine the level of response to contain and clean it up.
- Confine or contain spill with booms, pads, or berm.
- Neutralize spill with appropriate agents (if safe/possible).

- Notify the RSO and Site Manager.
- Weston Solutions, Inc. will collect spilled material including absorbent material and place in appropriate containers. All HazMat shall be disposed of in accordance with all applicable hazardous waste regulations and client requirements.

Weston Solution, Inc. will keep all records related to the spill of hazardous waste for a period of at least three years after the spill has been cleaned up, or such longer period of time as required in any unresolved enforcement action.

Note: The MSDSs for materials on-site with potential to spill (e.g., gasoline, diesel, acids, solvents) will be located in an MSDS binder at the site office. Procedures and requirements for spill response will follow criteria outlined in the MSDS.

7.11 LARGE SPILL

A volume equal to or greater than the state or federal reportable quantity and/or those beyond the capabilities and resources of on-site personnel defines a large spill. Appropriate remedial actions will be conducted according to state and federal regulations.

General procedures are as follows:

- Verification of spilled material, volume, and hazards.
- As safe to do so, confine the spill to the smallest area possible using booms, pads, berms, or any other effective material.
- Assess type and extent of damages and injuries to personnel; take appropriate first aid steps if necessary.
- Notify the RSO and Site Manager.
- In the event that additional emergency clean-up assistance is needed, WESTON will request assistance from off-site response contractors.
- All hazardous waste, including contaminated booms and absorbent material, will be collected by WESTON personnel. All hazardous clean-up residues shall be disposed of in accordance with all applicable hazardous waste regulations.
- All emergency equipment will be decontaminated prior to being put back into service. Expendable or damaged supplies will be immediately replaced.

Weston Solutions, Inc. will keep all records related to the spill of hazardous waste for a period of at least three years after the spill has been cleaned up or such longer period of time as required in any unresolved enforcement action.

In the event of a spill or a release requiring agency reporting, the Project Manager will notify the client and appropriate regulatory agencies.

SECTION 8

CRITIQUES AND CORRECTIVE ACTIONS

8. CRITIQUES AND CORRECTIVE ACTIONS

Post emergency response activities include documentation, investigation and appropriate corrective actions to avoid future problems. The Program Safety Officer (PSO), operations safety staff, the RSO, or the SSHO will lead the post-incident critique to ensure worker knowledge of actions taken and proposals for changes as necessary. The SSHO and the RSO are responsible for documenting incident reports and providing communication to management. The PSO and/or operations safety staff is responsible for providing direction and assistance. Corrective actions necessary based upon appropriate review and investigation of the incident are required prior to assumption of work. In the event corrective actions cannot be made on an immediate basis, documented plans and schedules will be formulated.

ATTACHMENTS

ATTACHMENT 1
EMERGENCY CONTACTS

A copy of this form is to be posted near the site telephone, and in all site vehicles.

EMERGENCY CONTACTS AND PHONE NUMBERS	
SERVICE	**TELEPHONE NUMBER**
Ambulance Service	(315) 539-9241
Police	(315) 539-9241
Fire	(315) 529-9241
Hospital - Geneva General Hospital	(315) 787-4000
WESTON Medical Emergency (CONTINUM)	(800) 229-3674
WESTON Emergency (24 hour) (West Chester)	(610) 701-3000
WESTON Program or Operations Safety Officer - (George Crawford)	(601) 701-7406 (office) (800) 206-1507 (pager)
WESTON Regional Safety Officer (Ted Blackburn)	(603) 656-5442 (office) (603) 860-4457 (cell phone)
Other: (Project Director, Bruce Campbell)	(603) 656-5452
Client or Media Contact (Tom Battaglia – CENAN Project Engineer, Randy Battaglia - CENAN Project Manager, and Tom Westenburg – Omaha District)	(607) 869-1353 (Tom B.) (607) 869-1523 (Randy) (402) 880-7329 (Tom W.)
SSHO/ERC/UXO Safety Officer - Frank Henderson	(607)-869-5767 Cell: (781) 799-9693
EPA Region 2 Emergency Response	(800) 424-8802
Site Manager - John Williams	(607)-869-5767
Project Manager - (Chris Kane)	(603) 656-5428
CENAB OE Safety Specialist – Frank J. Magner	(607) 869-1912 / (410) 320-9495 cell

ATTACHMENT 2
EMERGENCY RESPONSE EQUIPMENT

1. EQUIPMENT LISTING

At a minimum, WESTON will maintain the following emergency response equipment on-site. Unless otherwise indicated, all emergency equipment will be stored in the site vehicle. Should any of the equipment listed below be determined no longer necessary, or should additional equipment be required, the following list will be amended accordingly.

Communications Equipment and Alarms

- Hard line telephone located in the Project office, cellular phones, 2-way radios, air horns.

Fire Control Equipment

- Two 10-pound ABC Fire Extinguishers will be on-site

Spill Control Equipment

- Spill Control Kit

Personal Protective Equipment

- Tyvek suits, hardhats, safety glasses, steel-toed boots, boot covers, hearing protection, and nitrile gloves will be on-site.

First Aid Equipment

- One medical kit, including a Bloodborne Pathogens kit per each WESTON field vehicle.

Rescue Equipment

- None anticipated for this phase.

2. EQUIPMENT TESTING

It is the responsibility of the ERC to periodically test communications and fire control equipment and to ensure that all spill response/control, PPE, and first aid supplies are available and usable.

3. Maintenance of Equipment

Fire extinguishers are to be inspected monthly with annual testing by an outside firm. First aid supplies are to be inspected weekly on construction sites and monthly otherwise. The wearer will inspect PPE prior to donning.

ATTACHMENT 3
FORMS

At a minimum the following forms will be made available on-site: Notice of Incident

- Incident Report Log (e.g., OSHA 200 Log)
- Incident Investigation Form
- U.S. Army Corps of Engineers Accident Report Form 3394
- Spill Report Form
- ERC Incident Checklists
  - General
  - Hazardous Materials
  - Fire
- Safety and Research Officer HazMat Incident Checklist and Risk Assessment Guide
- Emergency Response Coordinator Termination Checklist
- Safety Observation/Suggestion Form
- Investigators Interview Preparation Form
- Incident Observation Form

EMERGENCY RESPONSE COORDINATOR INCIDENT CHECKLIST

Nature of Incident

- Hazardous Materials Release
- Medical
- Fire
- Technical Rescue
- Other

Checklist

- Date and Time
- Command Established
- Command Post Location
- Emergency Response Coordinator (name)
- Safety and Research Support Officer (name)
- Decontamination Officer (name)
- Entry Team (names)
- Extent of Incident Identified
- Site Secured
- Evacuation Determined/Initiated
- Decontamination Setup (where necessary)
- Personnel Accounted For
- Emergency Response Teams Activated
- Internal
- External
- Medical Treatment Determined/Provided
- Control and Containment Determined/Initiated
- Release from Emergency Condition (date/time)
- Cleanup and Return to Normal Condition (date/time)
- Critique and Follow-up (date/time)

EMERGENCY RESPONSE COORDINATOR
HAZARDOUS MATERIALS INCIDENT CHECKLIST

Situation

- Spill
- Air
- Land
- Water
- Contained Within Structure
- Fire
- Leak
- Reaction
- Chemical(s) Involved
- Amount and Concentrations Estimated
- Container Types

Involving

- Fixed Location
- Transportation
- Piping
- Other
- Monitoring and Readings from Entry Team

Notifications

- Fire Department
- Hazardous Materials Response
- Police
- State
- Local
- National Response Center
- Client
- Weston Solutions, Inc.
- Other

Key Steps:

- Identify Chemical(s), Hazards and Risk
- Determine Objectives (evacuation, external response or internal control)
- Establish Command Structure
- Establish Control Zones
- Ensure Response Teams Activated
- Ensure Personnel Accounted For
- Ensure Appropriate Medical Treatment as necessary
- Ensure Proper Equipment/PPE where necessary
- Ensure Decontamination Established where necessary
- Ensure Objectives for Entry Established
- Ensure Briefing Prior to Entry
- Ensure Debriefing of Entry Team

EMERGENCY RESPONSE COORDINATOR
FIRE INCIDENT CHECKLIST

Location:

Type of Fire:

- Building/Structure
- Vehicle
- Other

Extent of Fire:

Building and Location Information:

- Type of Construction
- Sprinkler System
- Age of Structure
- Occupancy
- Contents
- Hazardous Materials

Shut-Offs and Utilities:

- Gas
- Electric
- Steam
- Pits/Sumps
- Shafts/Elevators

Water Supply (type and location)

SAFETY AND RESEARCH OFFICER
HAZARDOUS MATERIALS INCIDENT RESPONSE CHECKLIST
AND RISK ASSESSMENT GUIDE

Establish Control Zones

Research:

- Chemical(s) Identified
- Chemical Data Sheets Available
- Chemical Hazards Determined
- Major Hazards
- Physical
- Flammable
- Toxic
- Corrosive
- Reactive
- Specific Medical Treatment(s)

Amount of Chemical(s) Released or Potential for Release:

Container Types and Volumes:

Containers Stressed:

- Fire
- Reaction
- Corrosion
- Other

Exposures

- Workers
- Public
- Environmental

Protective Clothing and Equipment Required

Decontamination Established

Objectives Identified and Briefing Conducted

Entry Team Established (names/roles)

Level of Protection Established

Entry Controlled and Timed

EMERGENCY RESPONSE COORDINATOR TERMINATION CHECKLIST

Type Incident, Incident Number and Date:

On-Site Debriefing:

- Personnel Exposures/Health Effects
- Equipment Needs/Restocking Requirements
- Operations Review
- Need for Crisis Intervention Services
- Identify Contact Person for any Additional Concerns

Forms and Reports Initiated

Location of Forms and Reports

Date and Time for Debrief and Critique

Assignments for Follow-up

Investigation for Cause Initiated

Regulatory Criteria (notifications/reports) Complete

SPILL REPORT FORM

This form is to be used to report to regulatory agencies and others in the event of a release or spill. Use this form to assist in the initial report phase of an incident. Have the following information available (to the extent possible) before the call. Do not wait for information that would put you at risk of not reporting in a timely manner and in accordance with applicable regulations.

Name, Address, Telephone Number of Person Reporting.

The identity (chemical name), location and nature of the release, including its source, quantity, and duration.

Whether the release is to air, ground, or water.

Whether any injuries or property damage.

What are the weather conditions?

What types of corrective actions are underway (e.g., containment, evacuation, etc.)?

ATTACHMENT 4
SITE-SPECIFIC SPILLS or RESPONSE ACTIONS

1. Specific procedures are required of the ERC in the event of an emergency situation, these actions include:

- Activate or ensure activation of alarm systems, notify appropriate local or state response agencies.
- Identify the character, exact source, amount, and areal extent of any released material.
- Assess possible direct and indirect hazards to human health or the environment that may result from the release, fire or explosion.
- Determine if evacuation of local areas is required, and immediately notify either the government official designated as the on-scene coordinator or the National Response Center (NRC).
- Ensure that fires, explosions, and releases do not occur, recur, or spread to other parts of the site or facility.
- Monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment if facility operations cease.
- Provide treatment, storage, and disposal of any material that results from a release, fire, or explosion immediately after an emergency.
- Ensure that no waste incompatible with the released material is processed until cleanup procedures are completed and all emergency equipment listed in this plan is cleaned and fit for its intended use.

2. Evaluate the chemicals or contaminants on your site to determine whether any of the following regulatory spill reports are applicable. Fill out the necessary information in the planning phase to assure prompt and reliable reporting in the event of a spill or release. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Determine If Comprehensive Environmental Response, Compensation, and Liability Act Release:

1. Are any chemicals regulated as CERCLA hazardous substance? See 40 CFR Part 302.4). If so, list.

2. If listed chemicals indicate reportable quantity (RQ) for each.

3. In the event of a spill of the referenced hazardous substance, has the release equaled of exceeded the RQ within 24 hours?

4. Is the release totally contained within buildings or structures? If no, it must be reported.

5. If Reporting required, notify (in addition to internal/client):

6. National Response Center (800) 424-8802

   b. State Emergency Response Commission (enter phone number) _____

   c. Local Emergency Response Commission (enter phone number)_____

6. Provide information as indicated in Attached Spill Report Form.

7. Ensure written reports prepared and submitted in accordance with regulation and corporate policy.

Determine If Emergency Planning and Community Right-To-Know Act (EPCRA) Release:

1. Are any chemicals listed as extremely hazardous substances? (See 40 CFR Part 350).

2. Are any of the listed chemicals produced, used or stored in excess of the threshold planning quantity (TPQ)? If so, list chemical and quantity above TPQ.

3. Could a release of Item 2 chemicals expose people outside of the facility boundaries? If no, is not EPCRA report requirement.

4. If a release of RQ of a listed chemical, notify (in addition to internal and client):

   a. State Emergency Response Committee (enter phone number) _____

   b. Local Emergency Planning Committee (enter phone number) _____

5. Provide information as indicated in Attached Spill Report Form.

6. Ensure written reports prepared and submitted in accordance with regulation and corporate policy.

Determine If Resource Conservation and Recovery Act Release:

1. Is the chemical regulated as a hazardous waste? If not, is not a RCRA report.

2. Does the release constitute a "release, fire, or explosion that could threaten human health or the environment outside the facility? (***Note***: there are no particular RQs or concentrations in this case).

3. If the release meets the requirements of Item 2, notify (in addition to internal and client):

   a. "Appropriate local authorities" if an evacuation is necessary (list name and phone or all). _____

   b. State or Federal On-Scene Coordinator (name and phone number).

   _____

   c. National Response Center (800) 424-8802

4. Provide information as indicated in Attached Spill Report Form.

5. Ensure written reports prepared and submitted in accordance with regulation and corporate policy.

Determine If Clean Water Act Release:

1. Has the spill/release polluted water by:

   a. Being a hazardous substance (40 CFR Part 117) equaling or exceeding its RQ? If hazardous substance list and indicate RQ. *Or*

   b. Being an oil that creates a sheen or discoloration of the water surface, or violates a water quality standard?

2. If release meets the above criteria you must report to the NRC (800) 424-8802, as soon as knowledge of the spill.

3. Provide information as indicated in Attached Spill Report Form.

4. Ensure written reports prepared and submitted in accordance with regulation and corporate policy.

Determine If Toxic Substance Control Act (TSCA) Release of polychlorinated biphenyls (PCBs) (Note: determine if other TSCA reporting chemicals (e.g., asbestos) on-site):

1. Does the PCB material concentration equal to or greater than 50 parts per million (ppm) and has contaminated surface and/or drinking water, sewers, grazing lands, or vegetable gardens? *Or*

2. Does the 10 pounds or more of materials that contain 50 ppm or greater concentration of PCBs wherever they are spilled?

3. If so, then notify (in addition to corporate and client requirements)

   a. NRC immediately upon knowledge _____

   b. EPA Regional Office of Pesticides and Toxic Substances Branch (list name and phone number) _____

4. Provide information as indicated in Attached Spill Report Form.

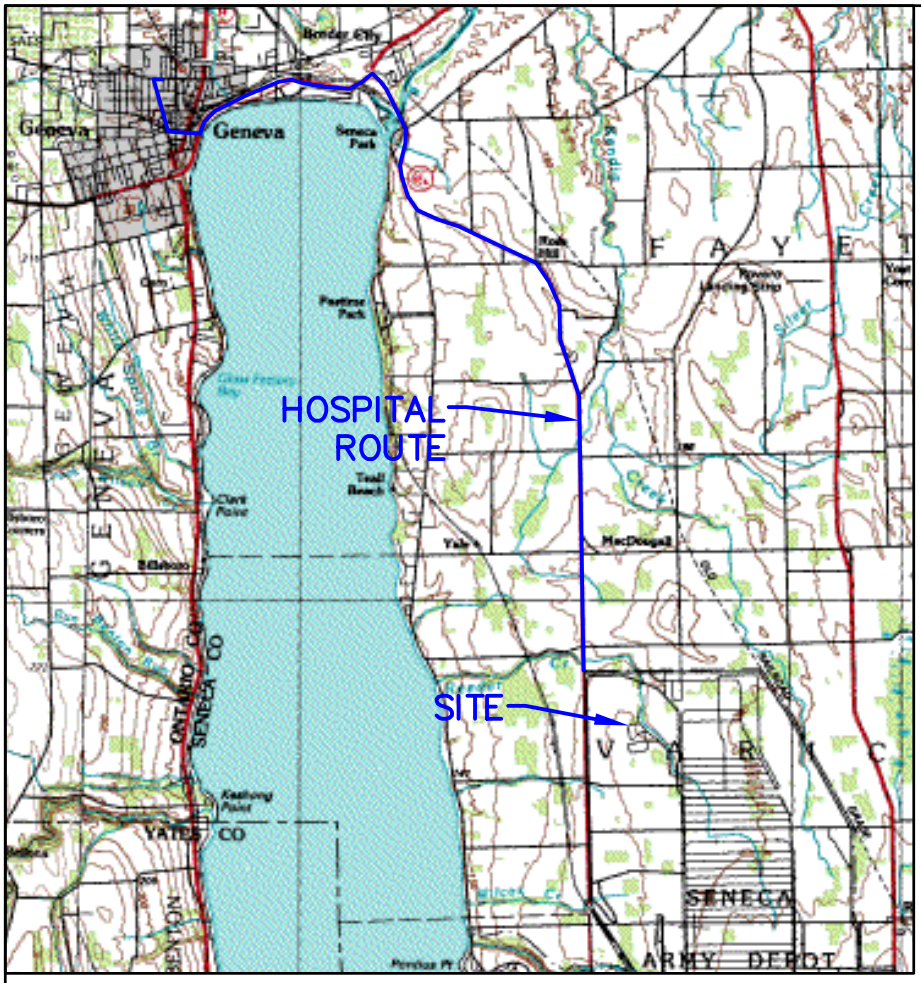
Ensure written reports prepared and submitted in accordance with regulation and corporate policy.

ATTACHMENT 5
SITE PLAN, EVACUATION ROUTES, AND EQUIPMENT LOCATIONS

A map **depicting the site, evacuation routes, and equipment locations** will be posted in the office and work site. Mobile sites will determine location on daily basis. Hospital locations will be determined from each mobile location prior to work initiation. **All personnel must be made aware of evacuation signals, evacuation routes and procedures prior to site work**. Evacuation and other site emergencies must be discussed and/or practiced to ensure employee awareness and ability to respond properly.

Hospital Route and Directions

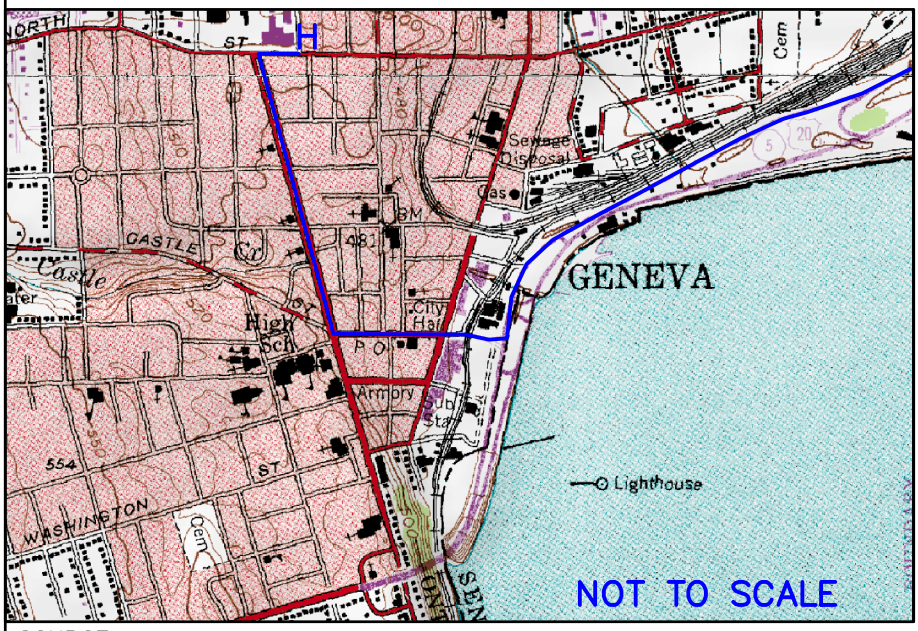
Geneva General Hospital is the closest hospital to the site. It is located at 196 North Street in Geneva, New York. Travel distance and driving time to the hospital are approximately 12 miles, 40 minutes. The attached map details the route to the hospital, and will be posted near the site telephone, and in each site vehicle. The hospital route will be verified prior to work initiation, and a written description of the route will be attached to the map.



GRAPHIC SCALE

3 1.5 0 1.5 3

APPROXIMATE SCALE IN MILES



DRIVING DIRECTIONS:

1. START OUT GOING NORTH ON NY–96A N TOWARD DEAL RD. (9.4 MI.)

2. TURN LEFT ONTO NY–5 W/US–20 W. (2.1 MI.)

3. TURN RIGHT ONTO E CASTLE ST. (0.3 MI.)

4. TURN RIGHT ONTO NY–14N/N MAIN ST., CONTINUE TO FOLLOW NY–14 N. (0.6 MI.)

SOURCE:
USGS TOPOGRAPHY MAPS; GENEVA SOUTH, DRESDEN, OVID, & ROMULUS – NEW YORK QUADS

OPEN DETONATION GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

HOSPITAL ROUTE

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DRAWN	BEG
DATE	APR 2003
FIGURE NO.	1–1

M:\Design\DWG\ACOE\SENECA\OD GROUNDS\HASP\hosp route.dwg, Layout1, 04/18/2003 04:38:04 PM, girardeb, 1:1

APPENDIX E

CONTRACTOR FORMS

DID OE-005-05.01
Attachment A

☐ QC checked by _____ Date: _____

Field Data Sheet

☐ QA checked by _____ Date: _____

Project Name: _____ **Project Location:** _____

Geophysical Contractor: _____ **Design Center POC:** _____

Project Geophysicist: _____ **Site Geophysicist:** _____

Survey Area ID: _____ **Date:** _____ **Field Team:** _____

Survey Type: ☐Grid ☐Meandering Path ☐Transect ☐Other _____

Coordinate System: ☐UTM ☐State Plane NAD _____ ☐Local ☐Other _____ **Unit of Measure:** ☐ meters ☐ feet

Sketch of Survey Area: **Approx. Scale:** _____ **North Arrow:**

_____

Terrain:
☐Level ☐Moderate Slope ☐Steep
☐Rolling ☐Ruts ☐Gullies
☐Rocky ☐Swampy ☐Dangerous

Tree Cover: **Tree Height:** ____
☐None ☐Light ☐Medium ☐Thick

Brush:
☐None ☐Light ☐Medium ☐Thick

Weather:
☐Sunny ☐Cloudy ☐Drizzle
☐Rain ☐Thunderstorms ☐Hail
☐Fog ☐Humid ☐Snow

Grid Corner Coordinates:

	UTM/State Plane	Local
SW	_____, _____	_____, _____
NW	_____, _____	_____, _____
NE	_____, _____	_____, _____
SE	_____, _____	_____, _____

	Start	End	File Name
Battery Voltage:	_____	_____	
Static Background Value:	_____	_____	_____, _____
Static Response Value:	_____	_____	_____, _____

Instrument Clock Drift: _____

Raw Data File Name: _____ **Repeat Data File Name:** _____

Geophysical Instrumentation: _____ **Serial Number:** _____

Base Station: _____ **Serial Number:** _____

Navigation Method: _____ **Serial Number:** _____

Additional Comments: _____

Quality Control Frequency & Acceptance Criteria Chart

To facilitate the detection of buried munitions, the U.S. Army Engineering and Support Center, Huntsville (USAESCH) has defined standard equipment tests and data quality. It is imperative to perform and review QC tests before carrying out production geophysical work. This ensures that the geophysical system is functioning properly and optimized for the target objectives.
The most common instruments in use today for metallic OE detection are magnetometers, and electromagnetic metal detectors. This chart identifies the minimum USAESCH required QC tests and acceptance criteria for these types of instruments.

Test #	Test Description	Acceptance Criteria	Power on	Beginning of	Beginning & Day	1st P each o	1 Lin ft. per Linear Mile	
1	Equipment Warm-up	Equipment Specific (typically 5 min)	X					
2	Record Sensor Positions	+/- 1 inch (2.54 cm)		X				
3	Personnel Test	EM61 2mV p-p, Mag 3nT p-p		X				
4	Vibration Test (Cable Shake)	Data Profile does not exhibit data spikes		X				
5	Static Background & Static Spike	Background: EM61 2.5 mV p-p, Mag 1nT p-p;			X			
		Spike : +/- 20% of standard item response, after background correction.						
6	Azimuthal Test *	Sensor Orientation that minimizes drop-outs				X		
7	Height Optimization	Maximum S/N ratio that reliably detects smallest target objective.				X		
8	6 Line Test	Repeatability of response amplitude +/-20%, Positional Accuracy +/- 20cm				X		
9	Octant Test (Heading Error Test) *	Document heading error for post-processing correction				X		
10	Repeat Data	Repeatability of response amplitude +/-20%, Positional Accuracy +/- 20cm					X	

* Magnetometer Only

Geophysical Dig Sheet and Target History

Page ____ of _____

Reacquisition Geophysical Equipment Used	Component	Serial #	Grid Background Value (mV / nT)	Date	Time

Project Name: ______________________________

Project Location: ______________________________

Date: ______________________________

Coordinate System: ______________________________

Survey Area ID: ______________________________

Sector: ________ Grid: ___________

Field Book ID: ______________________________

Geophysical Contractor: ______________________________

Project Geophysicist: ______________________________

Site Geophysicist: ______________________________

Field Team: ______________________________

COE Design Center POC: ______________________________

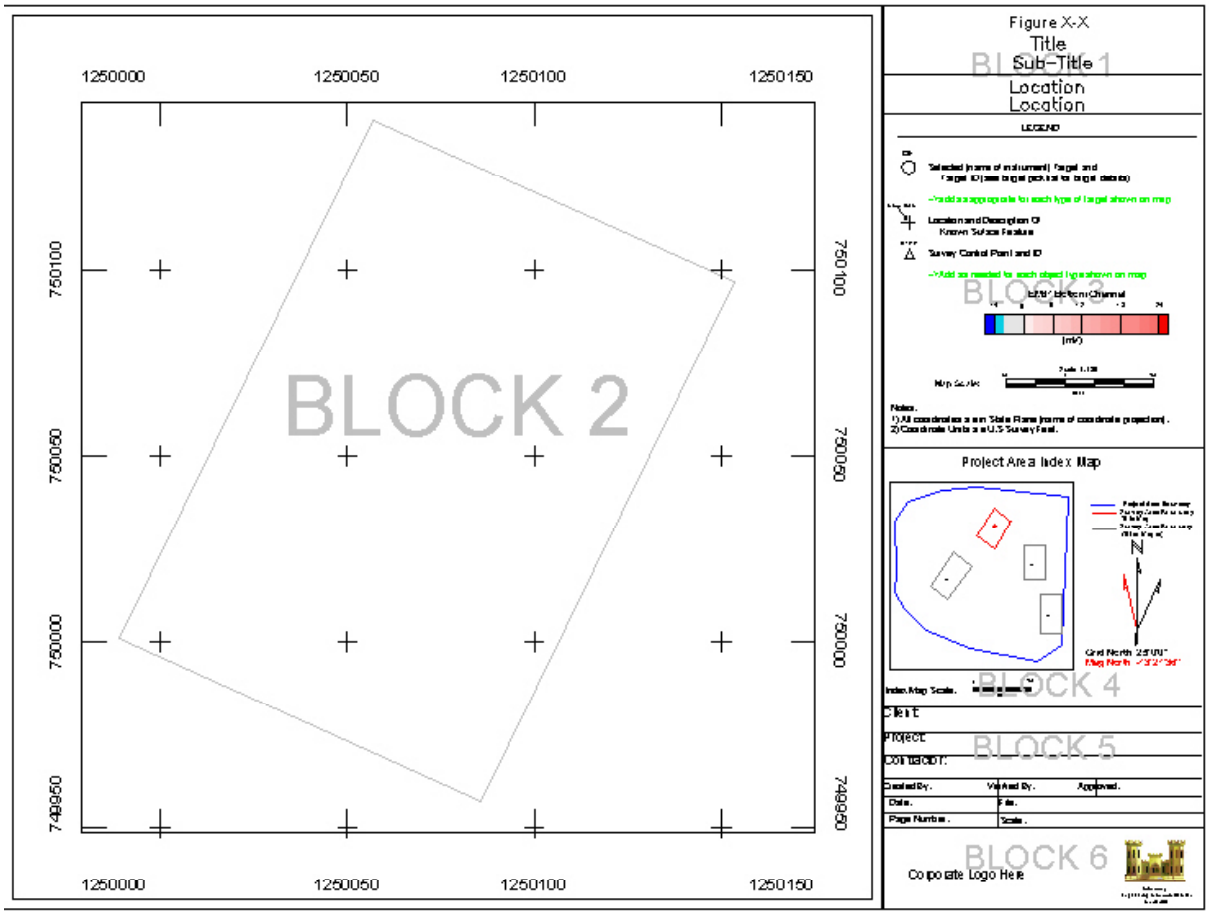
COE Project Engineer: ______________________________

COE Geophysicist: ______________________________

	Original Survey						Reacquisition Survey			Dig Results											Post-Dig UXO QC Results			Post-Dig Geophysical QC		
													Offset													
Unique Target ID	Easting Coord. (ft/m)	Northing Coord. (ft/m)	Channel ID (ie-C1 ....C4, top sensor, gradient, etc)	Response Amplitude (units*)	Dig Priority (0 is no dig-known anomaly source,1 is highest dig recommendation, etc..)	Date	Channel ID (ie-C1 or C4, top sensor, gradient)	Response Amplitude (units*)**	Date	Anomaly type ***	Approx. weight (lbs-oz / kg-g)	Comments	Distance (ft / m)	Direction (N, NE, etc.)	Orientation of Nose (Azimuth deg) **	Inclination of Nose (deg) **	Depth to Top of Item (in/cm)	Digital Photo Filename **	Date	Team Leader Initials	Excavation Hole Cleared?	UXO QC Spec. Initials	Date	Agreement between Dig Results & Geophysical Data? (G=good, P=poor, U=unacceptable)	Geophysicist QC Initials	Date

Note: *Fill in Acceptable Units (mV, nT/m, ppt, etc)
**Optional field – refer to SOW for applicability to specific project
For ***Anomaly type, use U for UXO, F for frag, OS for ordnance related scrap, S for scrap, A for small arms ammunition, NC for no contact, O for other.

Geophysical Map Deliverable Format



APPENDIX F

RESUMES

FRANCIS J. HENDERSON

Qualifications Summary

- 14 years of experience providing explosive ordnance disposal support to military, local police, fire departments, and federal agencies.
- More than four years of lead and asbestos inspection experience.

Fields of Competence

Explosive ordnance disposal management and support to military, local police, fire departments and federal agencies; conduct inspections of commercial/residential facilities to identify lead/asbestos and other hazardous materials; issue reports on findings and instruct owners on findings and abatement methods; monitor work of contractors' activities to maintain conformance to health and safety regulations and, adherence to Massachusetts, New Hampshire, EPA and OSHA standards as they apply to lead-based paint, asbestos and other hazardous materials.

Credentials

B.S., Project Management — Wentworth Institute of Technology (2000)
A.S., Environmental Engineering Technologies — Wentworth Institute of Technology (1998)
A.S., Disaster Preparedness — Community College of Air Force (1989)
Department of the Treasury-Bureau of Alcohol, Tobacco, and Firearms Manufacturer of High Explosives License (2002)
State of New York Explosives License (2002, 2003)
24 Hr. Transportation of Explosives, Department of Transportation, Transportation Safety Institute (2002)
40 Hr. Hazardous Materials Transportation, Department of Transportation, Transportation Safety Institute. (2002)
8 Hr. Hazardous Waste Operations Refresher, WESTON, (2001, 2002, 2003)
Asbestos Project Designer, Institute for Environmental Education Inc. (1997, 1999, 2001, 2002)
Asbestos Management Planner, Institute for Environmental Education Inc. (1997, 1998, 2000, 2001, 2002)
Asbestos Inspector, Institute for Environmental Education Inc. (1997, 1998, 2000, 2001, 2002)
Asbestos Project Monitor, Institute for Environmental Education Inc. (2000, 2001)
Lead Risk Assessor Refresher, Institute for Environmental Education Inc. (MA) (2002)
Lead Inspector, Institute for Environmental Education Inc. (MA) (1997)
Lead Risk Assessor (NH) (2000,2001, 2002, 2003)
40 Hr. Hazardous Waste Operations, Institute for Environmental Education, Inc. (1997)
8 Hr. Hazardous Waste Operations Supervisor, Institute for Environmental Education Inc. (1997)

Credentials (Cont.)

Environmental Field Sampling, Institute for Environmental Education Inc. (1997)
NIOSH 582 Equivalent, Institute for Environmental Education Inc. (1997)
OSHA Construction Health & Safety, Institute for Environmental Education Inc. (1997)
XRF Manufacturer Training – Niton XRF Spectrum Analyzer (1997)
XRF Manufacturer Training – RMD LPA-1Lead Paint Inspection System (1997)
Advanced Explosive Ordnance Disposal (1993)
Toxic Agent Training (1993)
Chemical Weapons Inspector/Escort Safety Course (1993)
Naval Explosive Ordnance Disposal Training (1982)

Employment History

2001-Present	WESTON
2000-2001	ALC Environmental
1997-2000	Lead Inspection/Removal Companies
1994-1997	American Protective Services
1976-1994	United States Air Force

Key Projects

UXO/Soil and Sediment Removal, Seneca Army Depot, New York, CENAE, Site Manager. Site activities included the management of ordnance and explosive (OE) removal and HTRW remediation of two site locations, 25 – 30 acres each. Task order involved surveying, sediment removal, excavation of lead contaminated soils, OE removal, soil screening, hauling, sampling and analytical, wastewater management, grading, backfilling, and site restoration services. Management included procurement of subcontractors, implementation of schedule and budget costs, cost reporting, and client coordination.

A-10 Crash Site Clean Up, Douglas, Arizona, USACE Rapid Response, UXO Safety Specialist. Site activities included search for and removal of hazardous unexploded ordnance remaining at the site of an A-10 aircraft crash. Provided safety instruction to sweep personnel on aircraft and unexploded ordnance hazards. Assisted in removal of aircraft parts from crash site for further aircraft mishap investigation.

UXO/Soil and Sediment Removal, Seneca Army Depot, New York, CENAE, UXO Safety/QC Officer. Site activities included the management and oversight of ordnance and explosive (OE) subcontractor during removal and disposal of OE from two site locations, 25 – 30 acres each. Additionally, Quality Control activities included insuring both site work and OE subcontractors performed work in accordance with the task order and applicable safety and health plans. Task order involved surveying, sediment removal, excavation of lead contaminated soils, OE removal, soil screening, hauling, sampling and analytical, wastewater management, grading, backfilling, monitoring well installation, and site restoration services. Management included procurement of explosive and blasting equipment subcontractors, implementation of schedule, and client coordination.

Key Projects (Cont.))

Explosive Ordnance Disposal, United States Air Force, Explosive Ordnance Disposal Craftsman. Provided explosive ordnance disposal support to military, local police, fire departments, and federal agencies as needed. As Team chief during range clearance operations, Nellis AFB bombing ranges, supervised team in location and disposal of unexploded ordnance. Performed quality control to insure all unexploded ordnance was disposed of. As Team chief during disposal operations of unexploded ordnance, Lackland AFB, TX, Kunsan AB, ROK, Hickam AFB, HI supervised team during open burning, and open detonation of hazardous/ unserviceable munitions and unexploded ordnance.

Inspected open burn/detonation sites to insure completeness of disposal operations. As Team chief, in place disposal of hazardous foreign ordnance Kuwait City supervised disposal under combat conditions and inspected munitions bunkers for presence of booby-trapped or hazardous ordnance items. Supported U.S. Secret service during visits of presidents, vice presidents and other designated officials. Managed administrative functions consisting of preparing written reports and other various correspondence, inventoried and maintained all classified material and prepared and submitted budget requests. Managed supply and munitions accounts; managed operations function consisting of Explosive Safety Manager, Range Safety Officer during explosive operations. Also performed as Radiation Safety Officer, and HAZMAT Emergency Response Team Leader. Managed training function consisting of preparing training objectives, prepared training classes, and instructed personnel on explosive hazards and recognition.

Surveying for the Presence of Asbestos and Lead-based Paint Various Commercial and Residential Properties, Senior Project Manager. Surveyed commercial and residential properties for the presence of asbestos and lead based paint. Prepared reports for clients based upon survey findings. Monitored the work of contractor's work for clients to include health and safety concerns, adherence to Massachusetts, New Hampshire, EPA and OSHA standards as they apply to both lead based paint and asbestos materials, and other aspects of the construction standards as needed. Prepared bid documents and specifications, scheduled work for environmental technicians, and prepared health and safety programs for clients as required. Instructor of Asbestos and Lead disciplines.

Asbestos Removal, Lead Based Paint Removal, and Selected Demolition, Project Manager. Provided costs estimates to clients for asbestos removal, lead based paint removal, and selected demolition. Interacted with clients during work to insure project technical, regulatory, cost and schedule constraints were achieved. Managed work crews performing hazardous materials waste removal operations. Hazardous waste on-site manager during removal operations; prepared health and safety plans.

Lead/Asbestos Inspections, Various Facilities, Senior Project Manager. Conducted inspections of residential/commercial facilities to identify lead/asbestos hazardous. Issued reports on findings and instructed owners on findings and abatement methods. Prepared written health and safety plans and respiratory protection programs in compliance with OSHA requirements. Monitored and reinspected work performed by contractors.

CHRISTOPHER G. KANE

Qualifications Summary

- More than 10 years of experience in private, federal, and state engineering construction projects as Project Engineer, Field Engineer, QA/QC Engineer, and Health and Safety Officer.
- Eight years of experience managing construction projects at USACE Superfund and Resource Control and Conservation Act sites involving site characterization, stabilization, soil, lagoon, and creek excavations, asbestos and lead abatement, ordnance and explosives removal, UST removals, demolition, and offsite transportation and disposal of hazardous waste.
- Responsibilities include planning, managing, supervising field work, preparing proposals, work plan submittals, change orders, cost tracking reports, scheduling and cost control, maintaining health and safety programs, monitoring quality control procedures, preparing final reports, and project closeouts.

Registration

Engineer-in-Training in the Commonwealth of Massachusetts (#14932; 1994)
Construction Quality Management for Contractors Certification, USACE (1998)

Fields of Competence

Project and construction management for environmental remediation work on projects involving site characterization, demolition, stabilization, creek excavation, soil screening, asbestos and lead removal, ordnance and explosives removal, soil, water, and explosives sampling, transportation and disposal of hazardous waste, and waste water treatment.

Credentials

B.S., Civil Engineering—Northeastern University (1992)
Certificate of Professional Achievement in Hazardous Waste Management—Northeastern University (1998)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), Hygiene Safety and Training, Inc. (1992)
8-Hour Supervisor Training, OSHA 29 CFR 1991.120, WESTON (1993)
Site Health and Safety Coordinator Course, OSHA 29 CFR 1910.120(e)(4), Perini (1993)
DOT Hazardous Waste Transportation Training, OSHA 49 CFR 172.700, Safety and Health Council of New Hampshire (1993)
4-Hour Radiation Worker Protection Training, Kerr McGee, Corp. (1993)
8-Hour Refresher, OSHA (2003)
First Aid/CPR Training (2003)
DOT and ICAO Dangerous Goods Training, 49 CFR 172.700 (1995)
American Society of Civil Engineers
Northeastern University Civil Engineering Alumni Organization

Employment History

1995-Present Weston Solutions, Inc.
1992-1995 Perland Environmental Technologies, Inc.

Employment History (Continued)

1991-1992	New England Power Co.
1990	Dufresne-Henry Consulting, Inc.
1988-1989	Stoneham Department of Public Works

Key Projects

Weston Solutions, Inc., Manchester, NH, Project Manager and Remediation Manager. Manages all aspects of site remediation, including direction of field teams and subcontractors, resource planning and scheduling, and equipment and material procurement. Supervised removal actions involving treatment and removal systems, excavation, stabilization, containment system installation, T&D of multiple waste steams, sediment removals, and O&M. As Remediation Manager, has supervised 2 Rapid Task Orders at $3.3M and 5 CR task orders valued at over $16M. Point of Contact to USACE responsible for review of SOWs; negotiation of proposals and modifications for scope changes; development of plans including work, SAP, SSHP, and QC; subcontractor procurement; and monitoring budget and schedule.

SEAD 50/54, 24, and 67 Metals Removal, Seneca Army Depot, NY, USACE-RAPID, Project Manager. Managed the sampling delineation, excavation, and disposal of over 8,000 cy of metals contaminated soil at three sites; former tank farm site, powder burning pit, and miscellaneous stockpile site. The approximate contract value was $1.4M [11-02 to 1-03; WESTON].

Former Air Force Plant No. 51 Lagoon Site, Greece, NY USACE-RAPID, Project Manager. Completed removal of lagoon sediments, soil solidification, offsite transportation and disposal of hazardous soil and water, and backfilling to restore site topography. Also managed the collection and analysis of fish fillet and fish whole body samples for human health and ecological study performed in the adjacent wetlands in Round Pond. The approximate contract value was $1.9M. [11-01 to 6-02; WESTON].

44A Function Test Site, Seneca Army Depot, NY, USACE, Project Manager. Managed the screening and hand sorting of 25,000 cy of soil to remove ordnance and explosives, coordinated onsite geophysical mapping of 25-acre site, and site restoration activities to facilitate transfer of property. The approximate contract value was $1.4M. [8-02 to 11-02; WESTON]

Open Burning Grounds Remediation, Seneca Army Depot, Romulus, NY, CENAE, Project Manager. Developed and negotiated $5.7M technical and cost proposal for soil removal project, authored planning documents and reports, tracked cost and schedule, and negotiated modifications valued at $5.0M for geophysical mapping and OE removal on 30-acre ammunition and explosives burning ground. Monitored excavation activities performed by USACE UXO subcontactor. Monitored excavation and T&D of 65,000 yd^3 of non-hazardous soils, construction of the soil treatment area, and stabilization and disposal actions for 49,000 yd^3 of contaminated soils. Oversight of excavation, dewatering, testing, and disposal of 1,000 yd^3 of sediments.

Indoor Remediation, Army Materials Testing Laboratory, Watertown, MA, U.S. Army Corps of Engineers (USACE), New England District, Assistant Project Manager. This project included chemical decontamination of over 8,000 m^3 of indoor building surfaces, which

Key Projects (Continued)

included: power washing; scabbling; grit blasting; and jackhammering existing walls, floors, and ceilings to remove PCBs, heavy metals, PAHs, and mercury. Additional remediation included abatement of over 2000 m^3 of flaking lead paint surfaces, removal of asbestos-containing materials, shock-sensitive materials testing, and removal of all appurtenances including sinks, sink traps, horizontal piping, and fumehoods within 13 buildings. Assisted with proposal preparation and work plan submittals. Responsible for oversight of all on-site activities including: management of WESTON employees (Quality Control Officer, Project Engineer, Equipment Manager, Health & Safety Officer, sampling technicians, and crew leaders) and a labor force of over 70 union personnel; subcontractor procurement and supervision; coordination of weekly progress meetings for cost and schedule control; daily communications with the contracting officer's representative; and closeout including preparation of a final closeout report. The approximate contract value was $9.6 million.

Asbestos Abatement, Providence, RI, USACE, Project Manager. Responsible for containment, removal, and disposal of more than 580 linear ft of nonfriable asbestos-containing building material (ACBM) floor tiling within the basement and first floors of the J.H. Harwood Building. Daily PCM samples were collected and TEM clearance was performed by a RI-licensed industrial hygienist. Management included procurement of subcontractors, implementation of schedule and budgets, cost reporting during abatement, regulatory and client coordination, State of Rhode Island reporting, and project closeout activities. Project was performed within schedule and under budget. Approximate contract value was $85,000.

Outdoor/Indoor Remediation, Watertown Arsenal, Watertown, MA, USACE, Site Manager. This project involved outdoor remediation consisting of site layout, test pitting at six locations to depths of 3 and 4 feet within a 50- by 50-ft area to determine concentrations of TPH and RCRA metals, excavation of 280 yd^3 of contaminated soil to a 3-ft depth, removal of 60 ft of granite curbing, 120 linear ft of concrete sidewalk, and removal of 134 yd^3 of bituminous paving; backfilling, compaction, and geotechnical testing of soils; banking and seeding; and transportation to and disposal of contaminated soil at an approved TSDF. Indoor items included testing drain traps and sinks/piping for TCLP silver and mercury, and removing and disposing of all material as construction debris. Performed all procurement, scheduling, and site management of site work activities. Project was performed within schedule and under budget. Approximate contract value was $106,000.

Underground Storage Tank Removals at Various USACE Facilities in New England, USACE, Site Manager/Project Manager. A total of five USTs at Brockton, MA; Lawrence, MA; Springfield, MA; and Middletown, CT were removed under the Massachusetts Contingency Plan. The tanks ranged in size from 500 gallons to 12,000 gallons. All residual oil was sampled and analyzed for characterization and disposed of at a licensed tank disposal yard/disposal facility. Performed all regulatory coordination, permitting, site management, preparation of a Remedial Action Outcome Statement and Closure Report, and closeout activities. Project was performed within schedule and under budget. Approximate contract value was $94,000.

Blue Beach Disposal Site Remediation, North Kingston, RI, USACE, Site Manager. Project involved test pit excavation following STOHLS subsurface investigation at former Quonset

Key Projects (Continued)

Point Naval Base Station; laboratory sampling and characterization of stockpiled soils; segregation of subsurface metal debris; containment and staging of 18 drums of waste oil and sludge; transportation and disposal of two 30-yd^3 rolloff containers to a nonhazardous landfill; and site restoration, including backfill. Performed site supervision, subcontractor management, and project closeout. The project was performed under budget. Approximate contract value was $240,000.

Devil's Foot Site Remediation, North Kingston, RI, USACE, Site Manager. Project involved clearing and grubbing of 0.5-acre plot; concrete pad and footing demolition and removal; location of buried utilities using ground-penetrating radar (GPR) survey; test pit excavation at 48 locations and field test kit analysis for TPH; pumping and removal of recharge water; laboratory sampling and characterization of TPH-contaminated soil; excavation, transportation, and disposal of more than 2,000 yd^3 of TPH-contaminated soil to a permitted treatment, storage, disposal facility (TSDF); and site restoration. Managed all site activities, supervised subcontractors, and performed all quality control inspections. Project was completed within schedule and under budget. Approximate contract value was $300,000.

Demolition and Asbestos Abatement, Davis Barn Site, North Smithfield, RI, USACE, Site Manager. Project involved demolition, removal, and disposal of a dilapidated building following the containment and abatement of all friable asbestos-containing insulation from the boiler room at this barn and from the Longwood Pump Station. Performed all site supervision and subcontractor management. Contract value: $88,000 (completed within schedule and under budget).

Remediation of Barnum Road Maintenance Yards, AOCs 44 and 52, Fort Devens, MA, U.S. Army Corps of Engineers (USACE), Site Manager. Construction activities on this 8-acre CERCLA site involved excavation, backfilling, and compaction of 31,000 cubic yards (yd^3) of surface soils; on-site asphalt batching of 11,600 yd^3 of cPAH- and TPH-contaminated soils; and installation of more than 2,500 linear ft of drainage piping. Supervision of sampling and characterizing overpacked drums, asphalt paving 38,000 yd^3 of binder and surface course, and installation of a detention pond for surface runoff. Responsibilities included managing quality control; engineering and health and safety staff; supervising site subcontractors, maintaining USACE, base, and subcontractor contact/relationships; issuing field memos; monitoring asphalts; tracking project quantities for schedule; and developing monthly status reports for USACE submittal items. Project was completed under budget and within schedule. Approximate contract value was $3 million.

Kerr-McGee Superfund Site, West Chicago, IL, EPA, QA/QC Engineer/Health and Safety Officer. This project site was used as a manufacturing plant that produced thorium-based tailings. The material was stored on-site and used as a disposal area. Responsible for the installation of concrete foundations, building platforms, slabs, and walls for a railcar loading facility. The loading facility consisted of a facilities loading ramp, earthworks conveyor system, and monitoring platforms for the material transition stages. A 1,000-ft-long sheetpile wall was constructed to contain soil containing the radioactive material. Project was completed on schedule and within budget. Approximate contract value was $6 million.

Key Projects (Continued)

Rose Township Superfund Site, Holly, MI, U.S. Environmental Protection Agency (EPA), Project Engineer. This former disposal area contained PCB and lead contaminated soil. Responsible for remediation efforts including: excavation and incineration of 33,000 yd^3 of soil; stabilization and landfilling of lead-contaminated and thermally treated soil; soil vapor extraction of soil above the groundwater table to the excavation limit; groundwater treatment; and off-site disposal of TSCA/RCRA waste. Other activities included monitoring well installation, air stripping tower retrofitting, and drum sampling efforts. Approximate contract value was $18 million.

Tybouts Corner Landfill Superfund Site, Tybouts, DE, EPA, Field Engineer. Responsible for overseeing the installation of a 40-acre landfill involving clay capping operations, gas vent well installations, perimeter monitoring well installations, and water treatment building installation. Project was completed under budget and on schedule. Approximate contract value was $4 million.

Dunbar Brook Structure, Florida, MA, New England Power Co., Field Engineer. This 40-year-old structure was used to divert the Dunbar Brook during peak flows from the surface runoff. Responsible for coordinating the demolition of wing walls, spillway platforms, gate structures, and access platforms to retrofitting the structure with 1,000 yd^3 of concrete. The intermediate tasks involved stabilization of upstream riverbanks and dredging of intake areas. Approximate contract value was $1.5 million.

STEVEN R. KIREJCZYK

Qualifications Summary

- More than 3 years in the environmental field.
- Experience in soil sampling, and sampling protocols
- Extensive experience in industrial hygiene standards, occupational safety and health affairs.
- Experience assisting in the management of construction projects with labor force consisting of union and non-union personnel.

Fields of Competence

Marine Safety and Environmental Protection; environmental impact assessment; heavy equipment operation; sampling.

Credentials

B.S., Marine Safety and Environmental Protection Massachusetts Maritime Academy (1998)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFRR 1910.120(e)(3), Massachusetts Maritime Academy (1996)
Fire Fighting Training School, Massachusetts Maritime Academy (1994)
2-Hour Lead Awareness, 29 CFR 1926.62(1)(I)(ii), WESTON (1999)
Bloodborne Pathogens Refresher Training, OSHA 29 CFR 1910.120(e)(8), WESTON, (2000)
Confined Space Training for NON-ENTRY Rescuers, 29 CFR 1910146, WESTON (1999)
NITON XRF Spectrum Analyzer Training, NITON, 1999
10-Hour Construction Safety training, 29 CFR 1926, WESTON (1999)
American Red Cross First Aid Training, WESTON (2000)
Construction Quality Management, U.S. Army Corps of Engineers (USACE) (1999)
American Red Cross CPR Training, WESTON (2000)
Site Health and Safety Coordinator Course, OSHA 29 CFR 1910.120(e)(4), WESTON (1998)

Employment History

1998-Present	WESTON
1997-1998	Clean Harbors (Winter)
1997	Cyn Environmental (Summer)

Key Projects

Construction Activities, Western Berks Water Authority, Reading Pennsylvania, Equipment Operator. This project involved the backfilling of and old clarifier with crushed stone. Responsible for equipment operation in the backfilling procedure. Equipment included bulldozers, rollers and excavators.

Key Projects (Continued)

SEAD 50/54, 24, and 67 Metals Removal, Seneca Army Depot, NY, USACE-RAPID, Site Safety and Health Officer/Survey Technician. Responsible for delineating excavations in field, collecting samples, maintaining line and grade using GPS unit, tracking samples in data base, supervising the removal of over 8,000 cy of metals contaminated soils from former tank yard site.

44A Function Test Site, Seneca Army Depot, NY, USACE, Site Safety and Health Officer. Supervised the excavation and processing of 25,000 cy of soil. Maintained effective safety program in accordance with Work Plans, Explosives Safety Submission to ensure all workers were conforming to local, state, and federal regulations.

Open Burning Grounds Remediation, Seneca Army Depot, Romulus, NY, CENAE, Sample Technician. Responsible for the delineation, collection, storage, and tracking of all soil, water, air samples at the Open Burning Grounds site Metals Removal project. Collected over 400 samples as part of the metals removal project.

Remediation Activities, Eastland Woolen Mill Superfund Site, Corinna ME, USACE, Site Health and Safety Officer. This project involved the building of a bridge in order to build a road to divert Main Street and commence Remediation of soils. Responsibilities included implementation of the health and safety program, and to insure safe working practices were followed during the construction of the bridge.

Remediation Activities, Zeneca, Inc., Dighton, MA Equipment/Treatment Plant Operator. This project included the draining, excavation, processing of water in the treatment plant, and backfilling of three ponds contaminated with PCB's. Responsibilities included operation of the site wastewater treatment plant, and operation of heavy equipment. Equipment included Bulldozer, front-end loader, and excavator.

Soil Remediation, Seneca Army Depot, Romulus, NY, CENAN, Sample Supervisor, Vendor Tracking. This project included the excavation and stabilization of 35 acres of lead/copper contaminated soil for property transfer. Responsibilities included shipping, tracking and sampling of 60,000 tons of soil, pads and berms of open burning grounds, creek sediment, ppe and concrete. Also conducted vendor relations by ordering materials and writing requisitions and modifications.

Soil Remediation, South Jersey Gas, Glassbororo, NJ, Equipment Operator/Laborer. This project included the excavation, disposal, incineration, and backfilling of a site which was contaminated by fuel oils. Responsibilities included demolition of a building, heavy equipment operation, and general site activities.

Key Projects (Continued)

Soil Remediation, New Cumberland Military Warehouses, New Cumberland, PA, Heavy Equipment Operator. Project included the excavation, and backfilling of soil which was contaminated by Trichloroethylene. Responsibilities included heavy equipment operation and general site tasks. Equipment included Bulldozers and excavators.

Site Contamination Investigation, Pittsfield, MA, USACE, New England District, Environmental Technician. Performed extensive PCB sediment sampling on the Housatonic River.

Landfill Closure, Confidential Client, Laurens, SC Laborer/Equipment Operator. This project included the clear cutting and closure of a 2.5 acre industrial landfill. Responsibilities included laying down bentonite fabric, installing silt fence, and grading activities for landfill closure.

STEFFANIE M. WARRINER

Qualifications Summary

- Over 3 years of related experience in environmental engineering.
- Field experience includes: sampling, monitoring, and analysis of soil, air, surface water, and groundwater; and surveying
- Experience in report preparation including: completion reports; task work plans; SSHASPs; QAPPs; ECWMPs; Proposals; and RFPs.
- Data analysis and statistical interpretation.
- Preparation of air and wastewater permit applications
- Waste management and minimization at pulp mills.
- Laboratory testing and analysis.

Registration

Engineer-in-Training in the State of New Hampshire

Fields of Competence

Report preparation (Work Plan, Health and Safety Plan [HASP], Completion Report, Environmental Protection Plan [EPP], Contractor Quality Control Plan [CQCP], Quality Assurance Project Plan [QAPP], Field Sampling Plan [FSP]); environmental sampling and analysis; hazardous waste site investigations and remediation; air sampling and monitoring during remediation activities; and compliance evaluation.

Credentials

B.S., Civil/Environmental Engineering—University of Alberta (2000)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), WESTON (2001)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2002)
8-Hour Site Managers and Supervisors Training, OSHA 29 CFR 1910.120(e)(4), WESTON (2001)
10-Hour Construction Safety and Health Course, OSHA 29 CFR 1926, WESTON (2001)
Confined Space Entry for Non-Entry Rescuers, OSHA 29 CFR 1910.146, WESTON (2001)
Dangerous Goods Shipping Procedures Manual Training, WESTON (2001)
Hazardous Waste Management and Shipping for Environmental Professionals, WESTON (2001)
CPR/First Aid Training and Refreshers, American Red Cross (2002)
Bloodborne Pathogens Training and Refreshers, OSHA 29 CFR 1910.1030, WESTON (2002)
Workplace Hazardous Materials Information System Training (WHMIS) (1997)
Bilingual Certificate in French (1994)

Employment History

2001-Present	WESTON
1997-2000	University of Alberta (Co-Op Student Engineer)
1999-2000	Northwood Pulp, Inc.
1998	Canadian Waste Services

Employment History (Continued)

1997 Northwestern Utilities

Key Projects

Non-Time Critical Removal Action (NTCRA), Eastland Woolen Mill Superfund Site, Corinna, ME, U.S. Army Corps of Engineers (USACE), New England District (CENAE), Assistant Engineer. Prepared the completion report for 1999 demolition activities. Conducted air sampling and monitoring during remedial construction and building demolition. Provided support during design and construction of the Low Temperature Thermal Treatment (LTTT) system. Prepared the work plan, EPP, site-specific health and safety plan (SSHASP), and CQCP for on-site LTTT. Analyzed sample results, and performed various statistical and trend analyses during pilot testing of the LTTT system. Helped author the LTTT Pilot Study Completion Report.

Monthly Raceway Monitoring, Lawrence, MA, Confidential Client, Field Assistant. Assisted with monthly surface-water sampling and monitoring for polychlorinated biphenyls (PCBs), data analysis, and report preparation.

Peroxide Injection Monitoring, and Sample Collection, Former Regalite Plastics, Upper Newton Falls, MA, Poly One, Assistant Engineer/Field Lead. Conducted air monitoring and oversight during peroxide injection treatment, and performed post-injection water sampling and parameter monitoring using low-flow sampling techniques.

Environmental Permitting, Portsmouth, NH, Confidential Client, Assistant Engineer. Assisted with conducting an inventory of all potential air emissions (current and anticipated) to ensure that the client would be compliant with permit regulations during future facility expansions. Assisted client with preparation of a wastewater permit application for the facility.

Sampling, Housatonic River Site, Pittsfield, MA, CENAE and U.S. Environmental Protection Agency (EPA) Region I, Assistant Engineer. Assisted with sediment sampling for PCB contamination in the Housatonic River.

Quarterly Sampling/Groundwater Analysis, Tier 1A Massachusetts Contingency Plan (MCP) Site, Burlington, MA, Confidential Client, Assistant Engineer. Assisted with quarterly sampling and analysis of groundwater.

Sampling, Nyanza Chemical Waste Dump Superfund Site, Massachusetts, USACE (CENAE/ EPA), Assistant Engineer. Assisted with routine soil/sediment sampling.

Alternative Methodologies for Cumulative Assessment, University of Alberta, Research Assistant. Researched and proposed alternative methods for assessing cumulative effects under the Canadian Environmental Assessment Act (CEAA).

Environmental Engineering Co-Op, Prince George, British Columbia, Northwood Pulp, Inc., Student Engineer. Responsibilities included: monitoring and assessing the on-site sludge compost project; testing and assessing wastewater; identifying current and future process waste

Key Projects (Continued)

management initiatives; air quality testing; on-site landfill management; implementation of a mill-wide recycling program; and document preparation.

Environmental Engineering Co-Op, City of Edmonton, Alberta, Canada, Canadian Waste Services (Municipal Landfill), Student Engineer. Responsibilities included surveying assistance; waste, leachate, and soil sampling; and support for Environmental Engineering Manager.

Publications and Presentations

Warriner, S. 2001. "Alternative Methodologies for Cumulative Assessment." Presented at the University of Alberta Dean's Research Award Assembly. Alberta, Canada.

JOHN A. WILLIAMS, JR.

Qualifications Summary

- Twenty-eight years of professional experience.
- More than 20 years of experience in geological and geophysical investigations, including subsurface profiling with GPR, electrical resistivity (ER) and EM conductivity, TDEM, magnetics, VLF, SP, shallow seismic refraction, magnetotelluric, GPS techniques for numerous private industry, municipal, and state and federal facilities.
- Twenty years of experience in analysis, interpretation, integration, and reporting of geological and geophysical data; and 6 years of experience in bathymetric, hydrographic, and aquatic biological studies.

Registration

Certified Ground-Penetrating Radar (GPR) Operator, Geophysical Surveys Systems, Inc. (GSSI) (1987)
OASIS UX-Detect Data Processing, Geosoft Inc. (2001)

Fields of Competence

Geological and geophysical investigations; geological and groundwater sampling techniques and instrumentation technology; design, operation, and evaluation of geophysical survey equipment; testing and analysis of aquifers and groundwater pollution; and remedial investigations/feasibility studies (RI/FSs).

Experienced in several computer software programs for processing geophysical data, including GSSI-RADAN3, EM-DAT31/34/61, MagMap, Geosoft (OASIS/UX-Detect), and Trimble Pathfinder.

Credentials

B.S., Earth Science (Geology)—West Chester University (1983)
A.S., Marine Technology—Cape Fear Technical Institute (1975)
Graduate Studies, Geophysics—West Chester University (1988-1989)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), WESTON (1985)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2003)
Bloodborne Pathogens Training, OSHA 29 CFR 1910.1030, WESTON (2003)
Project Management Training, WESTON (1993)
Short Course in Theory and Field Application of Magnetotellurics Methods in Hydrogeological Investigations, University of Berkley Field Campus (1996)
Theory and Practice of Applying Subsurface Interface Radar Technology in Engineering and Geological Investigations, GSSI Facility (1987)
Short Course, OASIS montaj UX-Detect Software for UXO Data Analyses, Geosoft Inc., UXO Countermine Conference (2001)
Environmental and Engineering Geophysical Society

Employment History

1982-Present	WESTON
1980-1982	Environmental Resources Management, Inc.
1977-1980	WESTON
1976-1977	Highway Service Marineland
1975-1976	Lawler, Matusky, Skelly Engineers

Key Projects

Geophysical Investigations Seneca Army Depot, N.Y., U.S. Army Corps of Engineers (USACE), New England District, Rapid Response, Lead Geoscientist. Worked closely with CENAB and CEHNC geophysicists on developing Type II Work Plan relative to CEHNC Data Item Descriptions (DID). Responsible for QA of geophysical subcontractor data acquisition and reporting relative to all aspects of CEHNC DID requirements.

Geophysical Investigations Fort Dix, N.J., U.S. Army Corps of Engineers (USACE), Baltimore, Lead Geoscientist. Participated in TTP session to design geophysical investigations using time domain electromagnetic (TDEM), and magnetometry (MAG) techniques at Fort Dix to identify potential buried ordnance and ordnance related items. Worked closely with CENAB and CEHNC geophysicists on developing Type I Work Plan and project geophysical QC requirements relative to CEHNC Data Item Descriptions.

Geophysical Investigations Various Sites Spring Valley, D.C., U.S. Army Corps of Engineers (USACE), Baltimore, Lead Geoscientist. Conducted geophysical investigations using TDEM, and MAG techniques at more than 25 sites to identify buried ordnance waste pits and trenches. Worked closely with CENAB and CEHNC geophysicists on developing project geophysical QC requirements relative to CEHNC Data Item Description (DID) requirements. Performed analyses of raw and post processed data, prepared interpretive geophysical plots, target summaries, reports and presented results at on board review meetings.

'New Techniques for Precisely Locating Buried Infrastructure' Project, Various Locations, American Water Works Research Foundation, Lead Scientist. The project required the use of electromagnetic (EM) and sonic and acoustic (S&A) instruments and ground penetrating radar (GPR). Responsibilities included coordination of field evaluation, workshop presentations, data analyses, interpretation, and reporting.

Geophysical Investigation, Shenandoah Road Groundwater Contamination Site, East Fishkill, NY, EPA, Region II START, Lead Geoscientist. Conducted geophysical surveys to better characterize general structure (conductive/resistive zones) in the shallow bedrock along the Shenandoah Ridge using Very Low Frequency (VLF) profiling and Electrical Imaging using Earth Resistivity (ER) methods. The objectives were to provide structural information about the bedrock and overburden on the north portion of the ridge and better locate and delineate fault and joint surfaces, which facilitate the transport towards the main valley. (These fracture zones represent high-yield zones that the drillers were likely seeking when they were installing the residential wells.) The information obtained from this investigation was used to 1.) Further develop the site conceptual model, 2.) Provide focus for the RI activities and optimize the placement of

Key Projects (Continued)

proposed monitoring wells, 3.) Better understand the migration pathways of PCE to the various locations where it was detected and 4.) To provide structural information to better determine if the easternmost fault acts a hydraulic barrier, keeping contaminated water from migrating beyond the Precambrian block.

Geophysical Investigation, U.S. Air Force (USAF) Lajes Airfield, Azores, Portugal, Lead Geoscientist. Designed and implemented magnetotelluric (MT) surveys to image hydrogeologic characteristics adjacent to the airfield's water supply wells. All of the supply wells drew their water from a deep basal aquifer system under the island. Over-pumping and saltwater intrusion were identified as potential contributors to elevated drinking water quality standards. The objectives of the MT surveys were to image the suspended and basal aquifers in regard to variations in the thickness and location the freshwater/saltwater (transitional) zones. Additional structure such as fractures and faults were identified. Responsible for analyses, interpretation and reporting of data. Results were used to map well field stratigraphy, identify seawater intrusion zones, and fresh water recharge zones to locate future production wells.

Geophysical Investigations at Various Sites, U.S. Army Corps of Engineers (USACE), Baltimore, Geophysicist. Conducted geophysical investigations using ground-penetrating radar (GPR), electromagnetic (EM), and magnetometry (MAG) techniques at 5 facilities. At APG, MD, conducted GPR and EM investigations to identify buried ordnance waste pits, buried process lines, and buried septic systems at several sites. At Morgantown Energy Technology Center (METC) Morgantown, WV, conducted GPR and EM investigations to identify a potential buried chemical waste pit, and a buried process line at two sites. At Lower Saddle River, NJ, conducted GPR, EM, and MAG investigations to characterize a buried waste area for a flood control project.

Geophysical Investigation for Unexploded Ordnance (UXO), Aberdeen Proving Ground (APG), Edgewood Area, MD, N-Field Site, Coordinator. The objective of the investigation was to locate and map MAG and EM anomalies (indicative of potential ordnance and/or related anomalies) at depths of approximately 2 to 8 feet below ground surface (bgs). WESTON conducted both electromagnetic (EM-61) and magnetic (G-858) surveys. Surveys were conducted using a dense sampling interval to obtain the high resolution necessary to detect significant anomalies. A total of 109 anomalies requiring further analysis and visualization were selected from these plots. Data were used to construct the geophysical anomaly summary tables. Potential "discrete" ordnance locations were derived in state planar coordinates for the 109 selected anomalies. Reacquisition activities were conducted in March 2000. Results were used to identify and remove significant munitions-related items that could potentially impact site construction activities proposed at the site.

Subsurface Imaging, Washington Navy Yard, Washington, DC, Geophysicist. Used GPR and EM to locate underground storage tanks (USTs), associated piping, and other potential utilities/assets. A geographic information system (GIS) database was developed, which included asset codes, characteristics, and ID confidence ratings for mapping the features. Assets were color-coded and plotted on GIS site facility maps.

Key Projects (Continued)

Site Investigation (SI), West Virginia, Confidential Client, Lead Project Geologist. Conducted soil boring, rock coring, monitor well installation, groundwater sampling, and installation of long-term monitoring (LTM) instrumentation for water balance and containment characterization. Conducted Hydropunch groundwater sampling and heated headspace analysis, using gas chromatography (GC), for on-site screening of methyl ethyl ketone (MEK) in groundwater. Additional responsibilities included data management, interpretation, and presentation.

Geophysical Investigation, Fullco Wood Treatment Facility, Alabama, EPA Region IV, ERT, Project Coordinator/Field Team Leader. Coordinated and supervised field crews conducting seismic refraction, EM terrain conductivity (EM-31 and EM-34), very low frequency (VLF), and spontaneous potential (SP) to determine bedrock configuration and the presence of weathered or fractured zones in the shallow subsurface. Additional responsibility included data analysis and interpretation, and report preparation.

Geophysical Investigation, Riverbank Army Ammunition Plant (RBAAP), Riverbank, CA, USACE, Lead Project Scientist. Conducted a preliminary geophysical investigation using GPR and MAG to characterize the disposition of waste materials as part of a site assessment. Data from the study located the boundaries of a former landfill.

Base Realignment and Closure (BRAC) Soils Investigation, 15 Military Facilities in the States of Connecticut, New York, and New Jersey, and Commonwealths of Massachusetts and Virginia, Argonne National Laboratory (ANL), USACE, Under Contract to U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), Field Team Leader. Coordinated and supervised a three-person field crew conducting soil boring, surface soil, and sediment sampling for geological, hydrogeological, and contaminant characterizations at 15 sites, including housing and commissary areas and Nike sites. Responsible for data management, interpretation, and report preparation.

Enhanced Preliminary Assessment (PA), Massachusetts, Fort Devens, USACE, Under Contract to USATHAMA, Project Geologist. Performed property characterizations to identify and characterize "areas requiring further environmental evaluation" associated with historical and current uses, with emphasis on physiography, geology, hydrogeology, and sensitive environments, and the effects related to human and environmental receptors. In addition, served as project geologist for enhanced PAs conducted at Fort McClellan, Alabama, and the Kansas Army Ammunition Plant, Kansas.

Groundwater Assessment, Newark, OH, Owens Corning Landfill, Project Geologist/Field Team Leader. Conducted field investigations for hydrogeological SIs pertaining to a permit to install application. Provided interpretation of geological conditions and hydrogeological regime in the underlying aquifer.

Geophysical Investigation, Virginia, Fort Myer, USACE, Baltimore District, Lead Project Scientist. Conducted a preliminary geophysical investigation using GPR to characterize the disposition of waste materials as part of a site assessment pertaining to a proposed construction

Key Projects (Continued)

project. Data from the GPR study located a lobe of the former sanitary landfill under the proposed construction area.

SI and RI/FS, Naval Weapons Station (NWS) Earle, Colts Neck, NJ, Northern Division (NORTHDIV), Naval Facilities Engineering Command (NAVFAC), Lead Project Geologist. Coordinated and supervised a field crew conducting soil borings, monitor well installations, Hydropunch sampling, and groundwater, surface water, and sediment sampling for geological, hydrogeological, and contaminant characterizations at 25 waste disposal sites. Conducted and supervised aquifer slug testing. Member of project Technical Review Committee (TRC) responsible for reporting to NORTHDIV, EPA Region II, and the New Jersey Department of Environmental Protection (NJDEP). Additional responsibilities included data management, data interpretation, and preparation of work plans and reports.

RI/FS, NWS Yorktown, Yorktown, VA, Atlantic Division (LANTDIV), NAVFAC, Lead Project Geologist. Conducted preliminary geophysical investigations, including the use of GPR and EM to characterize the disposition of waste materials at eight sites. Coordinated follow-up activities and supervised a field crew conducting soil borings, monitor well installations, Hydropunch sampling, aquifer slug testing, tidal and groundwater monitoring, and groundwater, surface water, and sediment sampling for geological, hydrogeological, and contaminant characterizations at 16 waste disposal sites. Conducted and supervised aquifer slug testing. Member of project TRC responsible for reporting to NORTHDIV, EPA Region II, and NJDEP. Additional responsibilities included data management, data interpretation, and preparation of work plans and reports.

Publications

Williams, Jr., John A, et al. 2001. "New Techniques for Precisely Locating Buried Infrastructure." *American Water Works Research Foundation.*

APPENDIX G

GEOPHYSICAL PROVE-OUT WORK PLAN

DRAFT
WORK PLAN
GEOPHYSICAL EQUIPMENT PROVE-OUT

Geophysical Mapping Services
Open Detonation Grounds Site
Seneca Army Depot Activity
Romulus, New York

Prepared For:

U. S. Army Corps of Engineers
Huntsville Center
Mandatory Center of Expertise & Design Center
Ordnance and Explosives
And
U. S. Army Corps of Engineers
Omaha District

Prepared By:

Parsons

1700 Broadway
Denver, CO 80290

April 2003

Table of Contents

1.0 INTRODUCTION

Parsons intends to perform site characterization as part of an ordnance and explosives (OE) removal action at former Seneca Army Depot, Romulus, New York. As a part of this effort, a site-specific geophysical prove-out (GPO) analysis is needed to determine the geophysical methods and location techniques that can be used to perform site surveys and meet project goals. This GPO Work Plan discusses the approach to conducting surveys and the prove-out grid analysis.

2.0 GEOPHYSICAL PROVE-OUT OBJECTIVES

The objectives of the site-specific geophysical prove-out at Seneca are to:

- Determine the capabilities of the geophysical towed array in locating buried metallic items simulating UXO under anticipated site conditions.
- Verify that Parsons can incorporate sensor data with a locating system in a timely manner.
- Ensure that 95 percent of all reacquired anomalies lie within a one meter horizontal radius of their mapped surface location as marked on the dig sheet.
- Verify the ability of Parsons to transfer data to Weston in a timely and efficient manner.

3.0 SURVEY EQUIPMENT

3.1 Location Equipment

The GPS consists of 24 U.S. Department of Defense satellites that travel approximately 11,000 miles above the earth's surface and complete full orbits twice a day. The satellites broadcast radio wavelengths containing data that are collected by GPS receivers. A computer and the proper software allow GPS receivers to determine extremely accurate positions on earth.

The Trimble GPS Total Station 5700™, a modular, real-time kinematic (RTK) survey system with one centimeter accuracy, will be used for finding the positions of the prove-out grid corners and the positions of the prove-out grid items. These GPS units are small and lightweight (2.7 pounds) with an integrated GPS receiver and radio modem. A Trimble 4000 base station receiver situated at a known location will be used to communicate via radio signals with the rover receiver set to the same frequency.

3.2 Geophysical Instruments

The geophysical survey instruments selected for testing on the prove-out grid based on the initial screening matrix prepared in Section 2 are the following:

3.2.1 EM61-MK2 (TDMD) The EM61-MK2 coils generates an electromagnetic pulse that triggers eddy currents in the subsurface. The eddy current decay rate produces a secondary magnetic field that is monitored by a receiving coil and recorded by an attached data logger. The system receives the signal in two receiving coils at two separate heights above the ground surface. A distance of 40 centimeters separates the lower and upper coils. The EM61-MK2 data logger collects data at automatic time intervals determined by the user or at a pre-programmed distance interval measured by an attached set of wheels with all-terrain tires.

3.2.2 Schonstedt® GA-52Cx The Schonstedt® GA-52cx is a fluxgate-type passive ferrous metal detector. It is the most common metal detector used by UXO personnel during intrusive operations. The GA-52Cx uses an audible tone to indicate the intensity of the magnetic signal. The Schonstedts do not digitally record geophysical or global positioning data and are thus called "analog" geophysical instruments.

3.2.3 White Metal Detector The White All Metals Detector is an EM metal detector that detects both ferrous and non-ferrous metal objects.

4.0 SURVEY PROCEDURES

4.1 General

A Parsons geophysical survey team, consisting of a geophysicist and a geophysical team member, will operate the towed array system over the GPO grids, as well as test the GPS equipment. The following sections describe procedures specific to each instrument survey.

4.2 Global Positioning System

The objectives of the location survey are to determine the accuracy of the GPS and to determine the ability of the GPS to maintain signal and accurate positioning while traversing on the prove-out grid. The GPS system will be tested daily over a known survey point to verify the accuracy before any surveys begin.

The GPS will also be evaluated in conjunction with the geophysical equipment to demonstrate its applicability to provide positional information during anomaly acquisition and re-acquisition. Depending on the geophysical instrument system, the GPS data and geophysical data may be recorded in the same or separate instruments. In either case, the data are merged and New York State Plane coordinates are assigned to each geophysical data point.

4.3 Geophysical Surveys

The prove-out will consist of individual surveys at each of the three GPO test grids. The processed data will be evaluated for anomaly detection with GPS data to determine the positional accuracy over the items with known coordinates.

As previously stated, a GPS system will be evaluated for collecting positional data in the prove-out plot for data acquisition and re-acquisition.

4.3.1 EM61 Towed-Array - In order to map large areas of open pasture or field, Parsons plans to use a towed array of EM61-MK2 metal detectors as the primary mapping technique. The proposed array configuration consists of the following components:

- an all-terrain vehicle (ATV or GATOR) to tow the instrument coils and carry a driver, computer, power source (12-volt storage batteries), EM61-MK2 electronics and global positioning system (GPS) electronics,

- three EM61-MK2 instrument coils separated by a lateral distance of 3 feet with synchronization ports will be fastened together with non-metallic parts such as fiberglass and plastic bolts, and supported using sets of the EM61 wheels,

- a Trimble RTK GPS, or equivalent, using a fixed based station and a rover antenna mounted over the center of the EM61 array, and a laptop computer to simultaneously record data from the three EM61-MK2 coils and the GPS system.

5.0 EQUIPMENT AND DATA ACQUISITION

5.1 Towed Array Description

The EM61-MK2 will be selected for geophysical mapping at Seneca is based on the results of a geophysical instrument prove-out and geophysical mapping conducted at Seneca and other similar sites such as Camp Howze, Camp Sibert, Camp Blaine, and Fort Ord. The EM61-MK2 is a four-channel time domain metal detector. A transmitting coil transmits a pulsed electromagnetic signal that generates subsurface eddy currents. When the primary signal is terminated, a secondary signal is induced within conductive bodies. Receiver coils detect the intensity of the transient secondary signal, which decays at a rate dependent on the conductivity of the subsurface environment. The EM61-MK2 measures the response decay rate in a conductor by integrating the voltage induced in the receiver coils over four different time gates.

Data from four channels corresponding to four time gates will be recorded to provide a more complete measurement of the response decay rate for improved target characterization. The decay rate is a complex function of the conductivity, magnetic permeability and shape of the target, so analysis of the decay rate could allow discrimination of the subsurface metallic items. Early time gates enhance the detection of smaller targets; a mid-range time gate (channel 3), is the same time gate used for the standard EM61 and is useful for comparative analysis. The EM61-MK2 provides a rate of data collection of 12 records per second with four channels per record.

Data collection will be performed using three EM61-MK2 sensors separated by 3 feet in a towed array configuration. The towed array system is integrated with a GPS and towed with an ATV. The geophysical towed array will consist of three Geonics EM61-MK2 units using 1.0 x 0.5 m coils towed approximately 15-feet behind the tow vehicle.

A Trimble 5700 RTK-GPS, capable of sub-centimeter accuracy, will be used to acquire positional information in conjunction with geophysical data. The RTK-GPS system will use

a base station situated at a nearby known point, which transmits positioning information to the rover GPS mounted on the top center coil of the EM array.

The data from each unit will be transferred to a field computer on the tow vehicle. In addition to the EM61-MK2 data, the Trimble 5700 RTK GPS system will also be connected to the field computer. The data will be logged using commercial software. This software allows a real time display of the EM61-MK2 data and the positioning information from the GPS system as well as provides audio and visual warnings if any of the sensors are not functioning.

5.2 Data Acquisition

The data will be collected by towing the system over the grid in a manner such that overlapping "swaths" of data are collected over the site. The software used for data logging allows monitoring of the signals from the EM61-MK2 as well as the GPS output, so that a constant assessment of the state of the instruments can be made. The software provides by audio and visual warnings of instrument problems, such as drop-out of GPS signal. These warnings prevent the collection of data that doesn't meet data quality requirements.

The ATV towing the system will carry two personnel so that one person can view the data logging PC screen and the other can drive the vehicle. To ensure that overlapping coverage is obtained over the entire grid, the vehicle can navigate through several methods including:

- Observing tracks of previous lines and offsetting the new line to obtain overlapping coverage, or
- Using cones at either end of the lines to line up the vehicle, or
- The use of spray paint to mark the positions of lines and then offsetting the new lines.

Using GPS data from antennas based on the trailer has not proven to be an effective method of navigating the array, since the offset between the tow vehicle and GPS antenna is too large.

Once the data is collected, the data will be transferred to the processing computer using an Ethernet connection for rapid data transfer.

6.0 DGM QUALITY CONTROL CHECKS

Quality Control (QC) checks will be conducted for geophysical instruments at specified intervals. The QC checks monitor the instruments for noise, stability, repeatability as well as collect useful information needed for data processing. Table 6.1 lists the various tests along with the test frequency. The checks may be performed at the Test Strip or at the survey area.

Table 6.1: DGM QC Test Frequency

Test Description	Applicable Instruments	Power On	Beginning of Day	End of Day	1st Day of Project for Each Operator	1 Line per Grid
Equipment Warm-Up	All	**X**				
Record Sensor Positions	All (fixed on some instruments)		**X**			
Personnel Test	All		**X**			
Vibration Test (Cable Shake)	All		**X**			
Static Background and Static Spike	All		**X**	**X**		
6-Line Test	All				**X**	
Repeat Lines	All					**X**

6.1 Equipment Warm-Up

The purpose of this test is to minimize sensor drift due to thermal stabilization. Most instruments need a few minutes to warm-up before data collection begins. Follow the manufacturer's instructions or, if none are given, observe the data readings until they stabilize. Generally, most instruments stabilize within 5 minutes. Instruments that require long times may indicate problems. This procedure should be followed each time the instrument is powered (i.e. at the start of the day, after breaks, etc.).

6.2 Record Sensor Positions

It is important to document the relative positions of the instrument sensors and their height off the ground. For some instruments, the sensor positions are fixed and documentation is not required unless the instrument is known or suspected to be non-standard. For instruments with adjustable sensors, the sensor positions should be recorded at the start of each day. In the case of GPR, the center frequency of the antennas should be recorded; sensor height and position is not applicable.

6.3 Personnel Test

For the personnel test, the instrument is set up and turned on at a location where the operator and those working within proximity of the instrument can move close to the sensors. The response of the instrument is monitored for any interfering metal that may be present. Common sources of metal are pens, boots, and belt buckles. In general, the EM61 should remain within 2 mV of background and magnetometers within 3 nT of background. This test is performed at the beginning of each day in an area generally free of anomalies and interference.

6.4 Vibration Test (Cable Shake)

This test checks the instrument for cable and connection problems. With the instrument held in a static position and collecting data, shake all cables to test for shorts and connectors to test for bad connections. Cable problems generally require replacing the cable. Connections can sometimes be fixed by cleaning or simply by reconnecting. Data collected while conducting the vibration test should show no spikes or variations.

6.5 Static Background and Static Standard Response (Spike) Test

The purpose of this test is to record the instrument background readings, monitor for electronic drift, identify potential interference, and determine the impulse response and repeatability of a standard item. A standard 2" diameter steel trailer ball is the preferred test item. The test is conducted by holding the instrument static and measuring the local background (without the standard item present) for about 3 minutes. Next, the standard item is placed on the ground under the instrument sensor where a maximum reading is obtained and an additional 1 minute of data are collected. The item is removed and a final minute of data is collected. Review of the data should indicate static background readings within 2.5 mV for the EM61 and within 1 nT for the G-858. Readings for the standard item should be within 20% of the original readings after subtraction of baseline response. For GPR, this test can be used to verify that a standard metallic item produces a recordable response. Improper instrument function, ambient electromagnetic noise, and instability in

the earth's magnetic field during a magnetic storm are all potential sources of inconsistent, non-repeatable readings. The test should be conducted in an area free of anomalies and interferences.

6.6 Six Line Test

At the beginning of the field-mapping program, each instrument operator will log six traverses. The first two record "background" data up and back along a single 50 ft traverse. The next two are a set of traverses (up and back) over a standard item (trailer hitch ball) on the ground at the 25-foot (halfway) mark. The final set of traverses will simulate surveying up and down hills. The operator will first log data traveling at a slow pace (simulating an uphill traverse) and then return at a significantly more rapid pace (simulating a downhill traverse). The response of the standard item should be repeatable within 20% and the positional accuracy of the resulting impulse spike should be within 20 cm.

6.7 Repeat Data

The repeatability of the geophysical data is monitored by repeating the collection of a line of data. Generally, a line is established at least 10 feet outside the grid parallel to the direction of travel of the grid. A standard item (trailer hitch ball) is placed at the halfway point in an area without anomalies. The line is recorded at the beginning of data collection and at the end. The amplitude of the standard item responses should be within 20% and the location accuracy should be within 20 cm. For instruments with larger measurement footprints such as the EM31, the location accuracy should be proportionally larger.

6.8 Analog Instrument QC Checks

Analog geophysical instruments, such as the Schonstedt GA-52Cx, will be checked at the start and end of each day by operating the instrument over the Test Plot with metallic test items. The sensitivity of the instruments will be verified by monitoring the audio responses to the buried objects are various distances. At the start of each day, each operator will be checked for interfering metallic items by scanning with the instrument. The battery will be checked and the instrument will be shaken to check for loose parts and bad electrical connections. The performance of these tests will be documented in field books or on standard forms.

7.0 DATA PROCESSING, CORRECTIONS, AND ANALYSIS

7.1 Initial Field Processing

Downloading using the software provided with each instrument. Post-processing for EM and magnetometer surveys will primarily involve ensuring that the survey lines were

correctly recorded with respect to their survey direction, distance, and grid coordinates. Post-processing particular to each instrument is described below.

When used in conjunction with geophysical instruments while conducting DGM surveys, the GPS instruments record positions at regular intervals, usually one record per second. Each record has coordinates and a time stamp. Preprocessing involves synchronizing the GPS data stream with the geophysical instrument data. When properly merged, accurate location coordinates are provided for each geophysical data point.

7.2 Standard Data Analysis

After post-processing and the data review is complete and the data are backed up on disk and computer, the geophysical data from the surveys will be processed into ASCII space-delimited files. The data will be presented in delineated fields as "X", "Y", and "Z", where "X" and "Y" are the UTM Coordinates in Eastings and Northings and "Z1, Z2, …" are the instrument readings. The last data field should be a time stamp. The data will then be transferred into processing software and the locations and magnitudes of the geophysical signals will be plotted on plan-view maps. A raster image will be used to produce an anomaly map that identifies the locations of the anomalies.

The data will then be transferred into raster image software (i.e. Geosoft) where geo-referencing to the UTM Coordinate system, leveling (adjusting to a common baseline), gridding, plotting and target analysis will be performed and the locations and magnitudes of the geophysical signals plotted on maps. A raster image will be used to produce an anomaly map that identifies the locations of the anomalies. The data will processed in the following ways, as needed:

- extra or erroneous data will be deleted, such as instrument run-ons at the ends of grid lines, data with incorrect values, etc.
- values will be added to or subtracted from lines of data, sections, or entire grids, to shift background to be near zero millivolts.
- the following processing steps will be done as needed: corrections for latency, drift, reading error, sensor offset.

Upon completion of the DGM, a Parsons geophysicist will interpret the data. The USAESCH geophysicist will be provided with both the raw and any processed data in digital format daily. A "readme.doc" text file will be transmitted with the raw field data file explaining all processing that was performed on the data and detailing any peculiarities identified by geophysical field personnel. The results of the interpretation will be a list of geophysical anomalies that could be potentially buried UXO items.

A table listing the buried items, the buried depth, and if the item was detected will be provided to Weston for the proveout grids where the location and nature of the buried items are known. An analysis will be made of the positional inaccuracies over these proveout grids as well. For the proveout grids where there are items of unknown location and size, a listing will be provided of the locations of all the interpreted buried items and the anomaly amplitude associated with them.

During the field investigation Parsons recommends that a small test strip be located closer to the areas where equipment will be stored overnight to greatly reduce the time spent traveling back and forth to the test grid. Parsons recommends that the test strip be relocated adjacent to the storage building.

8.0 DATA INTERPRETATION

Upon completion of the geophysical surveys, a Parsons geophysicist will interpret the data and document all stages of the processing. Both the raw and processed data will be provided to Weston in digital format no later than 36 hours after the data are collected. A Microsoft Word™ file will be transmitted with the raw field data file explaining all processing that was performed and detailing any peculiarities identified by geophysical field personnel. The results of the geophysical survey will be presented to the on-site Weston representative and will include an interpretation by the geophysical team of the location of actual buried seed items in the prove-out grid.

9.0 DATA DOWNLOADING AND PROCESSING

All data collected in the field will be stored electronically on a field laptop computer. Data from the surveys will be downloaded from the data loggers at regular intervals to ensure that the work performed will not be interrupted by a lack of storage capacity in the data loggers.

9.1 Data Post-Processing

The data collected with the geophysical instruments will be post-processed in the field after downloading using software provided by the manufacturer with each instrument (i.e. DAT-61, Magmap2000, Trimble Pathfinder and Trimble Survey Office). Post-processing for the surveys will primarily involve ensuring that the survey lines were correctly recorded with respect to their survey direction, distance, and grid coordinates. GPS positioning data will also be merged with the geophysical data when GPS has been used.

9.2 Data Interface and Analysis

After post-processing and all quality control procedures have been followed, the data will be backed up on disk and the geophysical data from the surveys will be exported into ASCII delimited files. The data will be presented in delineated in fields as "X", "Y", and "Z1, Z2,…", where "X" and "Y" are the local State Plane Grid Coordinates in Eastings and Northings and "Z1, Z2,…" are the instrument readings for the coils/sensors collecting simultaneous data. The data will then be transferred into Geosoft® Oasis Montaj software. This software consists of a graphical user interface, a high volume database, and a cross-section of built-in data import, processing, analysis, visualization, mapping, and integration capabilities. The Geosoft Platform allows a processor to edit maps interactively, apply dynamic linking to maps, and track the map creation process. Visual data links are used to connect data in the spreadsheet, profile and map views.

For the EM data, instrument latency corrections and leveling of the data to a common baseline will be performed as necessary. A non-linear filter will also be applied to the data as necessary to remove data spikes.

After all processing steps, raw data and filtered/processed data will be viewed in profile form over top of one another to clearly see the affect the filtering and processing had on the original data. After processing is complete, gridding, using the minimum curvature method, and contouring of the data will be performed in preparation for anomaly selections. The minimum curvature method fits a minimum curvature surface to the data points. A minimum curvature surface is the smoothest possible surface that will fit the given data values and settings.

10.0 QUALITY CONTROL

Quality control will be established for the geophysical and location surveys by performing the following:

1. Static instrument tests will be performed to determine instrument drift. This typically involves keeping the instrument in a fixed position while recording and monitoring for drift of the signal due to the instrument. At the end of this test, the cables will be shaken gently to verify that noise is not being introduced due to loose connections in the cables.

2. A standard response will be established for each geophysical survey instrument using a standard metallic item. The geophysical equipment will be checked over the test item at least three times daily and readings documented and analyzed for data repeatability and consistency.

4. The GPS survey equipment will be checked over a known point at least two times daily (beginning and end of each day) and the readings will be documented and analyzed for repeatability and consistency.

Baseline QC of each instrument will be performed by establishing a 150 ft transect at the prove-out grid that is surveyed with each system. Each instrument will be operated along the QC transect six times in the following manner:

1. Normal speed from 0 to 150 ft, no QC item on transect.

2. Normal speed from 150 to 0 ft, no QC item on transect.

3. Normal speed from 0 to 150 ft, QC item on transect.

4. Normal speed from 150 to 0 ft, QC item on transect.

5. Fast pace from 0 to 150 ft, QC item on transect.

6. Slow-pace from 150 to 0 ft, QC item on transect

The results of the QC transects will be evaluated for the proper function of the instruments. The data from the QC transects will be transferred to Weston and an analysis included in the technical report.

11.0 TECHNICAL REPORT

Parsons will provide a technical report describing all elements of the prove-out investigation, including:

- Site Conditions
- Equipment

- Procedures
- Methods
- Personnel
- Data Processing and Interpretation
- Quality Control
- Results
- Recommendations for instruments and techniques to be used for site geophysical surveys and anomaly reacquisition.

12.0 SCHEDULE

The prove-out is tentatively scheduled for April 2003, following the approval of the site-specific geophysical test prove-out work plan by Weston and USAESCH.

APPENDIX H

GEOPHYSICAL PROVE-OUT LETTER REPORT

Mr. Chris Kane
Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19280

Re: Geophysical Prove-Out Report for Proposal on Geophysical Mapping Services. USACE: Omaha District Rapid Response Open Detonation Grounds (ODG) Site, Seneca, Army Depot, Romulus, New York, Prime Contract No. DACA45-98-D-0004

Dear Mr. Kane:

The purpose of this report is to inform you of the geophysical prove-out results of the surveys performed at the Seneca Army Depot between April 24 and 25, 2003.

INTRODUCTION

As part of the proposal process for the Seneca Army Depot Activity Open Detonation geophysical survey proposal, Parsons was required to demonstrate the ability to use an EM61-MK2 towed array for the detection of buried ordnance items. The geophysical prove-out was conducted on the afternoon of April 24, 2003 by a crew of three persons from Parsons. The prove-out was conducted over three different prove-out grids: The Q (East) area prove-out grid, the South prove-out grid and the West prove-out grid. The Q area prove-out grid had been used previously by Parsons as part of the EE/CA conducted at the site. The grid contained several items that were buried by Parsons and additional items buried by the COE. The location of these items was known to Parsons, and this data was used to evaluate the positioning and noise level produced by the array.

The South and West prove-out grids contained items that had previously buried by the COE and Parsons had no knowledge of the location or nature of the items buried. This report contains a summary of the results obtained from the data collected using the Parsons towed array over these prove-out.

OBJECTIVES

The primary objective of the geophysical prove-out were to achieve the following:

- Demonstrate the capability and effectiveness of the Parsons EM61-MK2 towed array to locate buried simulated unexploded ordnance (UXO) items under anticipated conditions at the site.

- Verify conformance of the geophysical instruments with DID OE-005-05 (Geophysical Investigation Plan) in regards to the anomaly depth detection criteria.
- Verify the ability of the contractor (Parsons) to transfer data (including raw geophysical data) to USAESCH.

GEOPHYSICAL SURVEY EQUIPMENT

Three EM61-MK2 systems were attached together using structural fiberglass and plastic items. The goals in the construction of the array were the following:

- Rigid construction to reduce the motion of the coils relative to each other thereby reducing noise.
- Use material that is as light as possible while still providing the strength required.
- Use a design that is easily towed by a small off road vehicle, while maintaining enough distance from the tow vehicle to minimize any electronic noise from the vehicle.

The array was designed with a coil spacing of three feet. However, the ability to change the spacing to 2.5 feet was developed in case the system was unable to detect all the previously detected items in the "Q" area prove-out grid.

The EM-61 device generates an electromagnetic pulse that triggers eddy currents in the subsurface. The eddy current decay rate produces a secondary magnetic field that is monitored by a receiving coil. These secondary magnetic fields are received as data and stored in a data logger until it can be downloaded to a personal computer (PC) for interpretation. The EM-61 double coil system receives the signal in two receiving coils at two separate heights above the ground surface. The upper and lower coils are separated by a height of forty centimeters giving separate measurements. The EM-61 data logger collects data at automatic time intervals determined by the user (up to about twelve times per second) or at a pre-programmed distance interval measured by an attached set of wheels with all terrain tires.

The EM61-MK2 uses a 0.5 x 1.0 m coils and records data from either the top coil and three different time gates from the bottom coil or four different time gates from the bottom coil. The latter mode was used for the proveout. The data stream for each sensor was streamed to the logging software over serial cables. The use of the logging software described below allows the logging of the data at rates up to 16 Hz. For this proveout, the data was logged at a rate of 12 hz.

GLOBAL POSITIONING SYSTEM EQUIPMENT

A Trimble 4700 RTK DGPS (differential GPS) was used to position the array. A GPS antenna was placed on a tripod above the center coil and connected to the electronics located in the back of the Gator. The Trimble 4700 RTK DGPS system is an integrated parallel channel GPS receiver with a built-in radio-modem communication system. A dedicated base station broadcasts real-time differential corrections to the rover units being used by the field crew. Positional data in the GGK format was output to the logging computer at 1-s intervals using a serial cable.

LOGGING SYSTEM

The logging system used was Geometrics Maglog™ software running on a laptop held by the operator. The laptop was equipped with an adaptor to provide four serial ports to log the data from the three EM61s and the RTK GPS system. The logging software provides several functions. They include:

- Streaming of raw data to hard disk. This is the first task of the software and takes priority over everything else.
- Display of results in graphical format so that the operator can have a real time analysis of the equipment functioning.

The logging software puts a time stamp from the computer on each data reading from every sensor. The time stamp is derived from the computer clock and so it is independent of the clocks on the EM61 and GPS electronics. This removes the requirement for synchronization of EM61 and GPS clocks and removes any effects of drift on the EM61 clocks.

TOW VEHICLE

The tow vehicle employed for this survey was a John Deere Diesel Gator 4x6 off road vehicle (Gator). This vehicle provides:

- adequate space for all the required electronics,
- two seats so that a driver and an operator can both be in the vehicle,
- selection between 2 or 4 wheel drive,
- diesel motor for electromagnetically quiet operation.

GEOPHYSICAL SURVEY PROCEDURES

DATA ACQUISITION

The data were collected towing the array back and forth across the proveout grid until complete coverage had been obtained. During this time, the operator is solely

responsible for monitoring the displays on the laptop, no other input is required from the operator once data logging has started.

The logging software provides a real time display of the position of the GPS antenna located above the array, however, this is difficult to navigate with because of the distance between the antenna and the tow vehicle. For this survey, a paint spray marker was used to mark the lines. The driver uses the marks on the ground from the previous line to navigate the vehicle to ensure that full coverage is obtained over the entire survey grid. The lines were spaced approximately 10 feet apart, approximately the width of the entire array.

At the start and end of the surveying a static test was conducted to verify the operation of the instruments. Data was recorded from the array while it was stationary. Subsequently a 2-inch trailer ball was placed under a coil in the array and additional data recorded. The ball was then moved to a location under the next coil and data recorded again. This was done for all three coils. This verifies that the instruments are responding to a test item, and ensures that the sensors are connected to the correct serial ports on the computer so that they can be positioned correctly.

Before and after data acquisition on each grid, the array was run back and forth over an aluminum bar. This provides a measurement of the instrument latency. The latency can then be determined by finding a correction value that results in overlapping peaks over the bar when the instrument is run from different directions.

DATA DOWNLOADING AND PROCESSING

Maglog creates a separate data file for each sensor (3 EM61 files and 1 GPS file), plus additional files that provide information on the individual lines within the data file as well as data on the instruments that were to collect the data. These files were transferred to the processing computer using an Ethernet cable.

A total of three data sets were collected during the field effort for this prove-out: One for each proveout grid. All of the data were imported into Geometrics *Magmapper2000*™ software for preprocessing. Magmapper reads in all the data and displays the track of the GPS antenna and profile plots of the selected channels from the EM61 sensors. The offsets to the center of each coil from the GPS antenna are entered into Magmapper and then the data is exported into Geosoft XYZ format. Three XYZ files are created by Magmapper, one for each sensor in the array. Each XYZ file contains data for each channel recorded by the respective sensor as well as the position of the sensor based on the location of the GPS antenna and the offset distance for the sensor.

All data sets were processed using Geosoft's *Oasis Montage*™ software. Individual Geosoft databases were created for each proveout grid surveyed. The EM-61 data were processed with the following procedures:

- Conversion from WGS84 latitude and longitude to NAD 83 New York Central state plane coordinates.

- Latency correction using the values derived from the lag bar tests conducted before and after each survey. Typically a 0.3-s latency correction was used.

- Drift correction using the Geosoft UX-Detect drift correction algorithm. Parameters used for this correction were a block size of 100 points, and removal of the bottom 1 percent and top 70 percent of the data. The drift correction was performed on all four channels.

- Gridding using 0.5-ft grid node spacing and a blanking distance of 2-ft.

RESULTS

The grids for each proveout area were displayed on a map along with the track maps showing the position of each sensor. Maps with the grids displayed are shown in Figures 1 through 3 for the East, South and West prove-out grids respectively. The known locations for the buried items in the East proveout grid are also shown in Figure 1. These locations have been corrected for the corner locations obtained by Weston during the proveout. The original locations, determined during the January, 2000 OE EE/CA Geophysical Proveout (Report on Geophysical Equipment Test Prove-Out, Parsons, June, 2000), were obtained by pulling tape from corner locations surveyed in using a Trimble ProXRS with sub-meter accuracy. The locations plotted on Figure 1 were calculated using the more accurate corner locations. Because the original corner distances for the COE buried items were not available, an approximate shift in position was obtained using the difference between the original and improved corner locations, but their locations were not used in the detection analysis.

The automated picks made using the montaj UX-Detect algorithm are included in an ASCII file in Geosoft ASCII format on the enclosed CD. The files are called East_picks.xyz, South_picks.xyz, and West_picks.xyz for the East, South and West grids respectively.

QUALITY CONTROL

INTRODUCTION

Quality control for the Seneca Depot Activity geophysical prove-out data was maintained by performing three types of QC procedures: 1) static tests, 2) instrument latency tests over a static bar and 3) positional quality checks over known item locations.

STATIC TESTS

Static tests the EM-61 towed array were performed by holding the array stationary and recording data with and without a test item under each coil. This resulted in four separate tests conducted at the beginning and end of the day. The test object consisted of a metal 2-inch trailer hitch ball and data were collected for approximately 3 minutes in each instance. The static tests were executed prior to beginning each survey and at the conclusion of the prove-out surveys. The static test at the beginning of the day showed on the order of $\pm$ 0.5 mV of noise, while there was a slightly increased amount of noise ($\pm$ 1.0 mV) at the static tests conducted in the evening near the West prove-out grid. The increase in noise was interpreted to be due to the presence of an active power line near the West grid.

INSTRUMENT LATENCY CHECK

A latency test was conducted before and after data acquisition on each grid. The test was conducted by acquiring data while traveling at right angles over an aluminum rod in opposite directions. An instrument latency correction was applied using the DOD QA/QC module in Oasis Montaj. Use of the correct latency value results in overlapping peaks when traveling in opposite directions.

POSITIONAL CHECK

A positional check was conducted by comparing the location of an anomalies picked in the East proveout grid data with the known locations of the OE simulants buried in the grid. This analysis displayed on Table 1 indicates an average positional error of approximately 1.0 ft, which is expected based on the 3.28-ft width of the EM61-MK2 coil.

CONCLUSIONS AND RECOMMENDATIONS

Buried simulated UXO items were detected using the EM61-MK2 towed array conducted by Parsons at three different prove-out grids located at the Seneca Storage Depot Activity.

The results of this study show that the EM61-MK2 towed array was capable of acquiring data with a low noise level and high positional accuracy. The towed array data appeared to provide better results than a handpulled EM61 survey. The data met the requirements as specified in the DID OE-005-05 (Geophysical Investigation Plan)

Based on these results we recommend that the towed array be used over the open burn/open detonation area as constructed for the geophysical prove-out testing.