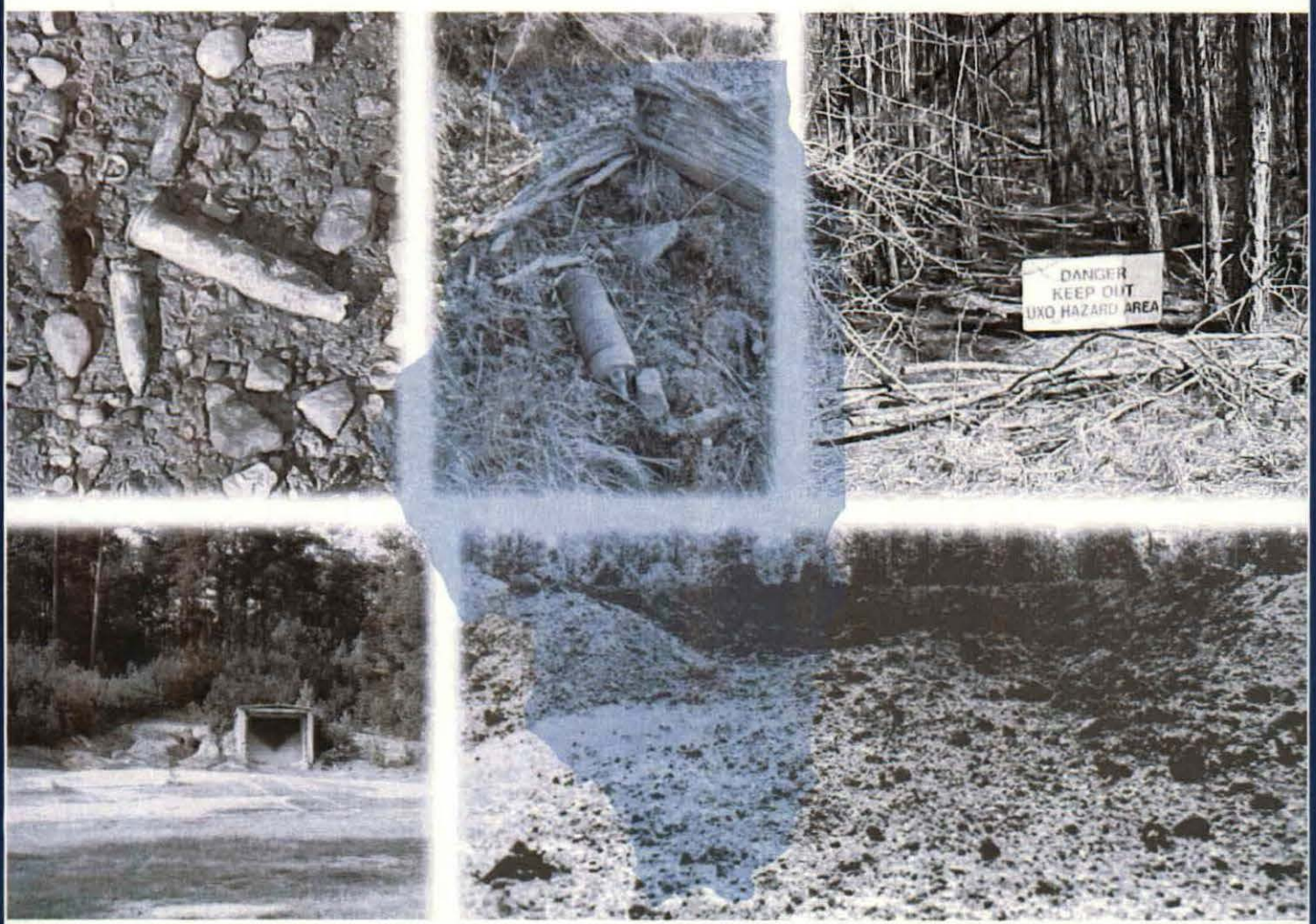
FINAL WORK PLAN MUNITIONS RESPONSE SITES FORT SHERIDAN IL

3/1/2006

USAEC

Final
Work Plan
Fort Sheridan, Illinois

Military Munitions Response Program
Site Inspection
Munitions Response Sites



March 2006

FINAL
WORK PLAN
MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
MUNITIONS RESPONSE SITES

FORT SHERIDAN, ILLINOIS

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Contract Number DACA-45-02-D0010
Task Order 0003

MARCH 2006

SIGNATURE PAGE

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FORT SHERIDAN, ILLINOIS

MARCH 2006

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ACRONYMS

AAA	Anti-Aircraft Artillery
ACGIH	American Conference of Governmental Industrial Hygienists
AEDB-R	Army Environmental Database - Restoration
amsl	Above mean sea level
AOC	Area of Concern
AR	Administrative Record
ARID	Army Range Inventory Database
ASR	Archive Search Report
BBP	Bloodborne Pathogens
bgs	Below ground surface
BRAC	Base Realignment and Closure
CD	Compact Disc
CENWO-CT	USACE, Omaha District Contract Officer
CENWO-PM	USACE, Omaha District Project Manager
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COC	Contaminants of Concern
CPR	Cardiopulmonary Resuscitation
CRREL	Cold Regions Research and Engineering Laboratory
CSM	Conceptual Site Model
CTC	Cost to Complete
CTT	Closed, Transferring and Transferred
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DID	Data Item Description
DMM	Discarded Military Munitions
DoD	Department of Defense
DoDD	Department of Defense Directive
DQCR	Data Quality Control Reports
DQM	Data Quality Manager
DQOs	Data Quality Objectives
DSA	Diane Short and Associates, Inc
e^2M	engineering-environmental Management, Inc
EBS	Environmental Baseline Survey
ECAS	Environmental Compliance and Analysis Services

ACRONYMS

EM	Electromagnetic
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ERIS	Environmental Restoration Information System
FPM	Field Project Manager
FSARC	Fort Sheridan Army Reserve Complex
FSP	Field Sampling Plan
ft	Feet
ftp	File Transfer Protocol
FUDS	Formerly Used Defense Sites
GIS	Geographic Information System
GPS	Global Positioning System
H&S	Health and Safety
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBV	Hepatitis B Virus
HIV	Human Immunodeficiency Virus
HRR	Historical Records Review
HTRW	Hazardous, Toxic and Radioactive Waste
Hz	Hertz
IEPA	Illinois Environmental Protection Agency
IRP	Installation Restoration Program
kg	Kilogram
LCS	Laboratory Control Sample
MC	Munitions Constituents
MDL	Method Detection Limit
MEC	Munitions and Explosives of Concern
mg	Milligram
mg/kg	Milligram/kilogram
mm	Millimeter
MMRP	Military Munitions Response Program
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
MRS-PP	Munitions Response Site – Prioritization Protocol
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSDS	Material Safety Data Sheets

ACRONYMS

NFA	No Further Action
NSDI	National Mapping and National Spatial Data Infrastructure
OE	Ordnance and Explosives
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA	Preliminary Assessment
PM	Project Manager
PMP	Project Management Plan
POC	Point of Contact
ppb	Parts per billion
PPE	Personal Protective Equipment
PRG	Preliminary Remediation Goal
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCSRs	Quality Control Summary Reports
QIPR	Quarterly In-Progress Review
RAC	Risk Assessment Code
RI/BRA	Remedial Investigation/Baseline Risk Assessment
RMSF	Rocky Mountain Spotted Fever
RRC	Regional Readiness Command
RTK	Real-Time Kinematic
SAIC	Science Applications International Corporation
SARA	Superfund Amendments and Reauthorization Act
SDSFIE	Spatial Data Standards for Facilities Infrastructure and Environment
SG	Site Geophysicist
SI	Site Inspection
SOW	Scope of Work
SSC	Site Safety Coordinator
SSHP	Site-Specific Safety and Health Plan
STL	Severn Trent Laboratories
SUXOS	Senior UXO Supervisor
SVOCs	Semi-Volatile Organic Compounds
TACO	Tiered Approach to Corrective Action Objectives
TAL	Target Analyte List

ACRONYMS

TDEM	Time Domain Electromagnetic Sensor
TPM	Technical Project Manager
TPgM	Technical Program Manager
TPP	Technical Project Planning
U.S.C.	United States Code
US	United States
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USAF	United States Air Force
USARC	United States Army Reserve Complex
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTL	Upper Tolerance Limit
UTM	Universal Transverse Mercator Coordinates
UXO	Unexploded Ordnance
UXOSO	UXO Site Safety Officer
VOCs	Volatile Organic Compounds
WP	Work Plan
WWI	World War I
WWII	World War II

GLOSSARY OF TERMS

Closed Range – A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component.

Defense Site – Locations that are or were owned by, leased to, or otherwise possessed or used by the Department of Defense. The term does not include any operational range, operating, storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions. (10 USC 2710(e)(1))

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 USC 2710(e)(2))

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration.

Explosives Safety – A condition where operational capability and readiness, personnel, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions.

Formerly Used Defense Site (FUDS) – A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A FUDS property is eligible for the Military Munitions Response Program (MMRP) if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.

Glossary of Terms (continued)

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.) have been completed. (10 USC 101(e)(4))

Munitions Constituents (MC) – Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 USC 2710(e)(4))

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: Unexploded Ordnance (UXO), as defined in 10 USC 2710(e)(9); Discarded military munitions (DMM), as defined in 10 USC 2710 (e)(2); or Munitions Constituents (MC) (e.g. TNT, RDX), as defined in 10 USC 2710 (e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Debris – Remnants of munitions (e.g. fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Glossary of Terms (continued)

Munitions Response (MR) – Response actions, including investigation, removal and remedial actions to address the explosives safety, human health, or environmental risks presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required.

Munitions Response Area (MRA) – Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.

Munitions Response Site (MRS) – A discrete location within a MRA that is known to require a munitions response.

Operational Range – A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities (10 USC 101 (e)(3)). Also includes "military range", "active range", and "inactive range" as those terms are defined in 40 Code of Federal Regulations (CFR) 266.201.

Range – The term 'range,' when used in a geographic sense, means a designated land or water area that is set aside, managed, and used for range activities of the Department of Defense. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration. (10 USC 101 (e)(1))

Transferred Range – A range that is no longer under military control and had been leased by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. Additionally, property that was previously used by the military as a range, but did not have a formal use agreement, also qualifies as a transferred range.

Glossary of Terms (continued)

Transferring Range – A range that is proposed to be leased, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An operational range will not be considered a transferring range until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been notified).

Unexploded Ordnance (UXO) – Military munitions that: have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded whether by malfunction, design, or any other cause. (10 USC 101 (e)(5))

1.0 INTRODUCTION

engineering-environmental Management, Inc. (e^2M) has prepared the following Work Plan (WP) for the Site Inspection (SI) of the other than operational ranges and other sites with known or suspected unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC) at Fort Sheridan, Illinois. These Munitions Response Sites (MRSs) are being addressed under the Military Munitions Response Program (MMRP) under Contract Number DACA-45-02-D0010, Task Order 003.

This WP has been developed to provide a description of the necessary tasks to complete this SI, and to ensure it will be performed in conformance with the United States Army Corps of Engineers (USACE), Omaha District project Scope of Work (SOW), dated 19 March 2004. This WP incorporates the findings of the Historical Records Review (HRR), Conceptual Site Model (CSM), and the resolutions and ideas generated during the Technical Project Planning (TPP) development process for the Munitions Response Areas (MRAs) and MRSs at Fort Sheridan. This WP consists of the following sections: **Section 2** outlines the project team and their roles and responsibilities; **Section 3** provides historical information and a physical description of the installation and the MRAs and MRSs; **Section 4** provides the findings of the records review process (i.e., Closed Transferring and Transferred (CTT) Range/Site Inventory, HRR, interviews, and site visits); **Section 5** presents a summary of the proposed field work activities; **Section 6** covers the proposed analytical program; **Section 7** provides a summary of the health and safety considerations and appropriate measures to be taken; and **Section 8** provides a summary of the data to be collected and reporting requirements.

More detailed site specific operating protocols and procedures are presented in the following appendices: Field Sampling Plan (FSP) (**Appendix A**); Quality Assurance Project Plan (QAPP) (**Appendix B**); and Site-specific Safety and Health Plan (SSHP) (**Appendix C**).

This WP will be used with the understanding that unanticipated conditions may dictate a change in the plan as written. Any necessary deviations from the plan will be brought to the attention of the USACE, Omaha District Project Manager (CENWO-PM) as soon as possible and a written request for variance will be submitted to document the decision made.

1.1 Executive Summary

A summary of the proposed MMRP SI field activities is provided below and discussed in greater detail in **Section 5.0** of this WP. The intent of the SI field work is to collect the data necessary to assist in determining what future actions, if any, are to be taken at the MRSs and MRAs. The regulatory framework, project objectives, and project schedule are included in the following subsections.

Table 1-1: Summary of Proposed MMRP SI Field Activities

MRS/MRA	Proposed SI Activity	Rationale
Trench Warfare Range MRS	Perform magnetometer-assisted visual survey to avoid any possible munitions and explosives of concern (MEC) and to bias surface soil sample locations toward areas most likely impacted by MC. Collect up to 5 biased surface soil samples. Samples will be analyzed for target analyte list (TAL) Metals (United States Environmental Protection Agency [USEPA] Methods 6010C/7470) and Explosives (USEPA Method 8330).	MEC is possible but not probable at the site due to extensive erosion in the area. Soil sampling will be conducted to assist with site prioritization and determination of further actions at the site.
Anti-Aircraft Artillery (AAA) Complex MRA	Perform magnetometer-assisted visual survey at the AAA Firing Point "A" MRS portion of the MRA only, to avoid any possible MEC and to bias surface soil sample locations toward areas most likely impacted by MC. Collect up to 5 biased surface soil samples. Samples will be analyzed for TAL Metals (USEPA Methods 6010C/7470) and Explosives (USEPA Method 8330).	MEC has not been confirmed at the site; however, its presence is possible. MC contamination is possible at the site. Soil sampling will be conducted to assist with site prioritization and determination of further actions at the site.
AAA Complex – Transferred (TD) MRS	No field work will be conducted under this SI effort.	This MRS has been recommended for No Further Action (NFA); therefore, no field work will be conducted under this SI effort.
Grenade Course MRS	No field work will be conducted under this SI effort.	Presence of MEC has been confirmed through historic records research. Metals have been detected exceeding background concentrations at the site during previous investigations and metallic debris of unknown origin was detected beneath the bluff.

Table 1-1: Summary of Proposed MMRP SI Field Activities, continued

MRS/MRA	Proposed SI Activity	Rationale
Small Arms Range Complex MRA	No field work will be conducted under this SI effort.	Based upon the findings of the HRR and discussions with the Fort Sheridan Army Reserve Complex (FSARC) stakeholders, MEC is not a concern at this MRA. Previous investigations at the site showed no lead levels in excess of background concentrations.

1.1 Regulatory Framework

The regulatory structure for managing MRAs and MRSs at Fort Sheridan is guided by a mixture of federal, state, and local laws, as well as Department of Defense (DoD) and United States (US) Army regulations and guidance. Key legislative and administrative precedents to date will undoubtedly influence the final regulatory framework for the MMRP. The key legislative and administrative precedents include the following:

- The Office of the Secretary of Defense (OSD) Defense Environmental Restoration Program (DERP) Guidance (September 2001) established an MMRP element for defense sites with known or potential UXO, DMM, or MC. The history of DERP dates back to the Superfund Amendments and Reauthorization Act (SARA) of 1986 and is defined in 10 United States Code (U.S.C.) §2701(b), which states the goals of the program shall include the following:
  - The identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants; and
  - Correction of other environmental damage (such as detection and disposal of UXO) which creates an imminent and substantial endangerment to the public health or welfare, or to the environment.
- Sections 311-312 of the National Defense Authorization Act (NDAA) of Fiscal Year (FY) 02 reinforced the OSD 2001 DERP Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain UXO, DMM, or MC.
  - Section 311 requires the DoD to develop a protocol for prioritizing defense sites for response activities in consultation with state regulators and Tribal members.
  - Section 312 requires the DoD to create a separate program element to ensure the DoD can identify and track MMRP funding.

The OSD 2001 DERP Guidance and the NDAA 2002, described above, established the MMRP. The DERP and the MMRP provide guidance and methods for conducting a baseline inventory of defense sites known or suspected to contain UXO, DMM, or MC.

1.2 Project Objectives

The primary objective of the MMRP SI is to collect the appropriate amount of information to support one of the following recommendations concerning the presence of munitions and explosives of concern (MEC) (which includes UXO, DMM, or MC) and/or MC:

- No Further Action (NFA);
- Immediate Response; or
- Further Characterization

The secondary objective of the SI is to apply the collected information to:

- Refine the MMRP Cost to Complete (CTC) estimates;
- Upload surface soil analytical data into the Environmental Restoration Information System (ERIS); and
- Populate portions of the Munitions Response Site Prioritization Protocol (MRS-PP) with background information and analytical data, as appropriate, for each MRA or MRS.

To accomplish these goals, a determination will be made whether or not MEC or MC are present at the two MRAs and three MRSs at Fort Sheridan. The MRAs include the Anti-Aircraft Artillery (AAA) Complex and the Small Arms Range Complex; and the MRSs include the Trench Warfare Range, the Grenade Course, and the AAA Complex – Transferred (TD). The presence of MEC has previously been confirmed at the Grenade Course.

1.3 Project Schedule

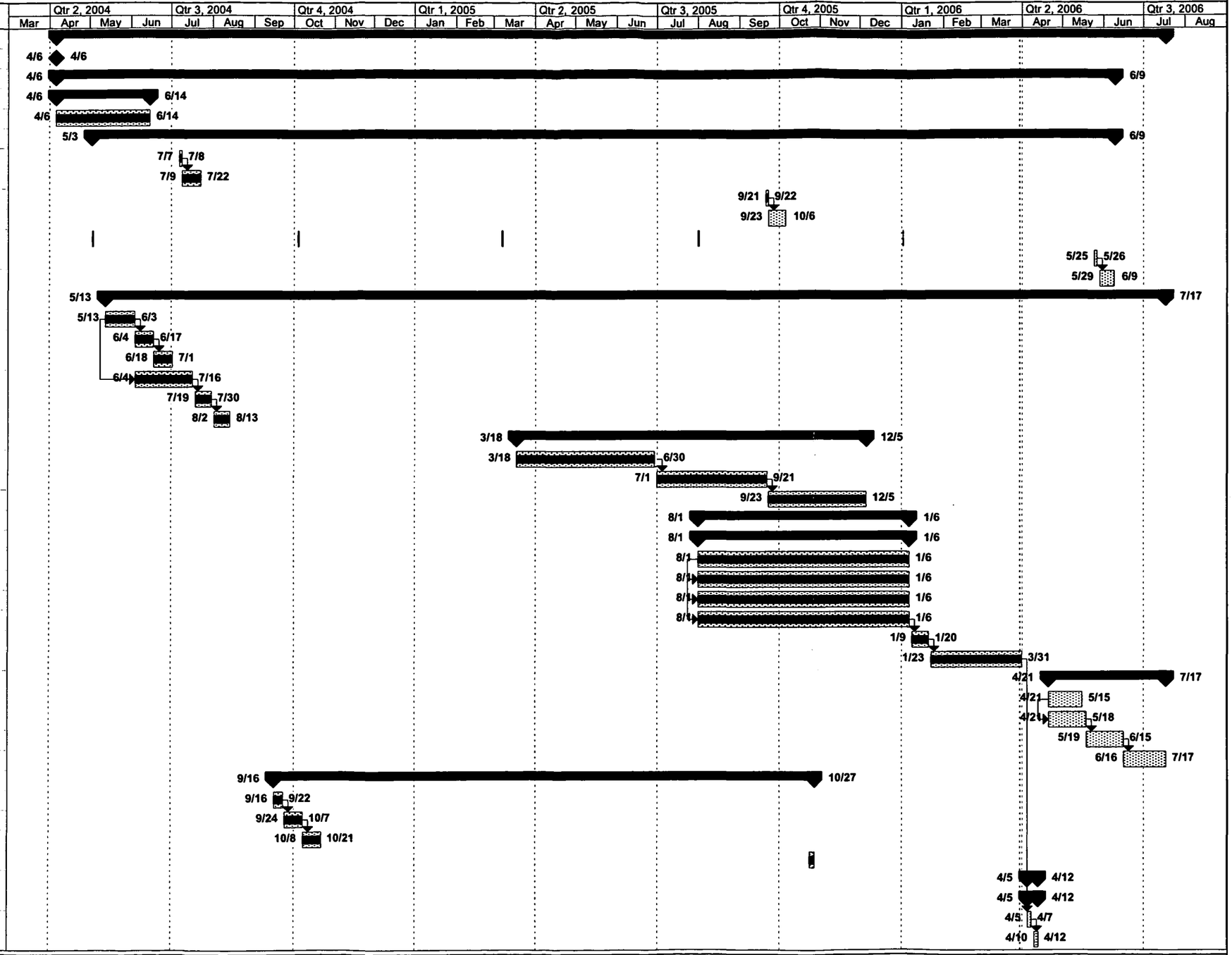
The project schedule is provided in **Figure 1-1**, and the major project milestones and target dates are provided below:

- ✓ Kick off meeting – 7 July 2004
- ✓ Records Review – 20–24 September 2004
- ✓ Records Search and Review – October 2004 and 18 April – 18 May 2005
- ✓ Draft Historical Records Review Report – 17 June 2005
- ✓ TPP 2 Meeting – 21 September 2005
- ✓ Final Historical Records Review Report – 21 December 2005
- ✓ Draft SI WP – 9 January 2006
- ✓ Final SI WP – 31 March 2006

- SI Field Work – 10 April 2006
- Draft SI Report – 15 May 2006
- TPP 3 Meeting – 25 May 2006
- Final SI Report – 17 July 2006

Figure 1-1: Project Schedule

ID		Task Name
0		**Fort Sheridan**
1		**Notice-to-Proceed Issued**
2		**Project Management**
3	✓	**Planning Phase**
4	✓	Develop Project Schedule
5		**Meetings**
6	✓	Kickoff Meeting at Installation (TPP 1)
7	✓	Meeting Notes (TPP1)
8	✓	Meeting at Conclusion of Records Review (TPP 2)
9		Records Review Meeting Notes
10		**Telephone Conference Calls**
16		Draft SI Report Meeting at the Installation (TPP 3)
17		Meeting Notes (TPP3)
18		**Plans and Reports**
19	✓	Develop and Submit Draft Project Management Plan
20	✓	USACE, Omaha Review
21	✓	Finalize and Submit Project Management Plan
22	✓	Develop and Submit Draft QAPP
23	✓	USACE, Omaha Review
24	✓	Finalize and Submit QAPP
25	✓	**Develop and Submit HRR**
26	✓	Develop and Submit Draft HRR
27	✓	Stakeholder Review
28	✓	Finalize and Submit HRR
29	✓	**Develop and Submit Site-Specific Work Plan**
30	✓	**Develop and Submit Draft Site-Specific Work Plan**
31	✓	Develop Site-Specific Work Plan
32	✓	Develop Site-Specific Field Sampling Plan
33	✓	Develop Site-Specific Safety and Health Plan
34	✓	Develop Site-Specific QAPP
35	✓	Stakeholder Review
36	✓	Finalize and Submit Site-Specific Work Plan
37		**Develop and Submit Site Inspection Report**
38		Develop and Submit Draft Site Inspection Report
39		Develop Quality Control Summary Report
40		Stakeholder Review
41		Finalize and Submit Site Inspection Report
42	✓	**Records Review e2M Team**
43	✓	Pre-Visit Coordination
44	✓	First Installation Visit
45	✓	Post-Visit & Supplemental Data Collection (phone, e-mail, etc.)
46	✓	TIC Visit
47		**Field Investigations**
48		**Geophysical Survey**
49		Pre-Mobilization Activities
50		Geophysical Survey and Sampling Field Activities



Project: Fort Sheridan
Figure 1-1: Project Schedule

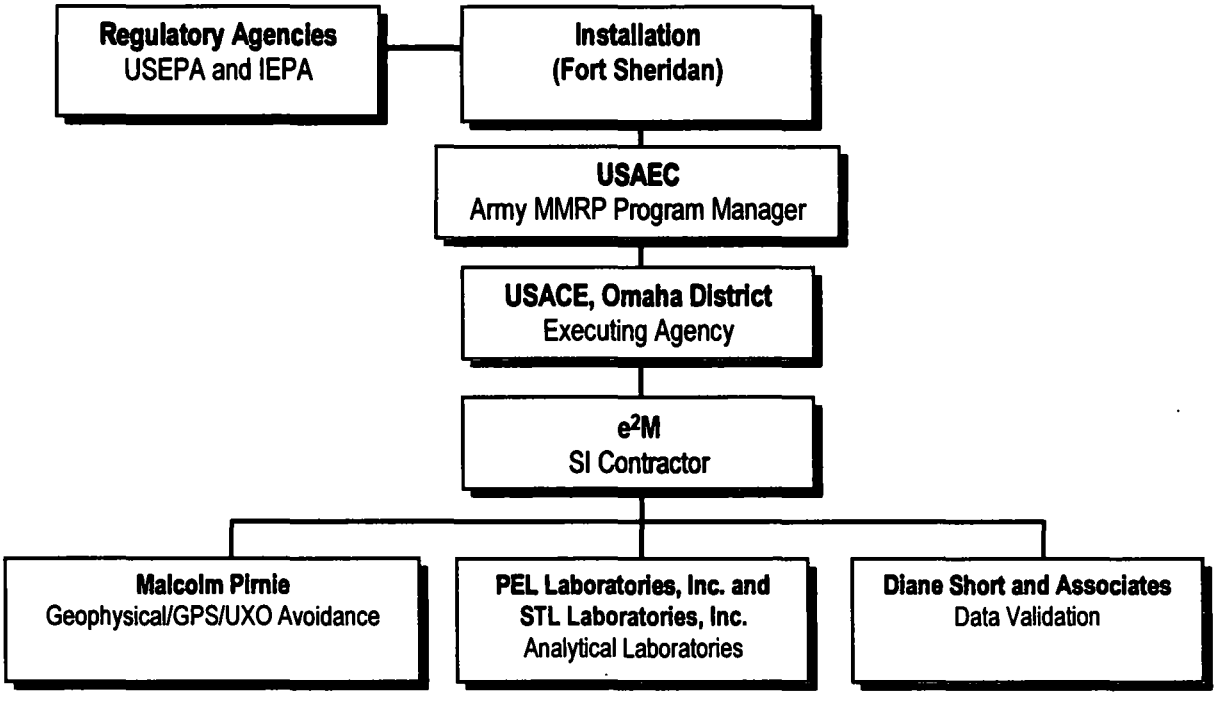
Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

2.0 PROJECT TEAM

2.1 Roles and Responsibilities

The multi-discipline Project Team is comprised of representatives from the Stakeholders; and e²M, the SI Contractor, with each having clearly defined roles and responsibilities that are integral to the successful execution of the SI. The United States Army Environmental Center (USAEC) is the overall program manager and is responsible for program management, project development, and providing guidance and oversight. The USACE, Omaha District is the executing agency for this SI and is responsible for contractor procurement and management, as well as providing technical oversight of the SI activities. Representatives from Fort Sheridan and USACE provide site-specific historical perspective relating to site use. The Illinois Environmental Protection Agency (IEPA) is the lead regulatory agency working with Fort Sheridan in the Installation Restoration Program (IRP), and provides regulatory oversight and approval of proposed actions to be taken at the installation. e²M is responsible for the development of the project work plans (e.g., FSP, SSHP, etc.), execution of the SI field activities, and reporting of results. e²M is also responsible for subcontractor procurement and oversight. The Project Team organization chart is provided in **Figure 2-1**.

Figure 2-1: Project Team Organization Chart



2.2 Stakeholders

The Fort Sheridan Stakeholders include representatives from the Fort Sheridan Army Reserve Complex (FSARC); the US Navy; the 88th Regional Readiness Command (RRC); USAEC; the IEPA; and the USACE, Omaha District. Contact information for representatives from each Stakeholder group is provided in **Table 2-1**.

Table 2-1: Stakeholder Representatives Contact Information

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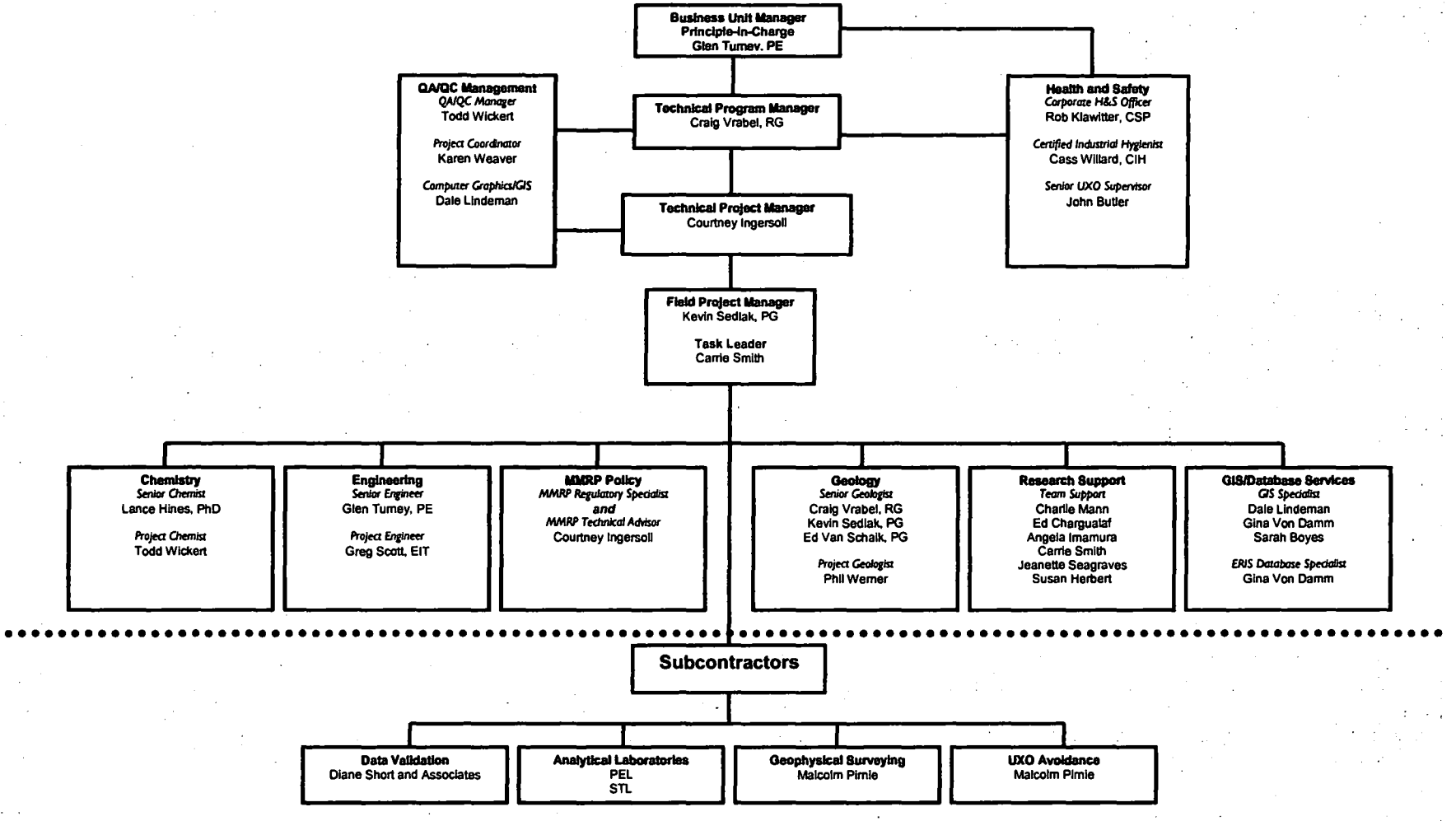
Dave Torgersen 88th RRC Environmental Office 506 Roeder circle, Fort Snelling, MN 55111 Telephone: 612-713-3820	Jerry Cencula, PE Navy Facilities Midwest Telephone: (847) 688-4766 x. 306 Jerry.Cencula@navy.mil

2.3 e²M Project Personnel

e²M is the MMRP SI Consultant and is under direct contract with the USACE, Omaha District to perform this SI for Fort Sheridan. e²M is responsible for completing this SI in accordance with USACE, Federal, State, and local regulations or guidance, as appropriate. Project-specific e²M personnel and their responsibilities are discussed below, and the e²M Project Organization Chart is shown in **Figure 2-2.**

Figure 2-2: e²M Project Organization Chart



Principal-in-Charge – Glen Turney, PE

Mr. Turney is the Vice President of Restoration at e²M and maintains the autonomy to direct or augment e²M corporate resources to accommodate project needs. The e²M Principal-in-Charge oversees the e²M Technical Program Manager (TPgM) and reports directly to the USACE-PM and the USACE, Omaha District Contract Officer (CENWO-CT). Any issues or problems the USACE-PM or CENWO-CT may experience may be addressed to the e²M Principal-in-Charge.

Corporate Health & Safety Director - Rob Klawitter, ASP

The e²M Corporate Health and Safety (H&S) Director maintains the organizational freedom and authority for ensuring full implementation of e²M's corporate H&S policies and the project SSHPs. Mr. Klawitter maintains a direct line of communication with the Principal-in-Charge and Technical Project Manager (TPM) of e²M and directs implementation of the SSHP. This includes the ability to delegate enforcement authority to other e²M personnel and ensuring SSHP compliance, including removal of individuals from the project for non-compliance.

Technical Program Manager (TPgM)/Project Geologist – Craig Vrabel, PG

The e²M TPgM has ultimate responsibility for all aspects of the project and reports directly to the e²M Principal-in-Charge, e²M Corporate H&S Director, and the USACE-PM. The e²M TPgM is also responsible for management and oversight of project subcontractors and the e²M TPM. As necessary, the TPgM will provide assistance to the TPM during project performance. Mr. Vrabel is a registered professional geologist and will perform as the Project Geologist, including signing and sealing of final SI Reports, as appropriate.

Technical Project Manager (TPM) – Courtney Ingersoll

The e²M TPM is responsible for execution, coordination, and completion of the project and reports directly to the e²M TPgM, e²M Corporate H&S Director, and the USACE-PM. The e²M TPM is also responsible for project personnel safety and health, including correction of all identified unsafe acts or conditions, and enforcement of procedures and regulations. The TPM is responsible for the implementation of the project plans, including project Quality Assurance/Quality Control (QA/QC) requirements.

Field Project Manager – Kevin Sedlak, PG

The e²M Field Project Manager (FPM) reports to the e²M TPM for all aspects of the field work and is responsible for enforcing safety and health rules, policies, and procedures on behalf of e²M. The e²M FPM will oversee all field activities and is the primary contact during their performance. The FPM is responsible for implementing the project WP requirements, including the FSP, SSHP, and QAPP.

Project Chemist - Lance Hines, PhD

The Project Chemist is responsible for the day to day management of the data at all stages to ensure that all project activities related to analytical data are performed to meet the project data quality objectives (DQOs). This includes implementing the QAPP and the individual site specific FSPs, reviewing additional project plans and procedures for quality issues, coordinating sample collection and analytical requirements with the contract laboratory(ies), and overseeing data review/validation and corrective actions processes.

Project Industrial Hygienist – Cass Willard, CIH

The e²M Project Industrial Hygienist is responsible for the development, oversight and implementation of the project SSHPs. The e²M Project Industrial Hygienist reports directly to the e²M Corporate H&S director and the TPM. In addition, the e²M Project Industrial Hygienist will oversee the development, characterization, and evaluation of significant contamination pathways to determine the level of UXO-DMM-MC related threats to human health and the environment associated with the MMRP ranges/sites.

Quality Assurance/Quality Control Manager – Todd Wickert

The QA/QC Manager reports to the TPM and oversees procedures development, training, control checks, and process correction/improvement actions including those addressed in the Project Management Plan (PMP) and the QAPP to ensure that range data are collected, processed, and prepared in the most accurate and timely method possible. Recognizing QA is inherently a government function and is being performed by USACE, Omaha District, the QA/QC Manager will perform an internal QA and overall qualification program. The QA/QC Manager will regularly coordinate with the TPM and FPM to ensure that the US Army and e²M QA/QC programs are aligned and that project deliverables are meeting technical performance and accuracy standards.

Geographic Information System/Database Specialist – Dale Lindeman

The e²M Geographic Information System (GIS)/Database Manager reports directly to the e²M TPM and is responsible for electronic project deliverables conforming to the requirements of the project SOW and the MMRP. Mr. Lindeman will provide guidance to the TPM on the requirements of GIS data to ensure conformance with National Mapping and National Spatial Data Infrastructure (NSDI) standards and Spatial Data Standards for Facilities Infrastructure and Environment (SDSFIE) where standards have been established. As directed by the TPM, the GIS/Database Specialist will oversee the development of electronic deliverable templates to be used for the SI project and provide QA/QC of files prior to submittal.

2.4 e²M Subcontractors

The following have been hired as sub-contractors to e²M to help complete this project for Fort Sheridan:

Malcolm Pirnie – will be responsible for performing magnetometer-assisted surveying for UXO avoidance. The Point of Contact (POC) is Al Larkins, Project Manager. Mr. Larkins can be contacted at:

300 East Lombard Street
Suite 610
Baltimore, MD 21202
(410) 230-9966
alarkins@pirnie.com

PEL Laboratories, Inc. (PEL) – will be responsible for analyzing samples using standard US Environmental Protection Agency (USEPA) Methods. PEL will be the primary analytical laboratory for this project and will provide all data packages, including ERIS deliverables. The POC is the laboratory project manager Darcy Weisman. Ms. Weisman can be contacted at:

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 x 237
dweisman@PELAB.com.

Severn Trent Laboratories, Inc. (STL) – This laboratory will analyze the sample splits for this project and will be responsible for analyzing samples using standard USEPA Methods. The POC is the laboratory project manager Cheryl Sklenar. Ms. Sklenar can be contacted at:

4955 Yarrow Street,
Arvada, Colorado 80002.
303-736-0100.

Diane Short and Associates, Inc. (DSA) – Ms. Diane Short of Diane Short and Associates, Inc. will be responsible for data validation of the analytical sample results and will be working independently of e²M. Ms. Short can be contacted at:

1978 South Garrison Street
Suite #9
Lakewood, CO 80227
303-271-9642.
dsa@easy.net

The subcontractors will be under the direct supervision of e²M's TPgM and during the conduct of the SI field activities, the FPM.

3.0 INSTALLATION BACKGROUND AND DESCRIPTION

Fort Sheridan (Federal Facility Identification number: IL2104IL131) is located along the southwestern shore of Lake Michigan in the State of Illinois and encompasses approximately 712 acres of land. An installation location map is provided in **Figure 3-1**. The parcel is roughly rectangular in shape and measures approximately 1.7 miles north to south and 0.7 miles east to west. To the north, the installation is bordered by the City of Lake Forest, to the west by Sheridan Road and the City of Highwood, to the east by Lake Michigan, and to the south by the City of Highland Park. Many buildings extend across the majority of the relatively flat, gently sloping terrain.

The surrounding area is generally suburban. Highwood, population 4,143, lies immediately adjacent to the southwest corner of Fort Sheridan. The urban center encompasses 0.6 square miles. Highland Park, population 31,365, covers 12.5 square miles and the City of Lake Forest, population 20,059, covers 17.1 square miles. These cities are relatively small and are comprised of mostly residential housing with some small shops and restaurants (www.census.gov; SAIC, 2002).

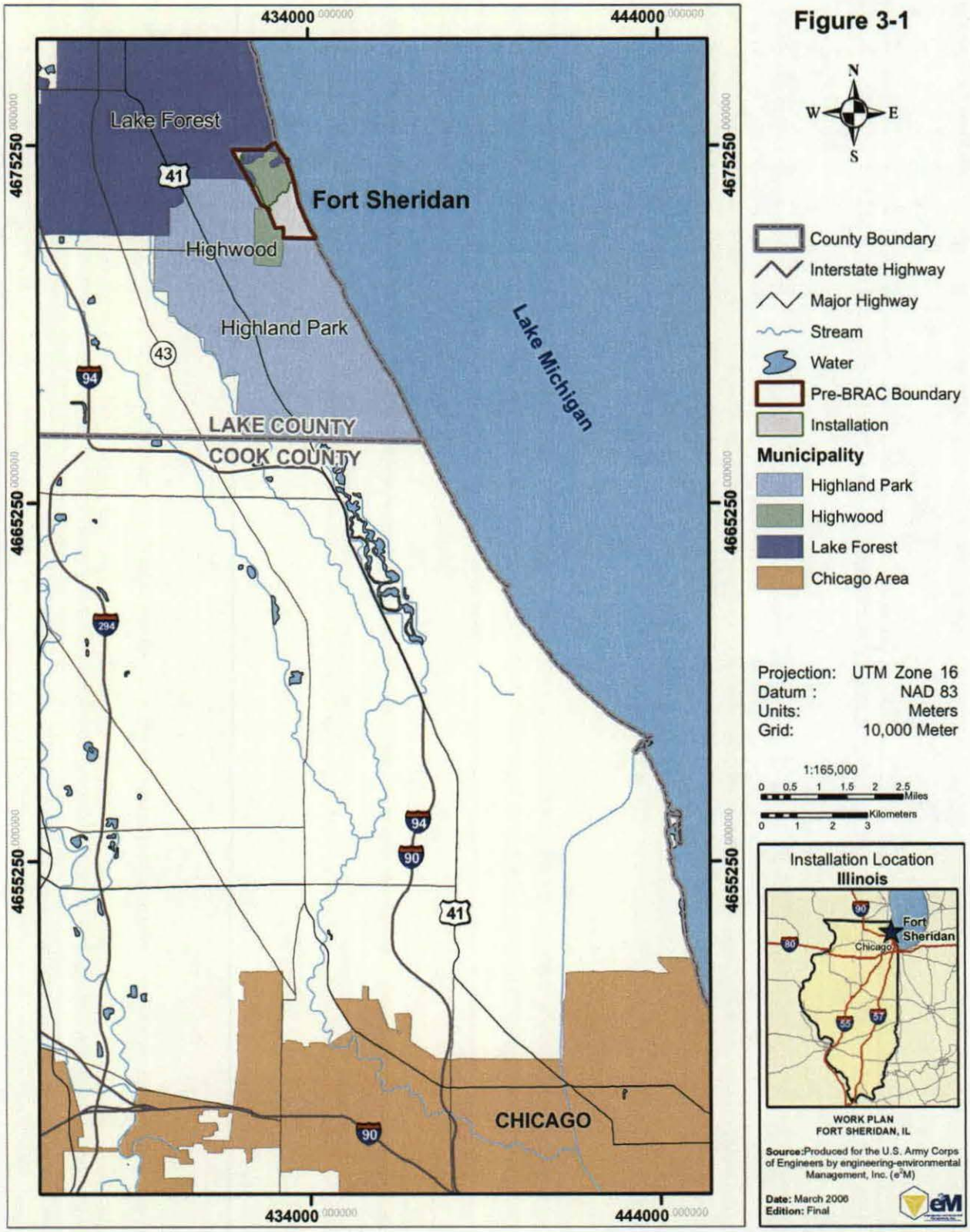
Fort Sheridan was established in 1887 to serve as an infantry post to help stabilize the City of Chicago following the Great Chicago Fire in 1871 and rioting by its citizens associated with labor problems (e^2M, 2002; USACE, 1996). Fort Sheridan was operational between 1887 and 1993 and "provided training facilities for US Army troops participating in the Spanish-American War (1898), the Mexican Intervention of 1913, World War I (1917), World War II (1940), and was established as a Nike missile launch site in the 1950s (SAIC, 1999)."

"Between 1967 and 1993, operations at Fort Sheridan were primarily administrative, with the Post serving alternately as headquarters for the Fifth Army, the US Army Recruiting Command, the Fourth Army, and also providing administrative and logistical support to 74 US Army Reserve centers located in Midwestern states from Minnesota to Michigan (SAIC, 1999)."

In 1988, Fort Sheridan was recommended for closure under Base Realignment and Closure (BRAC). The site officially closed in May 1993. "The southwest quadrant and the northwest corner (approximately 100 acres) of the Post were realigned to the US Army Reserve Command (USARC). In January 1994, the southeast quadrant and a small area on the central west side of Fort Sheridan (approximately 206 acres) were realigned to the US Navy for housing and administrative offices (SAIC, 1999)." The combined USARC and US Navy properties are also known as the DoD Operable

INSTALLATION LOCATION
Fort Sheridan, IL

Figure 3-1



R:\USACE Omaha\MMRP\MMRP SI 2 Installations\Fort Sheridan\WP Final\Fort Sheridan Work Plan 0303006.doc

Unit (OU) (approximately 306 acres). **Figure 3-2** provides the boundaries of the parcels of land as they were transferred under BRAC and shows the Lake County Forest Preserve. The remainder of the property at Fort Sheridan has been transferred out of DoD ownership under BRAC and is known as the Surplus OU. The majority of this property was transferred in March 1998 to the cities of Highland Park and Highwood and to the Lake County Forest Preserve District (Ceres, 2004).

The Trench Warfare Range MRS was identified during the 2002 Phase 3 US Army CTT Range/Site Inventory and further researched during the HRR. The additional MRSs (Grenade Course and AAA Complex –TD) and MRAs (AAA Complex and Small Arms Range Complex) were qualified under the MMRP due to historical site activities and the potential for MEC to be present. Site descriptions and operations conducted are provided below. **Figures 3-3 and 3-4** provide the locations of the MRSs and MRAs.

FORT SHERIDAN DoD PROPERTY BOUNDARY
Fort Sheridan, IL

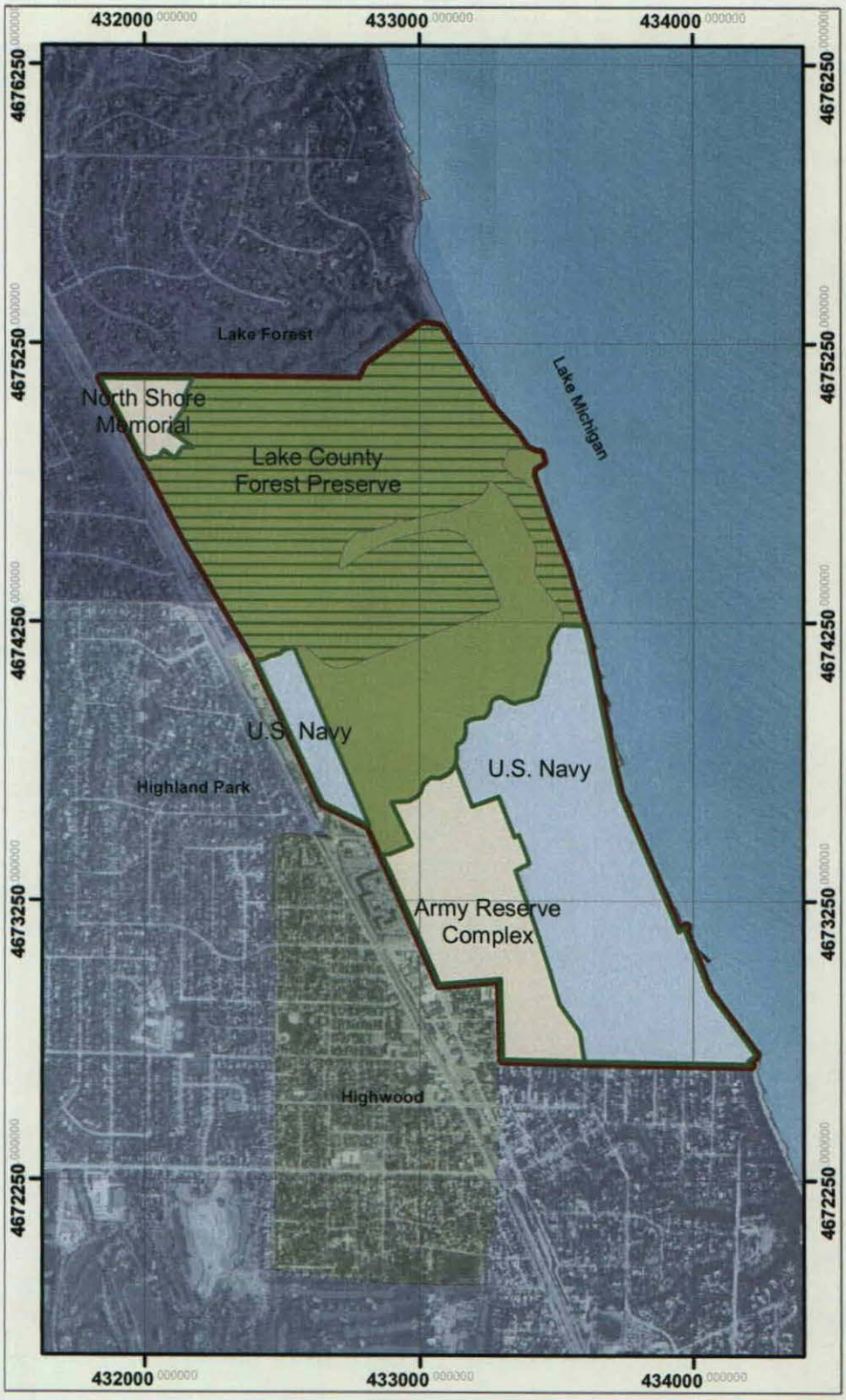


Figure 3-2

N
W E
S

Forest Preserve
Water
Pre-BRAC Boundary

Area Status
Surplus OU
U.S. Army Reserve
U.S. Navy

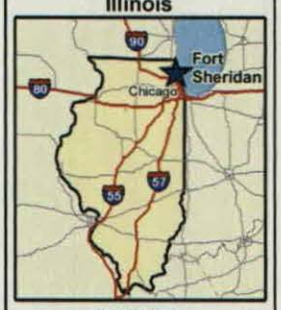
Municipality
Highland Park
Highwood
Lake Forest

Data Sources:
- CTT Range Inventory, Fort Sheridan Army Reserve Complex, IL. December 2002.
- Phase III RI/BRA 2000.

Projection: UTM Zone 16
Datum : NAD 83
Units: Meters
Grid: 1,000 Meter

1:24,000
0 2,000 Feet
0 100 200 300 400 500 600 Meters

Installation Location
Illinois



WORK PLAN
FORT SHERIDAN, IL

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^{2}M)

Date: March 2006
Edition: Final

MUNITIONS RESPONSE SITE (MRS) LOCATIONS
Fort Sheridan, IL

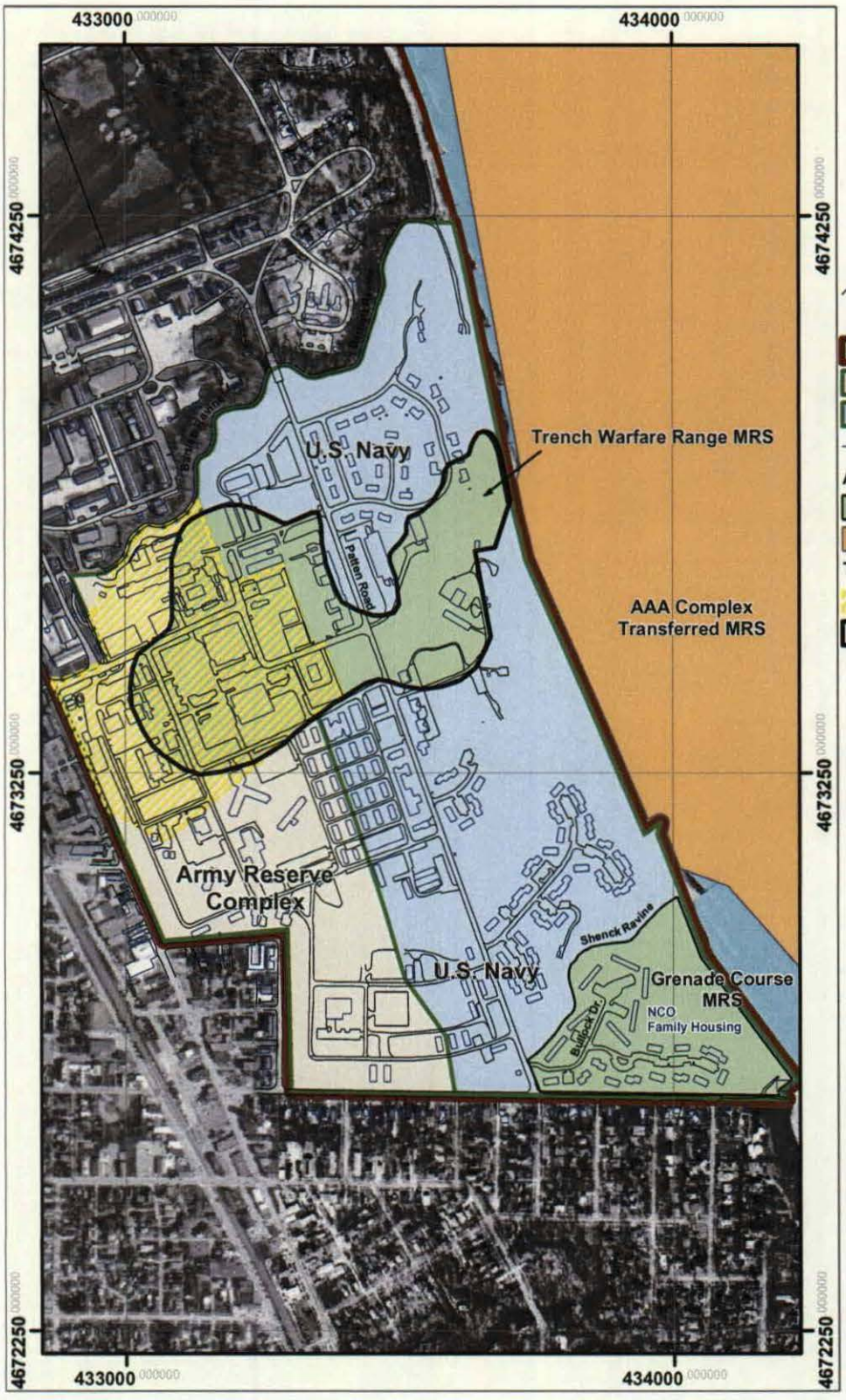


Figure 3-3

N
W E
S

Road
Water
Pre-BRAC Boundary
U.S. Army Reserve
U.S. Navy
Building Outline

Area Status
MRS
AAA Complex
Transferred MRS

Trench Warfare Range MRS
CTT Range Boundary
Current Boundary

Data Sources:
- CTT Range Inventory, Fort Sheridan Army Reserve Complex, IL, December 2002.
- Fort Sheridan Archive Search Report, Photo Maps 2 and 3, Map 3, Map 9, Site Visit Map, March 1996.
- War Department, United States Engineer Office, Post Map of Fort Sheridan, Illinois.

Projection: UTM Zone 16
Datum : NAD 83
Units: Meters
Grid: 1,000 Meter

1:12,000
0 1,000 Feet
0 320 Meters

Installation Location
Illinois

WORK PLAN
FORT SHERIDAN, IL

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: March 2006
Edition: Final

MUNITIONS RESPONSE AREA (MRA) LOCATIONS
Fort Sheridan, IL

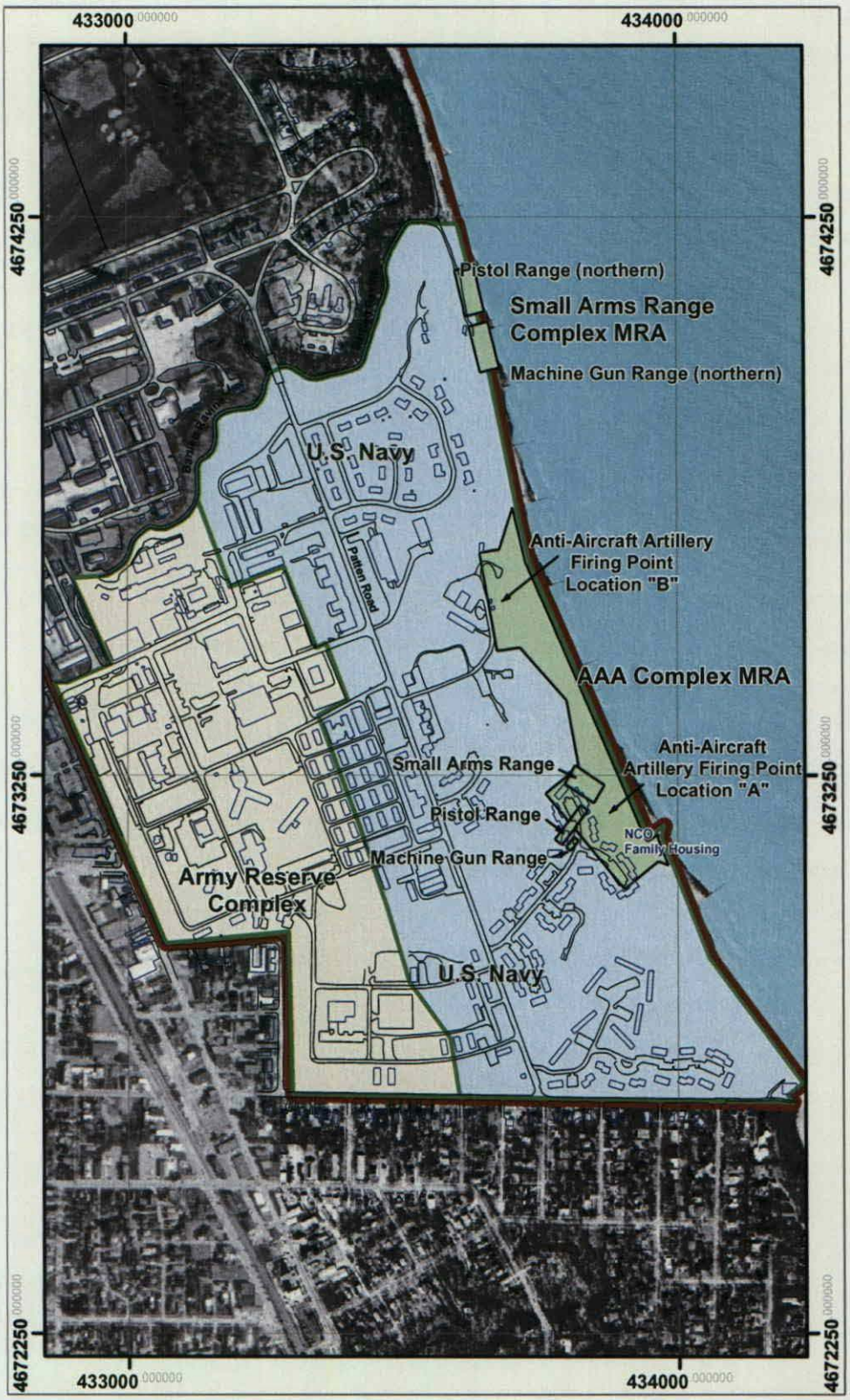


Figure 3-4

N
W E
S

Road
Water
Pre-BRAC Boundary
U.S. Army Reserve
U.S. Navy
Building Outline

Area Status
MRA

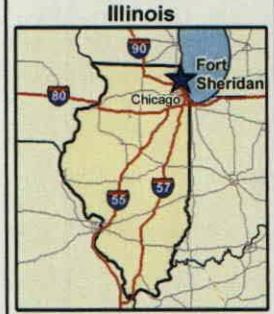
Data Sources:
- CTT Range Inventory, Fort Sheridan Army Reserve Complex, IL, December 2002.
- Fort Sheridan Archive Search Report, Photo Maps 2 and 3, Map 3, Map 9, Site Visit Map, March 1996.
- War Department, United States Engineer Office, Post Map of Fort Sheridan, Illinois.

Projection: UTM Zone 16
Datum : NAD 83
Units: Meters
Grid: 1,000 Meter

1:12,000

0 1,000 Feet
0 300 Meters

Installation Location
Illinois



WORK PLAN
FORT SHERIDAN, IL

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: March 2006
Edition: Final

3.1 Trench Warfare Range MRS (FTSH-001-R-01)

The Trench Warfare Range MRS (Army Environmental Database-Restoration [AEDB-R] Number FTSH-001-R-01) is located in the southern portion of Fort Sheridan south of Bartlett Ravine Road and around Van Horne Ravine. The 53.1 acre site was used between 1917 and 1919 to train military personnel for trench warfare during World War I (WWI). The trenches were dug in and around Van Horne Ravine. The trenches were filled in sometime after WWI, but the exact date is unknown (USACE, 1996). (See **Figure 3-3** for the location and **Figure 3-5** for the layout of the Trench Warfare Range MRS). The outline for the Trench Warfare Range used in the 2002 Phase 3 US Army CTT Range/Site Inventory Report has been updated to reflect the most accurate historical drawings of the trenches found in the 1996 Archive Search Report (ASR). Discussions with personnel from the USACE indicated that the updated outline for the Trench Warfare Range is more accurate. The acreage of the MRS was designated in the 2002 Phase 3 US Army CTT Range/Site Inventory Report as 42.5 acres; however, since the MRS was expanded to include the US Navy property, and the site boundary from the 2002 Phase 3 US Army CTT Range/Site Inventory was updated, the boundary of the MRS has changed and the MRS now comprises 53.1 acres.

According to the *Conclusions and Recommendations* section of the 1996 ASR, training munitions (including smoke grenades, flares, and blank ammunition) were used in the trenches. "At least one exercise involved the firing of three-inch mortars." The area suspected to contain MEC residue falls on the US Navy part of the MRS (to the east of Patten Road) (USACE, 1996). "The portion of the trench system located on either side of the Van Horne Ravine east of Patten Road appears to be the portion of the trench system most likely to have been used in training exercises involving opposing forces. It is assumed that the ravine itself would represent the "no man's land" between the two forces. This area, the ravine and trenches north and south of it, are the areas most likely to have ordnance and explosives (OE) residue (USACE, 1996)." The 1996 ASR recommends sampling a portion of Van Horne Ravine, specifically the portion to the east of Patten Road, now owned by the US Navy. The 1996 ASR does **not** recommend sampling on the Army property because "extensive construction over this area would have uncovered any OE near the surface (USACE, 1996)." The ASR recommends sampling of Van Horne Ravine for the following reasons: "(1) it is the portion of the trench system most likely to have OE remaining; (2) this area had little or no construction and erosion would tend to collect OE in the area....(USACE, 1996)."

TRENCH WARFARE RANGE MRS LAYOUT
Fort Sheridan, IL

Figure 3-5

N
W E
S

- Road
- U.S. Army Reserve
- U.S. Navy
- Building Outline
- Landfill

Area Status

- MRS
- AAA Complex Transferred MRS

Data Sources:
- Fort Sheridan Archive Search Report, Map 3, Site Visit Map, March 1996.
- Feasibility Study, May 2002.
- Sampling and Analysis Plan, Revision 5.0, March 2003.

Projection:	**UTM Zone 16**
Datum :	**NAD 83**
Units:	**Meters**
Grid:	**500 Meter**

1:5,000

0 100 200 300 400 500 Feet
0 50 100 150 Meters

Installation Location
Illinois

WORK PLAN
FORT SHERIDAN, IL

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: March 2006
Edition: Final

According to the ASR, the trenches were approximately six feet deep. After the trenches were filled in, they were built upon and the ground surface was raised leaving the bottom of the trenches more than six feet below ground surface (bgs). There are currently office buildings, parking lots, and maintenance facilities at the site. Some of the land is also used for recreational purposes.

Landfill 5 is located in the northwest part of the MRS and covers 1.4 acres of the site. It was used from approximately 1900 through the 1960s. "This former landfill is located in a light industrial area in Fort Sheridan and is surrounded by warehouse facilities (Kemron, 2003a)." The landfill contained "construction debris with large concrete blocks, rebar, metallic debris, slag, bricks, ash, glass, bottles, copper pipes and wires, automotive parts, asphalt, wood, wire, nails, and coal fragments (SAIC, 1999)." The landfill is currently used for vehicle and equipment storage and shop activities. Most of the site is fenced and overlain by concrete, asphalt, and grass (Kemron, 2003a).

Although metals contamination is present at the MRS, adequate analytical data is not available to determine if the source is MEC. Therefore, the existing data is not adequate to determine the presence or absence of MEC or MC. As such, soil samples will be collected and analyzed for target analyte list (TAL) metals and explosives to determine the presence of MC.

3.2 AAA Complex MRA (AEDB-R Number to be determined [TBD])

This MRA is composed of five separate MRSs: the AAA Firing Points "A" and "B", the Small Arms Range, the Pistol Range, and the Machine Gun Range. Note: these latter three ranges overlap with Firing Point "A" in the southern portion of the installation. The AAA Firing Points "A" and "B" comprise 13.7 acres. The Small Arms Range covers 0.6 acres, the Pistol Range covers 0.3 acres, and the Machine Gun Range covers 0.1 acres. The total MRA covers 14.7 acres. See **Figure 3-4** for the location and **Figure 3-6** for the layout of the MRA.

From 1930 to 1944, Fort Sheridan hosted several battalions for anti-aircraft activity. The 61st Coast Artillery, which had two gun battalions and an automatic weapons battalion, was transferred from Fort Monroe to Fort Sheridan in 1930. Personnel from the 61st Artillery also instructed reserve troops at Fort Sheridan. During World War II (WWII), 90millimeter (mm) and 40mm guns replaced 3-inch and 37mm guns. A US Army Air Defense Artillery school operated at Fort Sheridan between 1942 and 1944. This school had 8 automatic weapons battalions and 2 gun battalions in training in July of 1943. On 1 November 1944, Fort Sheridan was discontinued as a school (USACE, 1996).

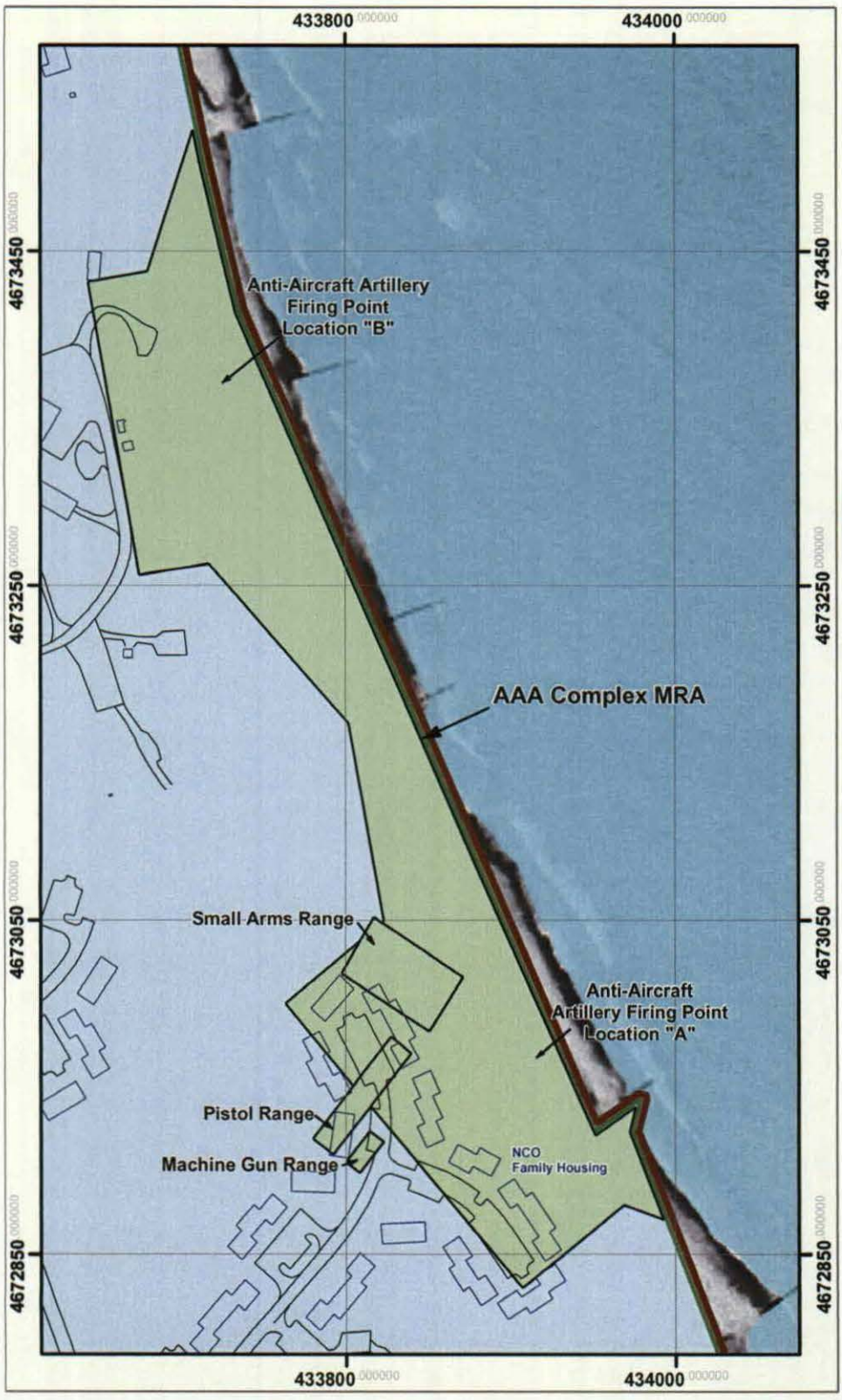
The MRA was used by the 61st Coast Artillery as a fly-over target range for projectiles including: 37mm, 40mm, 90mm, 120mm, and Rocket Launcher 2.36-inch Anti-Tank (AT). Targets were usually towed over Lake Michigan (USACE, 1996). Site reconnaissance conducted by Malcolm Pirnie in 2003 around both firing points did not reveal any visible evidence of UXO, DMM, or munitions related debris. The 1996 ASR indicates "OE has been found in the vicinity of the site", (Firing Point "B") including a 105mm cartridge case.

The northwestern corner of the former AAA Firing Point "A" overlaps with a small portion of Landfill 7. Landfill 7 was constructed within the former Wells Ravine and its tributaries and is one of the primary points of historical accumulation of municipal waste on the DoD OU. It is reported to have been used in the 1940s, 1960s, and 1970s, with all disposal operations ending in 1979 (SAIC, 1999). Landfill 7 was capped in 1980-1982 (Kemron, 2003b).

The AAA Area at Fort Sheridan had five firing points, labeled "A" through "E". Only firing points "A" and "B" were located on the current Navy property and qualified for the MMRP (See **Figures 3-4 and 3-6**). Firing Points "C", "D", and "E" were located outside of the footprint of interest for this SI and were located in the northeastern portion of Fort Sheridan close to the Lake Michigan shoreline on property transferred under BRAC to the Lake County Forest Preserve District. "Location A was the

AAA COMPLEX MRA LAYOUT
Fort Sheridan, IL

Figure 3-6



original firing point, but, because of complaints from local residents, location B became the primary firing location" (Harding ESE, 2001). A portion of Firing Point "B" overlaps with a portion of the Trench Warfare Range MRS, so the potential exits for munitions that were used in the trenches to be present at Firing Point "B".

Firing Points "A" and "B" make up approximately 13.7 acres and were located on the bluff and in the ridges of the southeastern portion of Fort Sheridan and were used from around 1930 to approximately 1950. Targets for this range were located both on the bluff and in Lake Michigan, therefore part of this range fan is a water range. The range fans that extend over Lake Michigan are discussed as a separate site (AAA Complex – TD MRS) in **Section 3.3**.

The Small Arms, Pistol, and Machine Gun Ranges are three separate ranges comprising approximately one acre. The ranges were used from approximately 1891 to 1950. Only small arms of 0.50 caliber or less were used at the ranges (Malcolm Pirnie, 2003). During site reconnaissance, no evidence of small arms ammunition was found at the sites (USACE, 1996 and Malcolm Pirnie, 2003).

Data gaps that exist and need to be addressed include adequate data to determine the presence or absence of MEC and the presence or absence of elevated levels of MC. Documents reviewed during the HRR indicated explosives have been detected during groundwater monitoring at Landfill 7; however, these results were inconsistent between sampling events and not confirmed in the analytical laboratory. Because this MRA will likely be recommended for further characterization, it was determined during the TPP 2 Meeting that obtaining a groundwater sample for explosives during the SI would not provide relevant data. Only a portion of the MRA and the MRA media has been evaluated, so the data is not representative of the entire MRA.

3.3 AAA Complex – TD MRS (AEDB-R Number TBD)

Targets for projectiles fired from the AAA Complex MRA were towed over Lake Michigan for training of the 61st Coast Artillery. There was the possibility of projectiles impacting up to 15 miles out onto Lake Michigan. This area is the AAA Complex – TD MRS (See **Figure 3-3**). See **Section 3.2** above for the history of the AAA Firing Points.

In the spring of 2000, Harding ESE contracted with UXB International to provide UXO diving support for investigative work they were performing in Lake Michigan. There was no evidence of UXO discovered during the investigation (Harding ESE, 2001). A Site Investigation Report performed by

Harding ESE in 2001 concluded no explosive constituents were present in the sediment samples collected in Lake Michigan. The report also concluded that chemical constituents in artillery fired at the AAA ranges have not impacted Lake Michigan. IEPA has reviewed these report findings and determined the risk at the site is acceptable.

3.4 Grenade Course MRS (AEDB-R Number TBD)

The Grenade Course MRS at Fort Sheridan is thought to have been located to the south of Shenck Ravine in the area currently occupied by non-commissioned officer (NCO) housing (See **Figure 3-3**). The Grenade Course is mentioned in the May-June 1943 issue of the Coast Artillery Journal. At that time, it was nearing completion. The site was closed in December 1948; therefore, use dates are assured to be from late 1943 to 1948. "This course was to be used for training with rifle and hand grenades against fixed and moving targets (USACE, 1996)." Site reconnaissance in the area did not reveal any visible evidence of UXO, DMM, or munitions related debris (Malcolm Pirnie, 2003).

Excavation Area #8, "the bluff area south of Shenck Ravine is thought to have been a potential fill area based on ground disturbances that were observed in historic aerial photographs (SAIC, 2001)." The exact boundaries of Excavation #8 are unknown at this time, but it is known the location is directly south of Shenck Ravine and directly west of the lakeshore. Field-portable electromagnetic (EM) devices (EM-31 and EM-61) were used to inspect for fill materials on the bluff during the Phase II Remedial Investigation/Baseline Risk Assessment (RI/BRA) done by Science Applications International Corporation (SAIC). "The mapped EM-61 instrument responses indicated the presence of metallic debris beneath the bluff....The nature of the metallic debris detected in the bluff is unknown. As-built information pertaining to the implemented bluff stabilization does not indicate the presence of engineered drainage structures on the terraced bluff. The EM-31 and EM-61 geophysical signatures confirmed the previous ground disturbance and possible fill emplacement on the bluff (SAIC, 2001)." Metallic debris of unknown origin or type was located during the Phase II geophysical survey, but it is unknown if it is MEC-related. No surface MEC was encountered during the geophysical survey.

However, MEC has been confirmed at the site. There were two Explosive Ordnance Disposal (EOD) response incidents in recent years regarding grenades in the suspected Grenade Course MRS area. The suspected area is now occupied by Navy family housing. According to the 1996 USACE ASR, an interview with Master Sergeant (MSG) George Foy who was stationed at Fort Sheridan from 1980-1981 and 1984-1989 with the 51st EOD, revealed that "One particular incident took place on Bullock Drive" (1st set of housing units on the right as you enter the housing area). He stated that "several live hand

grenade fuzes were dug up in the backyard." He also stated "two live WWII hand grenades were found in the wall of the old barracks on the south end of the post."

During the Phase III sampling during the RI/BRA done by SAIC in 2000 at Excavation Area #8, eight soil borings (SB-EA8-1 through SB-EA8-8) were collected and analyzed for metals and explosives. Aluminum, arsenic, chromium, iron, nickel, and vanadium were detected in excess of background concentrations. No explosives were detected at Excavation Area #8 during the Phase III sampling.

Further investigation for this site is recommended due to possible MC contamination, previous EOD responses at the site, and lack of a comprehensive UXO sweep of the MRS. However, due to the extent of previous field work, no additional field work will be necessary for the Grenade Course during this SI effort.

3.5 Small Arms Range Complex MRA (AEDB-R Number TBD)

The Northern Pistol and Machine Gun Ranges along the beach of Lake Michigan were two separate ranges comprising approximately 1.5 acres within Fort Sheridan (See **Figure 3-4**). The ranges are non-contiguous but were classified together by Malcolm Pirnie and the Navy during the Preliminary Assessment and the US Navy MMRP. For the purposes of the HRR, the ranges were complexed together into a MRA known as the Small Arms Range Complex. The ranges were used from approximately 1891 to 1950. Only small arms of 0.50 caliber or less were used at the ranges (Malcolm Pirnie, 2003). During site reconnaissance, no evidence of small arms ammunition was found at the sites (USACE, 1996 and Malcolm Pirnie, 2003).

Based upon the findings of the HRR and discussions with the FSARC stakeholders, MEC is not a concern at this MRA. During the RI/BRA sampling done by SAIC in 2000, four surface samples (SS-BPR-01 to SS-BPR-04) were collected from the beach sediment and two composite samples (SS-BPR-05 and SS-BPR-06) were collected from the bluff face at the Beach Pistol/Machine Gun Range (the Northern Pistol and Machine Gun Ranges in the Small Arms Range Complex MRA). Lead in the beach sediment did not exceed the background Upper Tolerance Limit (UTL) of 33.4 micrograms/gram (µg/g), and lead in the bluff face soil did not exceed the background soil UTL of 56.8 µg/g. In addition, during the SAIC sampling, no visual evidence was observed of a former firing range (for example, no berms, ammunition cartridges, or lead fragments were observed). Therefore, no additional field work will be necessary for the Small Arms Range Complex MRA during this SI effort.

4.0 RECORDS REVIEW

The primary sources of information which were researched as part of the data collection effort for this WP included:

- Fort Sheridan Administrative Record (AR);
- Existing Working Knowledge of the Fort Sheridan Installation (i.e., performance of an installation site visit and conducting interviews of installation personnel);
- Fort Sheridan Environmental Baseline Survey (EBS);
- National Archives Search;
- Information provided by Malcolm Pirnie;
- 2002 Phase 3 US Army CTT Range/Site Inventory Report for FSARC;
- ASR Findings and Conclusions and Recommendations for Fort Sheridan; and
- Fort Sheridan HRR.

4.1 Sources of Information

4.1.1 Fort Sheridan Administrative Record (AR)

The Fort Sheridan AR was reviewed to identify existing documents that contained information specific to the facility itself and potential types of MEC and MC that could reasonably be expected to be found at each site. The AR provided the following information:

- Site-specific information on the history of the installation.
- Site-specific information on the physical conditions (climate, geology/hydrogeology, topography, hydrology, soil, and vegetation) existing at the MRSs.
- Area-specific land use and human receptor information.
- Area-specific ecological setting and receptor information.
- Area-specific environmental contamination information.
- Area-specific ordnance and explosives removal and sampling actions.
- RI/BRA.
- Feasibility Study.

4.1.2 Installation Site Visits and Interviews with Installation Personnel

e^2M performed a records review site visit at Fort Sheridan on 20-24 September 2004. The intent of the visit was to gather any on-site records pertaining to the MRS (Trench Warfare Range) and determine if there was any evidence that the North Shore Memorial Area (former Nike Missile Area) may contain MEC or MC. Also, the goal was to interview on-site personnel from the BRAC office, 88th RRC and

on-site contractors. e²M reviewed environmental documents and performed interviews of site personnel to determine the environmental status and risk associated with specific portions of Fort Sheridan.

The interviews of site personnel are described in the following paragraphs:

Mr. Eric Johnson, State Environmental Manager, Northern Illinois 88th RRC, stated no MEC was discovered during the construction of a landfill cap for Landfill 5. He also indicated two new buildings were constructed in the area around Landfill 5 and their foundations were very deep; however, no MEC was discovered during construction. In addition, a road was built over a part of Landfill 5 and no MEC was discovered during the road construction either.

Mr. Bill Walters, Fort Sheridan Facilities Management Specialist, stated to the best of his knowledge (dating back to 1976), the only ordnance discovered at Fort Sheridan was a .45 caliber shell. Mr. Walters also indicated extensive construction of roads and buildings has occurred in the Trench Warfare Range area and there were no MEC reports during construction.

4.1.3 US Army CTT Range/Site Inventory Report

The focus of the 2002 Phase 3 US Army CTT Range/Site Inventory was on other than operational ranges and sites associated with the Fort Sheridan installation that may have been used in the past for ordnance-related testing and/or training. The objectives were to map all other than operational ranges and sites, collect and upload data into the Army Range Inventory Database (ARID), prepare an assessment of the explosives safety risk using the USACE Risk Assessment Code (RAC) worksheets, and determine which sites qualify for the MMRP. The data collection portion of the 2002 Phase 3 US Army CTT Range/Site Inventory consisted of a site visit, historical records review, and interviews with installation personnel.

The 2002 Phase 3 US Army CTT Range/Site Inventory, as previously stated, identified one closed range (the Trench Warfare Range) with an acreage of 42.5 acres.

4.1.4 Historical Records Review (HRR)

The intent of the HRR was to perform a records search to document historical and other known information for the MRSs and MRAs identified at Fort Sheridan, to supplement the 2002 Phase 3 US Army CTT Range/Site Inventory Report information, and to support the TPP process designed to

facilitate decisions on those areas where more information is needed to determine the next step(s) in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

The Trench Warfare Range MRS was identified during the 2002 Phase 3 US Army CTT Range/Site Inventory and further researched during the HRR. The additional MRSs (Grenade Course and AAA Complex –TD) and MRAs (AAA Complex and Small Arms Range Complex) were qualified under the MMRP due to historical site activities and the potential for MEC to be present. Based upon the data gaps that were identified in the HRR, it was recommended that further investigations be performed at the Trench Warfare Range MRS, Firing Point "A" of the AAA Complex MRA, and the Grenade Course MRS. However, further investigation at the Grenade Course will not be performed during this SI effort.

A CSM was prepared and submitted with the HRR report to help determine current or reasonably anticipated human and environmental exposures to MEC and MC by identifying potential human and ecological receptors. The CSM provided a conceptualization of the following on site conditions:

- physical and ecological profiles;
- actual or the reasonably anticipated presence of MEC and MC;
- anticipated points of exposure and exposure pathways; and
- actual or reasonably anticipated future human and ecological receptors.

The CSM is a flexible tool that can be used to assist and streamline the decision making process when developing an investigative approach used to characterize a site. In brief, the CSM allows for a focusing of the investigation tailored toward the current or reasonably anticipated exposure scenarios that are most critical to human health and the environment.

5.0 FIELD WORK

The intent of the field work is to collect the data necessary to assist in determining what actions, if any, are to be taken at the MRSs and MRAs. Therefore, a decision can be made from the data collected whether further characterization is required at the site(s), an immediate response is required, or the site(s) qualifies for a NFA. The information collected should also be sufficient to assist in refining the CTC estimates and site prioritization for the MMRP eligible sites. To obtain the information necessary to make these determinations, magnetometer-assisted visual surveys will be performed at both the Trench Warfare Range MRS, and the AAA Firing Point "A" MRS portion of the AAA Complex MRA to assist in the collection of surface soil samples from both sites. These activities will be conducted in accordance with the SOW prepared by USACE, Omaha District dated 19 March 2004, and more specifically, the following USACE Data Item Description (DID) documents:

- DID MR-005-01 Type II Work Plan;
- DID MR-005-02 Technical Management Plan;
- DID MR-005-03 Explosives Management Plan;
- DID MR-005-04 Explosives Siting Plan;
- DID MR-005-05 Geophysical Investigation Plan;
- DID MR-005-06 Accident Prevention Plan;
- DID MR-005-07 Geospatial Information and Electronic Deliverables;
- DID MR-005-08 Work, Data, and Cost Management Plan;
- DID MR-005-09 Property Management Plan;
- DID MR-005-10 Munitions Constituents Chemical Data Quality Deliverable;
- DID MR-005-11 Quality Control Plan;
- DID MR-005-12 Environmental Protection Plan;
- DID MR-005-13 Investigative Derived Waste Plan; and
- DID MR-005-14 Geographical Information Systems.

Table 5-1 lists the type of investigative activities proposed for each MRS and MRA, the rationale behind the proposed approach, and a description of the site conditions (e.g., terrain, canopy cover).

Table 5-1: SI Field Investigation Activities and Rationale

MRS/MRA	Proposed SI Activity	Physical Profile	Rationale
Trench Warfare Range MRS	Perform magnetometer-assisted visual survey to avoid any possible MEC and to bias surface soil sample locations toward areas most likely impacted by MC. Collect up to 5 biased surface soil samples. Samples will be analyzed for TAL Metals (USEPA Methods 6010C/7470) and Explosives (USEPA Method 8330).	The site (Army and Navy owned) is easily accessible, relatively flat, and much of it has been paved over with roads and buildings. The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	MEC is possible but not probable at the site due to extensive erosion in the area. Soil sampling will be conducted to assist with site prioritization and determination of further actions at the site.
AAA Complex MRA	Perform magnetometer-assisted visual survey at the AAA Firing Point "A" MRS portion of the MRA only, to avoid any possible MEC and to bias surface soil sample locations toward areas most likely impacted by MC. Collect up to 5 biased surface soil samples. Samples will be analyzed for TAL Metals (USEPA Methods 6010C/7470) and Explosives (USEPA Method 8330).	Firing Point "A" is now covered by Navy Family Housing (Navy owned property). Lake Michigan borders the site to the east. The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	MEC has not been confirmed at the site; however, its presence is possible. MC contamination is possible at the site. Soil sampling will be conducted to assist with site prioritization and determination of further actions at the site.
AAA Complex – TD MRS	No field work will be conducted under this SI effort.	The site's topography includes the shoreline (Navy owned property) of Lake Michigan and the Lake itself.	This MRS has been recommended for NFA; therefore, no field work will be conducted under this SI effort.

Table 5-1: SI Field Investigation Activities and Rationale, continued

MRS/MRA	Proposed SI Activity	Physical Profile	Rationale
Grenade Course MRS	No field work will be conducted under this SI effort.	The site is now covered by Navy Family Housing (Navy owned property). The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	Presence of MEC has been confirmed through historic records research. Metals have been detected exceeding background concentrations at the site during previous investigations and metallic debris of unknown origin was detected beneath the bluff.
Small Arms Range Complex MRA	No field work will be conducted under this SI effort.	The Small Arms Range Complex is flat and covers some area along the beach of Lake Michigan (Navy owned property). The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	Based upon the findings of the HRR and discussions with the FSARC stakeholders, MEC is not a concern at this MRA. Previous investigations at the site showed no lead levels in excess of background concentrations.

5.1 Munitions and Explosives of Concern (MEC)

The primary objective of this SI is to collect sufficient data to determine if MEC or MC are present within the MRSs and MRAs and to determine if an immediate response or further characterization is necessary or if a NFA determination can be made. In most cases, encountering just one MEC item will be sufficient to determine that additional work is necessary to characterize a particular MRS or MRA.

Trench Warfare Range MRS

The presence of MEC is possible but not probable at the Trench Warfare Range due to extensive erosion in the area, and further investigation has been recommended; therefore, a magnetometer-assisted visual survey will be conducted at this site during the field work portion of this SI to assist with the collection of surface soil samples. Because the survey will be conducted in and around Van Horne Ravine, a meandering path approach will be followed.

AAA Complex MRA

AAA Firing Point "A" MRS portion of the AAA Complex MRA

The presence of MEC is possible at the AAA Firing Point "A" MRS portion of the AAA Complex MRA and further investigation has been recommended; therefore, a magnetometer-assisted visual survey will be conducted at this site to assist in the collection of surface soil samples during the field work portion of this SI.

Small Arms, Pistol, and Machine Gun Range MRS portions of the AAA Complex MRA

At the Small Arms, Pistol, and Machine Gun Range MRSs within the AAA Complex MRA, MEC is only considered to be a concern within the areas that overlap the AAA Firing Point "A" MRS; therefore, no field work will be conducted on these MRSs during this SI.

AAA Complex – TD MRS

This MRS has been recommended for NFA; therefore, no field work will be conducted under this SI effort.

Grenade Course MRS

The presence of MEC has previously been confirmed at this MRS and further investigation has been recommended; however, due to the extent of previous field work, no additional field work will be necessary for the Grenade Course MRS during this SI effort.

Small Arms Range Complex MRA

Based upon the findings of the HRR and discussions with the FSARC stakeholders, MEC is not a concern at this MRA; therefore, no field work will be conducted on this MRA during this SI.

The magnetometer-assisted visual surveys will be performed by a UXO Technician II, who will be present for the duration of the field work. The UXO Technician II will support the implementation of UXO-oriented anomaly avoidance procedures while project team members are present on the site and will determine the identity and condition of MEC (if any) that is discovered on the surface. In addition, the UXO Technician II will provide the FPM with recognition and avoidance training of MEC. Additional details are provided in the SSHP provided in **Appendix C.**

No intrusive activities or excavations will be performed during the visual surveys. If any suspect MEC at the surface is discovered it will be evaluated by a qualified UXO Technician II to determine if it is MEC, munitions debris, or scrap material. This will be done to ensure the field teams safety during the visual survey work. Discovered MEC will be reported to the e²M TPM, CENWO-PM, and Dr. Kurt Thomsen (the Fort Sheridan BRAC Environmental Coordinator [BEC]). The City of Waukegan Fire Department will then be contacted at (847) 249-5410 (business hours) or (847) 599-2608 (after hours) by Dr. Thomsen if EOD support is needed.

Only visual inspections and limited identification of potentially hazardous MEC surface items are proposed for the magnetometer-assisted visual surveys under this SI. If MEC or suspect material are encountered, the team will stop, flag the location, record the position with a Global Positioning System (GPS), take field notes indicating the general location of the item or suspect area, its condition, and any other pertinent information, take a photograph of the item or suspect area, and notify the e²M TPM, the CENWO-PM, and Dr. Kurt Thomsen.

The magnetometer-assisted visual surveys are not intended to confirm all types of MEC present, determine the exact MEC density, or define the exact limits of MEC.

5.1.1 Magnetometer-Assisted Visual Survey

Handheld magnetic gradiometers (magnetometers) (e.g., Schonstedt or equivalent) will be used by the UXO Technician II to assist in locating ferrous metallic items on the ground surface at the Trench Warfare Range MRS and the AAA Firing Point "A" MRS portion of the AAA Complex MRA. The handheld magnetic gradiometer will be calibrated in accordance with the procedures outlined in the FSP (**Appendix A**). The UXO Technician II will visually sweep his search area to locate metallic objects that may be munitions debris, MEC, or miscellaneous metal debris. The UXO Technician II will record the identification and locations of all MEC or munitions debris items that are discovered. Munitions debris items will be counted and reported on a per area basis; the munitions debris items will not be removed. **Table 5-1** lists the type of investigative activities proposed for each MRS and MRA, the rationale behind the proposed approach, and a description of the site conditions (e.g., terrain, canopy cover).

5.1.2 Procedure – UXO Avoidance

UXO avoidance techniques will be used during the magnetometer-assisted visual surveys and when collecting soil samples. Hand held magnetic gradiometers (magnetometers) (Schonstedt or equivalent) will be used for safety purposes, in order to avoid potential MEC. The hand held detectors will be held in front of the person walking to alert the person of any metallic item that may be in their walking path, so it can be avoided and not stepped on. Even though the metallic item should be seen ahead of time with the naked eye, the metal detectors add a degree of safety since an item may be covered with leaves, tall grass, or debris making it difficult to see. The metal detectors will also alert the person to metallic items lying beneath the surface. Both surface and subsurface anomalies will be flagged in order to alert the soil sampling technician of areas to avoid when collecting surface soil samples.

A UXO Technician II will be responsible for identifying objects seen on the ground surface as potential MEC, munitions debris, or miscellaneous metal debris.

5.2 Munitions Constituents (MC)

A UXO Technician II will be present along with the FPM as part of the field team, and anomaly avoidance techniques will be used to identify an area or areas where a sample(s) can be collected safely. All soil samples will be collected at a depth of 0 – 6 inches bgs. Sample results will be compared to the IEPA Tiered Approach to Corrective Action Objectives (TACO) Tier I Soil Remediation Objectives for Residential Properties, or the USEPA Region 9 Preliminary Remediation Goals (PRGs), with the most stringent levels being used. If sample results for metals exceed the regulatory levels, installation specific background soils data from previous studies will be used for comparison. If this information is

unavailable, the comparison will be performed using regional United States Geological Survey (USGS) data.

Trench Warfare Range MRS

Up to 5 surface soil samples will be collected within the Van Horne Ravine (Navy owned) portion of the MRS at locations that will be field determined based upon the results of the magnetometer-assisted visual survey and field conditions. Samples will be biased toward any surface MEC or suspect areas that are found, if any.

AAA Firing Point "A" MRS portion of the AAA Complex MRA

Up to 5 surface soil samples will be collected from the AAA Firing Point "A" MRS portion of the AAA Complex MRA at locations that will be field determined based upon the results of the magnetometer-assisted visual survey and field conditions. Samples will be biased toward any surface MEC or suspect areas that are found, if any.

6.0 LABORATORY ANALYSIS

The process for selecting a suite of analytes is based, in part, on the munitions known or suspected to have been used or disposed of at a particular MRS. Furthermore, the analytical methods selected must meet the DQOs which have been generated based on the IEPA TACO Tier I Soil Remediation Objectives for Residential Properties, or the USEPA Region 9 PRGS, whichever are more stringent. Approximately 10 (not including QA/QC samples) surface soil samples will be collected from 0-6 inches bgs and will be analyzed for TAL Metals (USEPA Methods 6010C/7470) and Explosives (EPA Method 8330).

A more detailed discussion of the chemical analyses is provided in the QAPP, which can be found in **Appendix B**. The QAPP has been developed to support the sampling, analysis, and evaluation activities associated with this project. The QAPP consists of policies, procedures, specifications, standards, and documentation sufficient to produce data of quality adequate to meet the requirements of EPA and CERCLA, and to minimize loss of data due to out-of-control conditions or malfunctions.

7.0 HEALTH AND SAFETY

The SSHP provides the health and safety procedures to be followed by all on-site personnel during the conduct of the SI field activities. The SSHP will be implemented by the FPM/Site Safety Coordinator (SSC) during the SI field work. The Fort Sheridan SSHP has been prepared in conformance with: e²M's Health and Safety program, policies and procedures, as well as the guidelines established in the following documents: Data Item Description (DID) MR-005-06 Accident Prevention Plan; USACE Safety and Health Requirements Manual, EM 385-1-1; USACE Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW), ER 385-1-92; USACE OM 385-1-1; and applicable sections of 29 Code of Federal Regulations (CFR) 1910.120 and 29 CFR 1926.65.

The purpose of the SSHP is to ensure safe and healthy working conditions for all team members. The safety and health organization and procedures contained in the SSHP have been established based upon an analysis of the potential hazards. Personnel protection measures are based on these risks.

All e²M employees, subcontractors, and visitors who participate in activities at Fort Sheridan are required to comply with the SSHP. Refusal or failure to comply with the SSHP or violation of any safety procedures by field personnel, including subcontractors, may result in their immediate removal from the site following consultation with the e²M Corporate H&S Director.

The SSHP is included in **Appendix C**.

8.0 REPORTING OF SITE INSPECTION RESULTS

Field notes will be taken and Daily Quality Control Reports (DQCR) filled out for each SI field day by the FPM or his designee. The findings of the SI will be reported in a Draft and Final SI Report which will include the notes and DQCRs as appendices. The SI report will document findings of the inspection and provide a recommendation for immediate response, further characterization, or a NFA determination for each MRS or MRA.

The findings of the SI will also serve to improve the CTC estimate for any possible remediation of the MRSs or MRAs. The Draft SI Report will be reviewed by the CENWO-PM and other agencies/personnel as directed by the CENWO-PM. The Final SI Report will incorporate all review comments with responses by e^2M.

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FINAL
FIELD SAMPLING PLAN
MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
MUNITIONS RESPONSE SITES

FORT SHERIDAN, ILLINOIS

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MARCH 2006

SIGNATURE PAGE

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FINAL
FIELD SAMPLING PLAN
MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
MUNITIONS RESPONSE SITES

FORT SHERIDAN, ILLINOIS

MARCH 2006

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Attachment A Sample Daily Quality Control Report (DQCR) Form

1.0 INTRODUCTION

engineering-environmental Management, Inc. (e^2M) has prepared the following Field Sampling Plan (FSP) for the Site Inspection (SI) of the other than operational ranges and sites with known or suspected unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC) at Fort Sheridan, Illinois. These Munitions Response Sites (MRSs) are being addressed under the United States (US) Military Munitions Response Program (MMRP) under Contract Number DACA-45-02-D0010, Task Order 0003. This FSP is presented as an appendix to and is considered part of the Work Plan (WP) for Fort Sheridan.

e^2M has prepared this FSP to provide procedures that will be employed by e^2M personnel during performance of the field activities for this SI. This FSP will be used with the understanding that field conditions may dictate a change in the plan as written, and any changes will be approved by the United States Army Corps of Engineers (USACE), Omaha District, Project Manager (CENWO-PM). Field conditions that change this plan will be noted by the Field Project Manager (FPM) and addendum pages will be provided as appropriate.

2.0 PROJECT SCOPE AND OBJECTIVES

The objective of this SI is to determine the presence or absence of munitions and explosives of concern (MEC) and munitions constituents (MC) at the MRSs and Munitions Response Areas (MRAs) identified during the US Army Closed, Transferring, and Transferred (CTT) Range/Site Inventory at Fort Sheridan, located in Lake County, Illinois (**See Figures 3-1 and 3-2 of the WP**). MEC and MC that may be present from activities conducted by the Department of Defense (DoD) during operation of these sites may pose a threat to human health and/or the environment; therefore, an evaluation of these MRSs and MRAs is required.

The MRSs and MRAs that are the focus of the SI include the Trench Warfare Range MRS, the Anti-Aircraft Artillery (AAA) Complex MRA, the AAA Complex – Transferred (TD) MRS, the Grenade Course MRS, and the Small Arms Range Complex MRA (**See Figures 3-3 and 3-4 of the WP**). However, field work will only take place during this SI at the Trench Warfare Range MRS, and the AAA Firing Point "A" MRS portion of the AAA Complex MRA.

A UXO Technician II will be present during performance of the SI field work and will determine in consultation with the CENWO-PM, if MEC or evidence of MEC has been found on the MRSs or MRAs. The resulting SI report will document findings of the field work and provide one of the following recommendations for each MRS or MRA: No Further Action (NFA), immediate response, or further characterization.

The SI will also serve to refine the MMRP Cost to Complete (CTC) estimates, provide surface soil analytical data for upload into the Environmental Restoration Information System (ERIS), and provide data to populate portions of the Munitions Response Site Prioritization Protocol (MRS-PP) for each MRA or MRS.

Field activities will be performed in accordance with the USACE, Omaha District project Scope of Work (SOW) dated 19 March 2004, the WP, and this FSP. The field work will take place during April 2006 and is expected to last approximately one day.

2.1 Trench Warfare Range (FTSH-001-R-01)

The Trench Warfare Range MRS (Army Environmental Database-Restoration [AEDB-R] Number FTSH-001-R-01) is located in the southern portion of Fort Sheridan south of Bartlett Ravine Road and around

Van Horne Ravine. The 53.1 acre site was used between 1917 and 1919 to train military personnel for trench warfare during World War I (WWI). The trenches were dug in and around Van Horne Ravine. The trenches were filled in sometime after WWI, but the exact date is unknown. **(See Figures 3-3 and 3-5 of the WP** for the layout of the Trench Warfare Range MRS).

The site is now covered by buildings, roads, and parking areas. The Trench Warfare Range is currently used by employees of the United States Army Reserve Complex (USARC) and US Navy sites, maintenance workers, trespassers, and recreational users. The future usage of the site is unknown. The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.

The presence of MEC is possible but not probable at the Trench Warfare Range due to extensive erosion in the area, and further investigation has been recommended; therefore, a magnetometer-assisted visual survey will be conducted at this site during the field work portion of this SI to assist with the collection of surface soil samples. Because the survey will be conducted in and around Van Horne Ravine, a meandering path approach will be followed.

Surface soil samples will be collected and analyzed for primary MC (explosives, metals). Sample results will be compared to the Illinois Environmental Protection Agency (IEPA) Tiered Approach to Corrective Action Objectives (TACO) Tier I Soil Remediation Objectives for Residential Properties, or the US Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goals (PRGs), with the most stringent levels being used. If sample results for metals exceed the regulatory levels, installation specific background soils data from previous studies will be used for comparison. If this information is unavailable, the comparison will be performed using regional United States Geological Survey (USGS) data. Results will then be uploaded into the ERIS and will be used to populate a section of the MRS-PP to help prioritize the site for possible future investigation.

Refer to Section 3.1 of the WP for a detailed site description and more information regarding this site.

2.2 AAA Complex MRA (AEDB-R Number to be determined [TBD])

This MRA is composed of five separate MRSs: the AAA Firing Points "A" and "B", the Small Arms Range, the Pistol Range, and the Machine Gun Range. Note: these latter three ranges overlap with Firing Point "A" in the southern portion of the installation. The AAA Firing Points "A" and "B"

comprise 13.7 acres. The Small Arms Range covers 0.6 acres, the Pistol Range covers 0.3 acres, and the Machine Gun Range covers 0.1 acres. The total MRA covers 14.7 acres. **See Figures 3-4 and 3-6 of the WP** for the layout of the MRA.

The site is now covered by buildings, roads, and parking areas; and a Navy family housing area was built over Firing Point "A". The AAA Complex MRA is currently used by employees, residents, maintenance workers, trespassers, and recreational users. The future usage of the site is unknown. The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.

Possible source areas for MEC and MC are expected to be surface and subsurface soils primarily in the vicinity of Firing Point "A".

AAA Firing Point "A" MRS portion of the AAA Complex MRA

The presence of MEC is possible at the AAA Firing Point "A" MRS portion of the AAA Complex MRA, and further investigation has been recommended; therefore, a magnetometer-assisted visual survey will be conducted at this site during the field work portion of this SI to assist with the collection of surface soil samples.

Surface soil samples will be collected from the AAA Firing Point "A" MRS portion of the AAA Complex MRA and analyzed for primary MC (explosives, metals). Sample results will be compared to the IEPA TACO Tier I Soil Remediation Objectives for Residential Properties, or the USEPA Region 9 PRGs, with the most stringent levels being used. If sample results for metals exceed the regulatory levels, installation specific background soils data from previous studies will be used for comparison. If this information is unavailable, the comparison will be performed using regional USGS data. Results will then be uploaded into ERIS and will be used to populate a section of the MRS-PP to help prioritize the site for possible future investigation.

Small Arms, Pistol, and Machine Gun Range MRS portions of the AAA Complex MRA

Based upon the findings of the HRR and discussions with the Fort Sheridan Army Reserve Complex (FSARC) stakeholders, MEC and MC are not likely at the Small Arms, Pistol, and Machine Gun Range MRSs within the AAA Complex MRA; therefore, no field work will be conducted on these MRSs during this SI.

Refer to Section 3.2 of the WP for a detailed site description and more information regarding the site.

2.3 Remaining MRSs and MRAs

No field work will take place under this SI for the remaining MRSs and MRAs. **Refer to Section 3.2 of the WP** for detailed site descriptions and more information regarding these sites.

3.0 FIELD PERSONNEL AND PROJECT CONTACTS

The Project Team, Stakeholders, Subcontractors, and e²M's Project Personnel and Project Organization Chart are depicted in the WP.

The Field Project Personnel and Project Contacts are listed in **Table 1** below, along with their contact information. The e²M FPM (Kevin Sedlak), and a UXO Technician II are the only project personnel anticipated to be present on the MRSs and MRAs during the performance of the field effort for this SI. If any MEC is found on the MRSs or MRAs, the personnel listed under "Project Contacts" will be immediately notified.

Table 1: Field Personnel and Project Contacts

Name and Title	Contact Information
FIELD PERSONNEL	
Kevin Sedlak, e²M FPM	Cell: (210) 639-9719 Office: (210) 348-6000
UXO Technician II (Steve Burhans, Malcolm Pirnie)	Cell: (443) 804-7448 Office: (410) 230-0680
PROJECT CONTACTS	
Robert Zaruba, USACE CENWO-PM	Office: (402) 221-7659
Courtney Ingersoll, e²M Technical Project Manager (TPM)	Cell: (757) 999-3506 Office: (757) 643-7886
Dr. Kurt Thomsen, Fort Sheridan Base Realignment and Closure (BRAC) Environmental Coordinator (BEC)	Cell: (262) 880-5272 Office: (847) 266-6323

4.0 FIELD ACTIVITIES

Table 2 summarizes the investigative activities proposed for each MRS or MRA, the physical profile, and the rationale behind the investigative activities.

Table 2: Proposed Investigative Activities

MRS/MRA	Proposed SI Activity	Physical Profile	Rationale
Trench Warfare Range MRS	Perform magnetometer-assisted visual survey to avoid any possible MEC and to bias surface soil sample locations toward areas most likely impacted by MC. Collect up to 5 biased surface soil samples. Samples will be analyzed for target analyte list (TAL) Metals (EPA Methods 6010C/7470) and Explosives (EPA Method 8330).	The site (Army and Navy owned) is easily accessible, relatively flat, and much of it has been paved over with roads and buildings. The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	MEC is possible but not probable at the site due to extensive erosion in the area. Soil sampling will be conducted to assist with site prioritization and determination of further actions at the site.
AAA Complex MRA	Perform magnetometer-assisted visual survey at the AAA Firing Point "A" MRS portion of the MRA only, to avoid any possible MEC and to bias surface soil sample locations toward areas most likely impacted by MC. Collect up to 5 biased surface soil samples. Samples will be analyzed for TAL Metals (EPA Methods 6010C/7470) and Explosives (EPA Method 8330).	Firing Point "A" is now covered by Navy Family Housing (Navy owned property). Lake Michigan borders the site to the east. The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	MEC has not been confirmed at the site; however, its presence is possible. MC contamination is possible at the site. Soil sampling will be conducted to assist with site prioritization and determination of further actions at the site.

Table 2: Proposed Investigative Activities, continued

MRS/MRA	Proposed SI Activity	Physical Profile	Rationale
AAA Complex – TD MRS	No field work will be conducted under this SI effort.	The site's topography includes the shoreline (Navy owned property) of Lake Michigan and the Lake itself.	This MRS has been recommended for NFA; therefore, no field work will be conducted under this SI effort.
Grenade Course MRS	No field work will be conducted under this SI effort.	The site is now covered by Navy Family Housing (Navy owned property). The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	Presence of MEC has been confirmed through historic records research. Metals have been detected exceeding background concentrations at the site during previous investigations and metallic debris of unknown origin was detected beneath the bluff.
Small Arms Range Complex MRA	No field work will be conducted under this SI effort.	The Small Arms Range Complex is flat and covers some area along the beach of Lake Michigan (Navy owned property). The soil in the area is comprised of fine textured clay matrix with lenses of sorted and stratified sand, gravel, or silt within the clay matrix.	Based upon the findings of the HRR and discussions with the FSARC stakeholders, MEC is not a concern at this MRA. Previous investigations at the site showed no lead levels in excess of background concentrations.

4.1 Munitions and Explosives of Concern (MEC)

4.1.1 Schonstedt Procedure

The Schonstedt GA-52CX Magnetic Locator (handheld magnetic gradiometer [magnetometer]) or equivalent will be used to alert the field team to any potential surface and near surface MEC during the visual site survey and sample collection activities.

This device detects the magnetic field of any ferrous object even when covered by leaves, grass, soil, snow, etc. The instrument consists of two proton resonance magnetic field sensors approximately 0.5 meters (m) apart which balance out the effect of the earth's ambient magnetic field. As long as this balance exists, the frequency of the audio output signal remains at 40 Hertz. However, when the magnetic field becomes stronger at the lower sensor than it is at the upper sensor, the output signal frequency is increased. When the tip of the locator is positioned directly over the target (if the target magnetic dipole is oriented perpendicular to surface) the audio signal increases to its highest frequency where the magnetic field gradient is greatest.

During daily calibration, the Schonstedt GA-52CX will be swept across a known item (inert ordnance or surrogate item expected to be encountered on the range) within a known area free of subsurface anomalies to demonstrate consistent effectiveness. The inert ordnance or surrogate item will be buried at the appropriate detection depths below ground surface (bgs), which will be predetermined as a function of the mass shape and orientation of the selected target item, and any documented expected depth for a specific UXO item that will be encountered on site.

The Schonstedt GA-52CX will be tested with sufficient frequency and in such a manner as to ensure that accuracy and reproducibility of results are consistent with the manufacture's specifications. A Schonstedt GA-52CX failing to meet the standard will be repaired, recalibrated or replaced. The replacement Schonstedt GA-52CX must meet the same specifications for accuracy and precision as the one removed from service. This calibration also minimizes the influence of ambient background noise levels. To obtain maximum sweep area coverage (about 2.3m wide), the locator is swept from side to side with the sensor close to the ground.

4.1.2 Triggers for Immediate Response

It is not anticipated that removals will be required during this SI. However, the field team may encounter MEC and munitions debris during the visual site survey. A UXO Technician II will be part of the field team and will provide UXO safety services. Any MEC, munitions debris, or miscellaneous scrap

material that is encountered will be identified (when possible) from visual observation. Under no circumstances will MEC be handled, moved, or disturbed.

If an explosives safety hazard is present, there are five basic courses of action that can be undertaken – an emergency response, a time-critical removal action, a non-time-critical removal action, a remedial action, or no further action. The remedial action and no further action alternatives are typical after finishing the SI under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. An emergency response action for MEC is typically conducted by active-duty EOD personnel. A removal or response action can range from physical extraction (e.g., removal or Blow in Place [BIP] procedures) of the hazard to implementing institutional controls. Removal actions can be time critical in nature which requires that planning be completed in six months or less, or non-time critical. DoD has not issued any policy or guidance regarding the selection process for a response action at a MEC and/or MC site. Draft Directives and policy indicate that decisions should follow the CERCLA process. The decision is based on the overall threat to human health and the environment. The level of threat is based on an overall understanding of the situation and its risk based on site-specific data and the factors discussed in **Table 3**, below.

Table 3: MEC Factors for Immediate Response Actions

MEC Factors	Status Questions
Accessibility of the MEC	Is it in an area that is restricted to the public with engineering controls that preclude entry, such as fences, security guards, and posted hazards signs? Is the MEC in an area that is accessible to the public and does this create an imminent hazard to people or the environment?
Type of MEC	What are the condition, fuzing type, net explosive weight and specific hazards of the item? Does the MEC pose an immediate threat?
Site Assessment	Do the MEC and/or MC site conditions require using protective measures such as tamping, shielding, or focusing of the heat, blast, and shockwave to mitigate the explosive effects? What is the maximum fragmentation range and over-pressure distance of the MEC?
Other considerations	Can the hazard be moved? Can the area within the fragmentation and blast distance withstand a detonation and are there critical habitats or facilities located nearby?

The SI field work is not intended to include removal or disposal actions; however, if identified, the presence of MEC must be reported to the CENWO-PM; Dr. Kurt Thomsen, Fort Sheridan BRAC BEC; and the e²M TPM for determination of the appropriate action to be taken.

4.2 Munitions Constituents (MC)

A total of approximately 10 surface soil (0 - 6 inches bgs) samples will be collected and analyzed for TAL metals (EPA Methods 6010C/7470) and explosives (EPA Method 8330). The total number of surface soil samples to be collected for each MRS or MRA is subject to change depending on site conditions.

A UXO Technician II will be present as part of the field team and anomaly avoidance techniques will be used to identify an area or areas where a sample(s) can be collected safely.

Trench Warfare Range MRS

Up to 5 surface soil samples will be collected within the site at locations that will be field determined based upon the results of the magnetometer-assisted visual site survey and field conditions. If any surface MEC is found, one or more of the 5 samples may be relocated to these locations. If no surface MEC is encountered, representative soil samples will be biased towards areas where there is the greatest potential of detecting MC, i.e., a high concentration of anomalies, in suspect areas, or from arbitrary locations that will be field determined.

AAA Firing Point "A" MRS portion of the AAA Complex MRA

Up to 5 surface soil samples will be collected from the former firing points at the AAA Firing Point "A". If any surface MEC is found, one or more of the 5 samples may be relocated to these locations. If no surface MEC is encountered, representative soil samples will be biased towards areas where there is the greatest potential of detecting MC, i.e., a high concentration of anomalies, in suspect areas, or from arbitrary locations that will be field determined.

Field quality control/quality assurance (QA/QC) samples consisting of matrix spikes and matrix spike duplicates (MS/MSDs), duplicates, and splits will also be collected from the sites (see **Section 4.6**). The samples will be collected using proper field QC procedures and analyzed according to the procedures stated in the Quality Assurance Project Plan (QAPP) (**Appendix B to the WP**). The field sampling for MC in this SI effort is not expected to determine the nature and extent of all contaminants.

Each sampling location will be disturbed as little as possible, and will be left in its original condition with no debris or litter left behind.

Sample chemical analyses are discussed in greater detail in the QAPP, which can be found in **Appendix B to the WP**.

4.3 Field Equipment

As shown in **Table 4** below, a variety of equipment will be used to perform the field activities for this SI.

Table 4: Field Equipment

Category	Equipment
Surface Soil Sampling	Disposable scoops (or similar), stainless steel bowls, coolers, ice, sample bottles
Health and Safety Equipment	First aid kit, fire extinguisher, protective clothing, Nitrile gloves (Conform brand or equivalent)
Shipping	Packaging tape, labels, seals, Chain-of-Custody (COC) forms, ice, Ziploc bags, coolers, bubble wrap, packaging material
Documentation	Daily Quality Control Report (DQCR) forms, field log book, all applicable health and safety forms
MEC Detection, Avoidance, and Marking	Magnetometer, Global Positioning System (GPS), Camera, Pin Flags

4.4 Soil Sampling Procedures

Surface soil grab samples will be collected for metals analyses using a disposable scoop or similar equipment while wearing Nitrile gloves. New scoops and gloves will be used at each sampling location. Multi-increment (composite) samples will be collected for explosives analyses using the 7-Sample Wheel method following the guidelines in Cold Regions Research and Engineering Laboratory's (CRREL's) Special Report (SR) 96-15, *Assessment of Sampling Error Associated with Collection and Analysis of Soil Samples at Explosives-Contaminated Sites;* however, based upon the data quality objectives (DQOs) of this SI, the samples will not be ground or sieved. All of the investigative analytical, MS/MSDs, duplicates, and split samples will be collected, homogenized in a stainless steel bowl, divided into equal parts then placed in sample containers. The containers will then be labeled and placed in an ice chest chilled to a maximum temperature of 4 degrees Celsius (°C). After all samples are collected for a given shipment (which will be held refrigerated over the period of sampling), the COC form will be filled out (see **Section 5** for more details). Detailed sampling procedures can be found in the QAPP (**Appendix B of the WP**).

4.5 Laboratory Analyses

The analytical methods are selected on the basis of the munitions items suspected to have been used at each MRS/MRA and include the standard suite of range-related analytical parameters to account for

unknown items. The standard analytical methods include TAL Metals (EPA Methods 6010C/7470) and Explosives (EPA Method 8330). All analyses will be completed in accordance with EPA SW-846. Laboratory analysis procedures are discussed in greater detail in the QAPP (**Appendix B to the WP**).

Table 5 below shows the sample container and preservation requirements and **Table 6** below details the quantities of analyses to be performed.

Table 5: Sample Containers and Preservation Requirements

Analysis	Sample Container	Holding Time	Preservative
TAL Metals (EPA Methods 6010C/7470)	2 x 8 ounce wide mouth glass jars with Teflon-lined caps	180 Days	4°C
Explosives (EPA Method 8330)	2 x 8 ounce wide mouth glass jars with Teflon-lined caps	14 days to extraction, 40 days for analysis	4°C

Table 6: Quantities of Analyses

Trench Warfare Range						
Analysis	Media	Field Samples	Spikes (MS/MSD pair)	Field Duplicates	Splits	Total Number of Analyses
TAL Metals (EPA Methods 6010C/7470)	Surface Soil	5	1	1	1	8
Explosives (EPA Method 8330)	Surface Soil	5	1	1	1	8
Totals		5	1	1	1	8

AAA Complex (Firing Point "A")						
Analysis	Media	Field Samples	Spikes (MS/MSD pair)	Field Duplicates	Splits	Total Number of Analyses
TAL Metals (EPA Methods 6010C/7470)	Surface Soil	5	0	0	0	5
Explosives (EPA Method 8330)	Surface Soil	5	0	0	0	5
Totals		5	0	0	0	5

4.6 Quality Assurance/Quality Control (QA/QC)

e²M will meet the project-specific DQOs for sampling, analysis, and QA/QC by collecting the proper quantities and types of samples, using the correct analytical methodologies, implementing field and laboratory QA/QC procedures, and using various data validation and evaluation processes. Laboratory requirements for the analytical methods being used for this project and DQOs for each analytical method are included in the QAPP (**Appendix B of the WP**).

Field QC will be performed for sample collection, shipping, and handling. In an effort to achieve the highest level of QC, one time use, and disposable sampling equipment will be used for surface soil sampling, where appropriate. This type of equipment includes sampling gloves, scoops, and pre-cleaned sample jars.

Sample QC for the analytical samples will be assessed through the use of duplicate samples. Duplicate samples are used to evaluate field precision of the samples. QA will be assessed using split samples. Split samples are used to evaluate the contractor's laboratory performance. To obtain a duplicate or split sample, field samples are collected and the soil is homogenized in a stainless steel bowl, divided into two equal parts, and each half is containerized. Duplicate samples are sent to the designated contractor laboratory (PEL Laboratories, Inc.) for analysis. Protocol for split samples designates one half of the sample is sent to the designated contractor laboratory (PEL Laboratories, Inc.) and the other half is sent to another laboratory (Severn-Trent Laboratories, Inc.). See **Table 6** above for the quantities of QA & QC samples.

A MS/MSD will also be collected for each analyses. A sample will be picked in the field to be used for the MS/MSD. The sample will be homogenized in a stainless steel bowl and will be split into thirds and separated into three sample containers for each analyses: one for the sample itself, one for the MS, and one for the MSD, and the sample containers will be labeled accordingly. The MS/MSD is used by the laboratory to measure matrix interference.

All analytical data will be reviewed in accordance with the procedures provided in the QAPP (**Appendix B of the WP**).

5.0 FIELD OPERATIONS DOCUMENTATION

Field documentation will include DQCRs, field notebooks, sample labels, and COC forms. All field documentation will be completed in indelible ink. Corrections will be made by drawing a single line through the text, legibly writing the correction, and placing the person's initials and date next to the correction.

5.1 Daily Reports

A DQCR form will be prepared by the e²M FPM each day that field work is performed, commencing with the first day work is performed onsite. All workdays will be documented by this report throughout the duration of the field work. e²M will provide DQCRs to the CENWO-PM and e²M TPM by e-mail at the end of each day during the field work effort. A sample DQCR form can be found in **Attachment A**.

At a minimum, the DQCR will include:

a. Date,
b. Location of the work,
c. Weather information,
d. Sampling performed (including specifics such as location, type of samples, depth, etc.),
e. Problems encountered and corrective actions taken (including specifics regarding sampling problems and alternate sampling methods utilized),
f. Quality control activities,
g. Verbal or written instructions,
h. Types of tests performed, samples collected, and personnel involved,
i. Names of all personnel on-site including title and affiliation,
j. Equipment used,
k. Health and safety considerations,
l. Deviations from the work plan,
m. General and special remarks,
n. General observations, and
o. Signature and job title of the DQCR preparer.

5.2 Field Note Books

Field notes regarding all sampling and field activities will be kept in a bound notebook with pre-numbered pages. Indelible ink will be used for all entries. The field notes will be filled out while the field work is taking place, and will include all of the information that is reported on the DQCR forms.

5.3 Sample Numbering Scheme

A sequential sample numbering scheme will be used at each site if soil samples are collected. Each sample number will identify the site, sample location, and a sequential number. The project sample numbers will follow the example below:

FTSH-TRWR-R01

Where:

FTSH – 4 character designation for Fort Sheridan,

TRWR – 4 character designation for the specific MRS (**Trench Warfare Range**), and

R01 – 3 character designation of the sequential sample number, R for "random" sample and followed by the corresponding sample number.

5.4 Sample Labels

Correct sample labeling and the corresponding notation of the sample identification numbers in the field notebook, DQCR, and on the COC forms will be utilized to prevent misidentification of samples and their eventual results. All sample labels will be completed legibly with indelible ink. The labels will be affixed to the sample bottle and covered with clear tape.

The sample labels will include the following at a minimum:

a. Project name,
b. Company name,
c. Sample Identification,
d. Name/Initials of the collector,
e. Date and time of collection,
f. Sample location and depth,
g. Analysis required, and
h. Preservatives added.

5.5 Chain-of-Custody (COC)

The COC procedures will be in accordance with USACE Sample Handling Protocol and USEPA procedures. COC procedures are used to document and track samples from collection through

reporting of analytical results, and serve as permanent records of sample handling and shipment. Strict COC protocol will be maintained for all samples collected during this project. The COC forms will be filled out with indelible ink by the e²M FPM, and any mistakes made will be crossed out with a single line and initialed and dated.

The information on the COC form will include the following:

a. Sample identification numbers,

b. Date and time of sample collection,

c. Project name and number,

d. Number of sample containers,

e. Analyses required,

f. Turn around time required,

g. Preservatives used, and

h. Signatures of all parties who had possession of the samples.

COC forms will be completed for every cooler, and will be sealed in a resealable bag and taped to the inside of the lid of the cooler. The e²M FPM will keep one copy of the COC form. The laboratory will then sign the COC upon accepting the samples for analysis. Copies of the COCs will be faxed or mailed to the CENWO-PM upon completion of the field sampling effort.

6.0 SAMPLE PACKAGING AND SHIPPING REQUIREMENTS

All of the analytical samples will be placed in the appropriate sample containers, preserved as required, and will meet the respective holding times as specified in **Table 5** of this FSP; in the QAPP (**Appendix B to the WP**); and in EPA SW-846, 3rd Edition.

For analytical samples, each sample jar will be placed into a resealable bag in order to minimize potential for cross-contamination. The sample jars will then be placed into a hard plastic cooler pre-chilled to 4°C or less with double-bagged ice. Sample jars will be separated by at least one inch of space, and voids will be filled with packaging material, or the sample jars will be wrapped in bubble wrap. Each cooler will then be sealed shut with strapping tape, custody seals will be placed on the front and rear side of the cooler lid and covered with clear tape, "This Side Up" and "Fragile" labels will be put on the cooler, and the cooler will be sent via an overnight delivery service to the laboratory.

7.0 INVESTIGATIVE DERIVED WASTES

Excess soil will be returned to the sample hole for backfill purposes immediately after completion of sampling. If insufficient material is present to backfill the boring, soil from the surrounding area will be used to backfill the remainder of the sample hole.

Used gloves, and any other disposable sampling equipment or personal protective equipment (PPE) will be double bagged and disposed of off site as non-hazardous waste.

Daily Quality Control Report

Date: _____

Day	S	M	T	W	TH	F	S

Weather	Bright Sun	Clear	Overcast	Rain	Snow
Temp	To 32	32-50	50-70	70-85	85 up
Wind	Still	Moderate	High	Report No.	
Humidity	Dry	Moderate	Humid		

IMS Project Manager: _____
Project: _____
Project No.: _____

IMS Personnel:
Visitors Present:
Subcontractor Personnel:
Work Performed/Sampling Activities:

Sheet _____ of _____

Project _____ Report No. _____
Project No. _____ Date _____

Quality Control Activities (including field calibrations):

Health and Safety Levels and Activities:

Problems Encountered/Corrective Actions Taken:

Downtime/Standby:

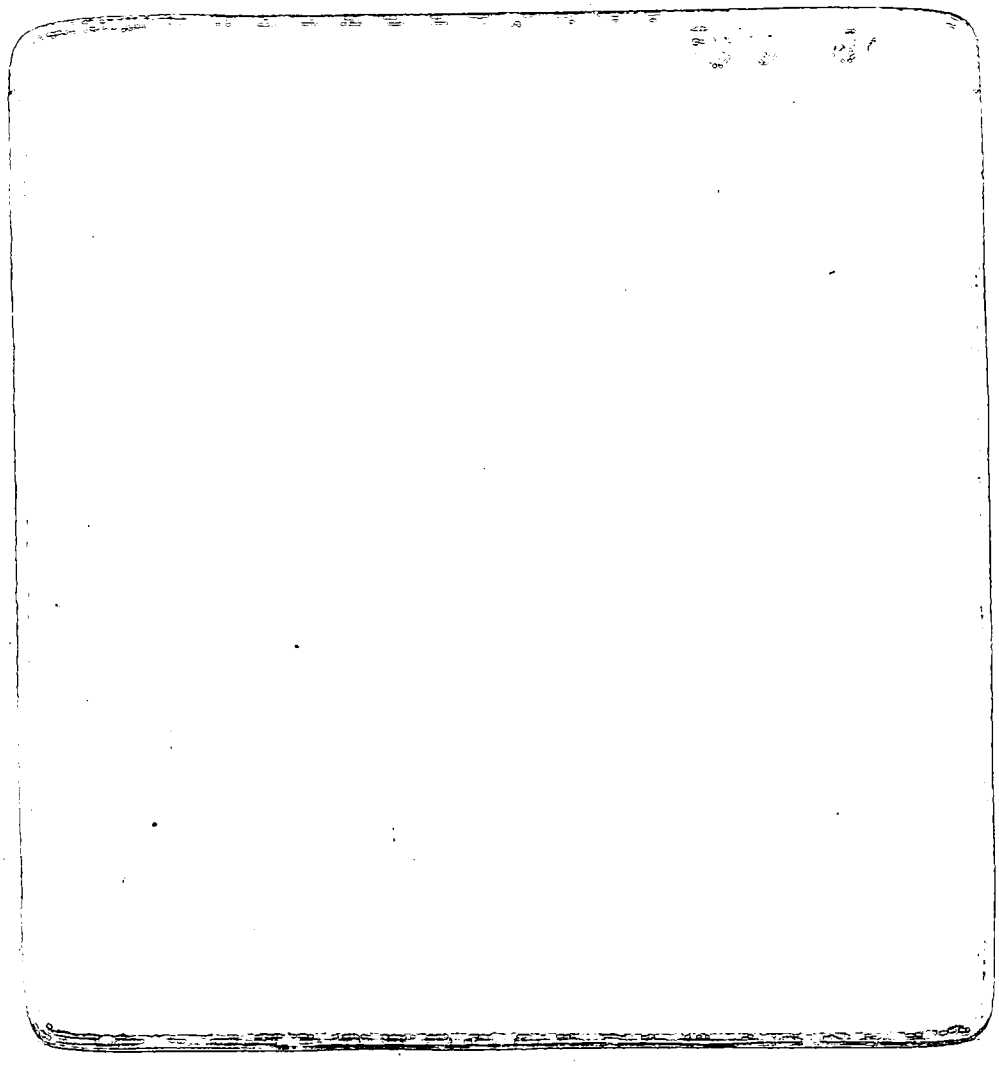
Special Notes:

By _____ Title _____

Sheet _____ of _____

Appendix B

Quality Assurance Project Plan



FINAL
SITE-SPECIFIC SAFETY AND HEALTH PLAN
MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
MUNITIONS RESPONSE SITES

FORT SHERIDAN, ILLINOIS

Submitted To:

US ARMY CORPS OF ENGINEERS
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CENWO-PM-HC
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Contract Number DACA-45-02-D0010
Task Order 003

MARCH 2006

SIGNATURE PAGE

engineering-environmental Management, Inc.

FINAL
SITE-SPECIFIC SAFETY AND HEALTH PLAN
MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
MUNITIONS RESPONSE SITES

FORT SHERIDAN, ILLINOIS

March 2006

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HOSPITAL LOCATION
Fort Sheridan, IL

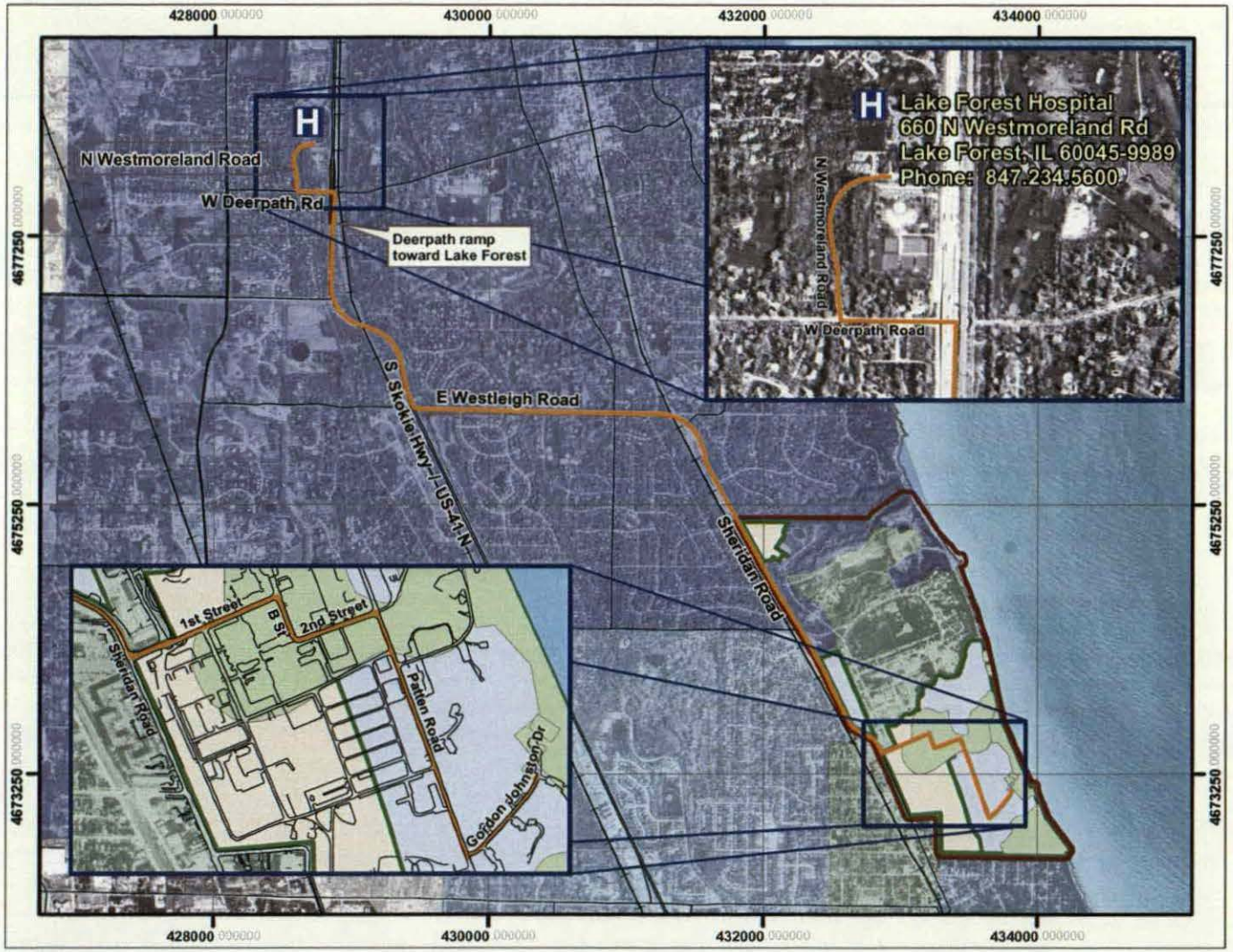

Figure 1

N
W E
S

- Route to Hospital
- Major Road
- Railroad
- Water
- U.S. Army Reserve
- U.S. Navy

Municipality

- Highland Park
- Highwood
- Lake Forest
- Village, Unconsolidated

Area Status

- MRS

Projection: UTM Zone 16
Datum : NAD 83
Units: Meters
Grid: 2000 Meter

1:50,000

0 1,000 2,000 3,000 4,000 5,000 Feet
0 500 1,000 1,500 Meters

Installation Location
Illinois

SITE-SPECIFIC SAFETY AND HEALTH PLAN
FORT SHERIDAN, IL

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: March 2006
Edition: Final

EMERGENCY REFERENCE LIST

Medical Emergencies:

Hospital Name:
Lake Forest Hospital
660 North Westmoreland Road
Lake Forest, IL 60045-9989
847-234-5600
847-535-6150 (Emergency)

Distance:
5.6 miles - **See Attached Map (Figure 1)**

Emergency Services:

Ambulance / Fire Department / Police:	**911**
Lake Forest Police Department:	**847-234-2601**
Lake Forest Fire Department:	**847-234-2601**
Illinois Department of Public Health (Illinois Only):	**800-782-7860 or**
Illinois Department of Public Health (Out of State):	**217-782-7860**
National Response Center:	**800-424-8802**

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Title	Name	Phone
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e²M Health & Safety Director	Rob Klawitter	303-721-9219 (w) 303-748-6615 (c)
e²M Technical Project Manager	Courtney Ingersoll	757-643-7886 (w) 757-999-3506 (c)
e²M Field Project Manager/ Site Safety Coordinator	Kevin Sedlak	210-348-6000 (w) 210-379-9719 (c)
Malcolm Pirnie UXO/Geophysical Contractor	Steve Burhans	443-804-7448 (c)
Fort Sheridan BRAC BEC	Dr. Kurt Thompsen	847-266-6323 (w) 262-880-5272 (c)

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ATTACHMENT A SAFETY AND HEALTH PROJECT FORMS

1.0 INTRODUCTION

1.1 Project Description

engineering-environmental Management, Inc. (e^2M) has prepared the following Site-specific Safety and Health Plan (SSHP) for the Site Inspection (SI) of the other than operational ranges and other sites with known or suspected unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC) at Fort Sheridan, Illinois. These Munitions Response Sites (MRSs) are being addressed under the Military Munitions Response Program (MMRP). e^2M is under contract with the United States Army Corps of Engineers (USACE), Omaha District through Contract Number DACA-45-02-D0010, Task Order 003. This SSHP is presented as an appendix to and is considered part of the Work Plan (WP) for Fort Sheridan.

The purpose of this SSHP is to ensure safe and healthy working conditions for all team members. The safety and health organization and procedures contained in this SSHP have been established based upon an analysis of the potential hazards. Personnel protection measures are based on the risks associated with these hazards. This SSHP provides detailed descriptions of safety and health procedures to be followed in the field during the performance of this project to minimize the risk of injury to project personnel. It is anticipated that the field work will take place during April 2006 and will last approximately one day, excluding mobilization and demobilization. The content of this SSHP may change or undergo revision based upon additional information made available to safety and health personnel or due to changes in the technical scope of work.

This SSHP has been prepared in conformance with: e^2M's Health and Safety program, policies and procedures, as well as the guidelines established in the following documents: Data Item Description (DID) MR-005-06 Accident Prevention Plan; USACE Safety and Health Requirements Manual, EM 385-1-1; USACE Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW), ER 385-1-92; USACE OM 385-1-1; and applicable sections of 29 Code of Federal Regulations (CFR) 1910.120 and 29 CFR 1926.65.

This SSHP contains the requirements for protection of site personnel and the general public during work activities at Fort Sheridan and will be implemented by the e^2M Site Safety Coordinator (SSC) during site work. Specific tasks that will be conducted at Fort Sheridan include:

- Mobilization/Demobilization;

- Magnetometer-assisted visual surveys, and
- Surface soil sampling for primary MC (metals and explosives).

No intrusive activities or excavations will be performed; if any suspect munitions and explosives of concern (MEC) at the surface are discovered they will be visually evaluated by a trained UXO Technician II to determine if they are MEC or munitions debris. This will be done to ensure the field crew's safety during the surveys. All discovered MEC will be reported to the USACE, Omaha Project Manager (CENWO-PM); Dr. Kurt Thomsen, Fort Sheridan Base Realignment and Closure (BRAC) Environmental Coordinator (BEC); and the e²M Technical Project Manager (TPM) for determination of the appropriate action to be taken.

Besides the collection of surface soil samples, only visual inspections and limited identification of potentially hazardous surface items are proposed for the field work under this SI. If MEC or suspect material are encountered, the team will stop; flag the location (using anomaly avoidance techniques); record the position with Global Positioning System (GPS); make field notes indicating the general location of the item or suspect area, its condition, and any other pertinent information; take a photograph of the item or suspect area; and notify the parties stated above.

All e²M employees, subcontractors, and visitors who may participate in activities at Fort Sheridan are required to comply with this SSHP. Refusal or failure to comply with the SSHP or violation of any safety procedures by field personnel, including subcontractors, may result in their immediate removal from the site following consultation with the e²M TPM.

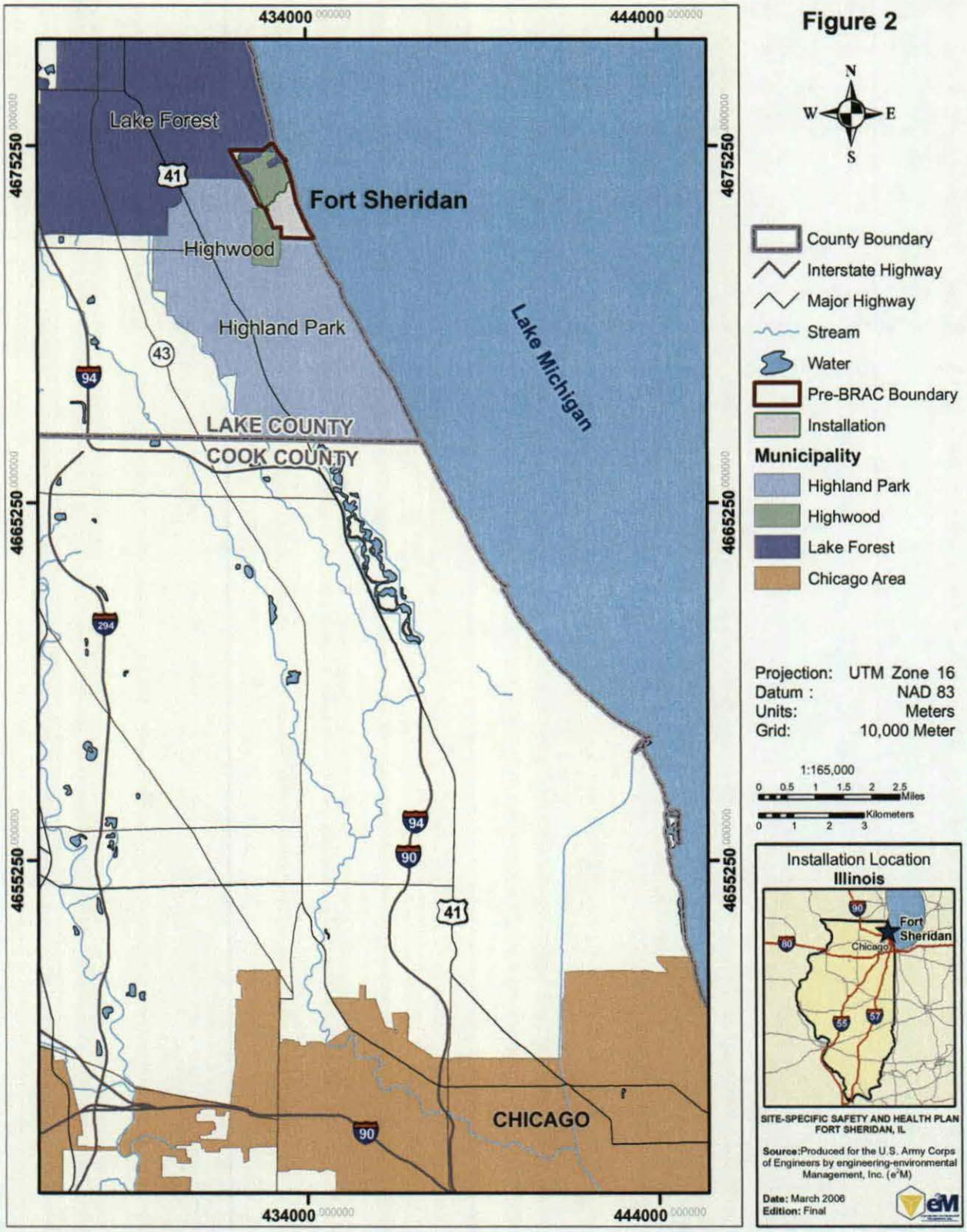
This SSHP will be used with the understanding that site-specific conditions may dictate a change in the plan as written; however, any necessary deviations from the plan will be reported to the CENWO-PM and e²M TPM, documented, and maintained as an attachment to this plan. Any changes made to this plan in the field will be documented on the e²M Record of Change form (**Attachment A**).

1.2 Installation and MRSs

Fort Sheridan (Federal Facility Identification number: IL2104IL131) is located along the southwestern shore of Lake Michigan in the State of Illinois and encompasses approximately 712 acres of land. (See **Figure 2**: Installation Location Map.) Fort Sheridan was established in 1887 to serve as an infantry post to help stabilize the City of Chicago following the Great Chicago Fire in 1871 and rioting by its citizens associated with labor problems (e²M, 2002; USACE, 1996). Fort Sheridan was operational between 1887 and 1993 and "provided training facilities for US Army troops participating in the Spanish-American

INSTALLATION LOCATION
Fort Sheridan, IL

Figure 2



War (1898), the Mexican Intervention of 1913, World War I (1917), World War II (1940), and was established as a Nike missile launch site in the 1950s" (SAIC, 1999).

"Between 1967 and 1993, operations at Fort Sheridan were primarily administrative, with the Post serving alternately as headquarters for the Fifth Army, the US Army Recruiting Command, the Fourth Army, and also providing administrative and logistical support to 74 US Army Reserve centers located in Midwestern states from Minnesota to Michigan" (SAIC, 1999).

The MRSs and munitions response areas (MRAs) that are the focus of the SI include the Trench Warfare Range MRS, the Anti-Aircraft Artillery (AAA) Complex MRA, the AAA Complex – Transferred (TD) MRS, the Grenade Course MRS, and the Small Arms Range Complex MRA (**See Figures 3-3 and 3-4 of the WP**). However, field work will only take place during this SI at the Trench Warfare Range MRS, and the AAA Firing Point "A" MRS portion of the AAA Complex MRA.

2.0 SITE CHARACTERIZATION

2.1 Trench Warfare Range MRS (FTSH-001-R-01)

The Trench Warfare Range MRS (Army Environmental Database-Restoration [AEDB-R] Number FTSH-001-R-01) is located in the southern portion of Fort Sheridan south of Bartlett Ravine Road and surrounds Van Horne Ravine. The 53.1 acre MRS was used between 1917 and 1919 to train military personnel for trench warfare during World War I (WWI). The trenches were dug in and around Van Horne Ravine. The trenches were filled in sometime after WWI, but the exact date is unknown (USACE, 1996). (**See Figures 3-4 and 3-5 of the WP** for the layout of the Trench Warfare Range MRS). The outline for the Trench Warfare Range used in the 2002 Phase 3 US Army Closed, Transferring and Transferred (CTT) Range/Site Inventory Report has been updated to reflect the most accurate historical drawings of the trenches found in the 1996 Archive Search Report (ASR) (**see Appendix B of the Historical Records Review [HRR]**). Discussions with personnel from the USACE indicated that the updated outline for the Trench Warfare Range is more accurate. The acreage of the MRS was designated in the 2002 Phase 3 US Army CTT Range/Site Inventory Report as 42.5 acres; however, since the MRS was expanded to include the US Navy property, and the site boundary from the 2002 Phase 3 US Army CTT Range/Site Inventory was updated, the boundary of the MRS has changed and the MRS now comprises 53.1 acres.

According to the ASR, it is believed the trenches were approximately six feet deep. After the trenches were filled in, they were built upon and the ground surface was raised leaving the bottom of the trenches more than six feet below the ground surface (bgs). There are currently office buildings, parking lots, and maintenance facilities at the site. There is also some recreational usage of the land. Landfill 5 is located in the northwest part of the MRS and covers 1.4 acres. It was used from approximately 1900 through the 1960s. "This former landfill is located in a light industrial area in Fort Sheridan and is surrounded by warehouse facilities (Kemron, 2003a)." The landfill contained "construction debris with large concrete blocks, rebar, metallic debris, slag, bricks, ash, glass, bottles, copper pipes and wires, automotive parts, asphalt, wood, wire, nails, and coal fragments (SAIC, 1999)." The landfill is currently used for vehicle and equipment storage and shop activities. Most of the site is fenced and overlain by concrete, asphalt, and grass (Kemron, 2003a).

The presence of MEC is possible but not probable at the Trench Warfare Range due to extensive erosion in the area, and further investigation has been recommended; therefore, a magnetometer-

assisted visual survey will be conducted at this site during the field work portion of this SI to assist with the collection of surface soil samples. Because the survey will be conducted in and around Van Horne Ravine, a meandering path approach will be followed.

2.2 AAA Complex MRA (AEDB-R Number to be determined [TBD])

This MRA is composed of five separate MRSs: the AAA Firing Points "A" and "B", the Small Arms Range, the Pistol Range, and the Machine Gun Range. Note: these latter three ranges overlap with Firing Point "A" in the southern portion of the installation. The AAA Firing Points "A" and "B" comprise 13.7 acres. The Small Arms Range covers 0.6 acres, the Pistol Range covers 0.3 acres, and the Machine Gun Range covers 0.1 acres. The total MRA covers 14.7 acres. **See Figures 3-4 and 3-6 of the WP** for the layout of the MRA.

From 1930 to 1944, Fort Sheridan hosted several battalions for anti-aircraft activity. The 61st Coast Artillery was transferred from Fort Monroe to Fort Sheridan in 1930. The 61st Coast Artillery had two gun battalions and an automatic weapons battalion. Personnel from the 61st Artillery also instructed reserve troops at Fort Sheridan. During World War II (WWII), 90millimeter (mm) and 40mm guns replaced 3-inch and 37mm guns. A US Army Air Defense Artillery school operated at Fort Sheridan between 1942 and 1944. This school had 8 automatic weapons battalions and 2 gun battalions in training in July of 1943. On 1 November 1944, Fort Sheridan was discontinued as a school (USACE, 1996).

The MRA was used by the 61st Coast Artillery as a fly-over target range for projectiles including: 37mm, 40mm, 90mm, 120mm, and Rocket Launcher 2.36-inch Anti-Tank (AT). Targets were usually towed over Lake Michigan (USACE, 1996). Site reconnaissance conducted by Malcolm Pirnie in 2003 around both firing points did not reveal any visible evidence of UXO, DMM or munitions related debris. The 1996 ASR indicates ordnance and explosives (OE) "has been found in the vicinity of the site", (Firing Point "B") including a 105mm cartridge case.

The AAA Area at Fort Sheridan had five firing points, labeled "A" through "E". Only firing points "A" and "B" were located on the current Navy property and qualified for the MMRP. Firing Points "C", "D", and "E" were located outside of the footprint of interest for this SI in the northeastern portion of Fort Sheridan close to the Lake Michigan shoreline on property that was transferred under BRAC to the Lake County Forest Preserve. "Location A was the original firing point, but, because of complaints from local residents, location B became the primary firing location (Harding ESE, 2001)." A portion of Firing

Point "B" overlaps with a portion of the Trench Warfare Range MRS, so the potential exits for munitions that were used in the trenches to be present at Firing Point "B".

Firing Points "A" and "B" make up approximately 13.7 acres and were located on the bluff and in the ridges of the southeastern portion of Fort Sheridan and were used from around 1930 to approximately 1950. Targets for this range were located both on the bluff and in Lake Michigan; therefore, part of this range fan is a water range. The range fans that extend over Lake Michigan are no longer used by DoD and they are a separate site (AAA Complex –TD MRS).

The Small Arms, Pistol, and Machine Gun Range MRSs are three separate ranges comprising approximately one acre. The ranges were used from approximately 1891 to 1950. Only small arms of 0.50 caliber or less were used at the ranges (Malcolm Pirnie, 2003). During site reconnaissance, no evidence of small arms ammunition was found at the sites (USACE, 1996 and Malcolm Pirnie, 2003).

AAA Firing Point "A" MRS portion of the AAA Complex MRA

The presence of MEC is possible at the AAA Firing Point "A" MRS portion of the AAA Complex MRA, and further investigation has been recommended; therefore, a magnetometer-assisted visual survey will be conducted at this site during the field work portion of this SI to assist with the collection of surface soil samples.

Small Arms, Pistol, and Machine Gun Range MRS portions of the AAA Complex MRA

Based upon the findings of the HRR and discussions with the Fort Sheridan Army Reserve Complex (FSARC) stakeholders, MEC and MC are not likely at the Small Arms, Pistol, and Machine Gun Range MRSs within the AAA Complex MRA; therefore, no field work will be conducted on these MRSs during this SI.

3.0 HAZARD/RISK ANALYSIS OF FIELD ACTIVITIES

A hazard analysis was performed for the field work activities that will be conducted during the course of this project. Based upon review of the project scope, these include mobilization/demobilization, magnetometer-assisted visual surveys, and surface soil sampling for primary MC (metals and explosives). The potential hazards associated with the site activities include contact with chemical hazards, MEC hazards, biological hazards, and injury from general physical hazards. The potential for encountering various physical hazards is dependent upon the work activity being performed and the location of that activity. Physical hazards such as cold stress, noise, and or hazard due to operation of a motor vehicle, use of heavy equipment, power tools, etc., may be present depending upon the work being performed. **(Note: No intrusive activities are planned for Fort Sheridan. Heavy equipment and power tools will not be used under the proposed field work activities.)** Biological hazards may vary depending on the time of year. **Table 3-1** below summarizes the potential hazards that may be encountered during the course of the SI field work.

Table 3-1: Potential Hazards

Chemical Hazards					
x	Munitions Constituents (MC)	x	Volatile Organic Compounds (VOCs)		Decontamination Fluids/Cleaners
x	Metals	x	Semi-Volatile Organic Compounds (SVOCs)		Unknown Compounds
	Chemical Agents	x	Fuels (gas, diesel, etc.)		Other
Physical Hazards					
x	MEC	x	Fire and Explosion		Heavy Equipment
x	Adverse Weather Conditions		Battery Charging and Storage		Hand Tools
	Heat Stress	x	Slips, Trips, and Falls		Excavation Operations
x	Cold Stress	x	Manual Lifting		Hazardous Atmospheres
	Noise (>85 dBA)		Electrical Hazards		Other
Biological Hazards					
x	Insect/Arachnid Bites & Stings		Wild Animals	x	Snake Bites
x	Plants	x	Bloodborne Pathogens (BBP)		Other

3.1 Chemical Hazards

3.1.1 Chemical Hazard Identification

Because of the wide range of potential MC and other chemical constituents that could be present at the MRSs, caution will be taken to provide the highest level of personnel protection for any type of MC.

Concentrations of lead detected in previously collected and analyzed soil samples at Fort Sheridan ranged from 60 micrograms/gram (µg/g) to 1400 µg/g. Otherwise, it is unknown if there are any, or what type of MC are present on the MRSs. Other chemical hazards are expected to be limited to chemicals brought to the sites by the UXO/Geophysical Contractor (Malcolm Pirnie), such as fuel for vehicles. The e²M Field Project Manager (FPM)/SSC will acquire Material Safety Data Sheets (MSDS) for all known chemicals brought onto the installation and will instruct team members on the safe handling of these chemicals.

Table 3-2 below summarizes the potential exposure pathway(s) for chemical constituents that may be encountered during the course of performing the SI field work.

Table 3-2: Summary of Chemical Exposure Pathways

Anticipated Physical State Of Contaminant(s):			
( ) Liquid	( ) Sludge	(x) Dust or Fiber	
(x) Solid	( ) Gas/Vapors	( ) Other	
Notes: MC are anticipated to be a fractional component of the soil matrix.			
Matrix:			
(x) Surface soils	(x) Surface water	( ) Free product	( ) Other
(x) Soils at depth	(x) Ground water	(x) Sediment	
Notes: Surface and subsurface soil may contain concentrations of MC. Groundwater, surface water and sediment may have been impacted but will not be encountered during the course of performing the SI field work.			
Potential Hazardous Properties:			
( ) Corrosive	(x) Flammable/Combust.	( ) Radioactive	
(x) Toxic	(x) Volatile	( ) Reactive	
( ) Compressed gas	(x) Carcinogenic	(x) Unknown	
( ) Asphyxiant	(x) Explosive	( ) Other	
Notes:			
Container/Storage System Information:			
( ) Tanks	( ) Landfills/Dumps	( ) Subsurface	
( ) Drums	( ) Impoundments	( ) Un-containerized	
( ) Pipes	( ) Size/capacity	(x) In-Service	
( ) Quantity	(x) Surface	( ) Other	
Notes:			

Table 3-2: Summary of Chemical Exposure Pathways, continued

Condition Of Container/Storage System(s):			
(x) Sound/Undamaged	( ) Confirmed leaks	( ) N/A	
( ) Deteriorated/Unsound	( ) Suspected leaks	( ) Unknown	
( ) Other			
Chemicals Used or Identified:			
( ) Acids	(x) Metals	(x) Petroleum	( ) PCBs
( ) Caustics	( ) Pesticides	( ) Paints	( ) N/A
( ) Halogen	(x) Explosive Residues	( ) Solvents	
Notes: The presence of metals and explosives is possible.			
Oils/Fuels:			
( ) Fuel Oil	( ) AVGAS	(x) Gasoline	
( ) Waste Oil	( ) MOGAS	(x) Diesel	
(x) Hydraulic Oil	( ) Jet Fuel	( ) N/A	
Notes: Gasoline, diesel, and hydraulic oil are contained within vehicles that are not anticipated to be brought on site.			
Sludges:			
( ) Metal sludge	( ) Oily sludge	( ) Septic sludge	
( ) Other	(x) N/A		
Notes:			
Solids:			
( ) Asbestos	( ) Sandblast grit	(x) Landfill refuse (anomalies)	
( ) Silica Sand	(x) N/A		
Notes:			

Table 3-3 below provides risk-based exposure limits for each of the potential chemicals of concern that may be encountered at the MRSs, as well as routes of exposure and the resultant symptoms.

Table 3-3: Potential Chemical Hazards of Concern

Contaminant	OSHA PEL[1]	NIOSH REL[2]	ACGIH TLV[3]	IDLH[4]	Route of Exposure	Symptoms of Exposure
Arsenic	0.01 mg/m^3	0.002 mg/ m^3	0.01 mg/m^3	5 mg/m^3	Inhalation, ingestion, skin contact	Initial symptoms include burning lips, constriction of the throat, and dysphagia followed by excruciating abdominal pain, severe nausea, projectile vomiting, and profuse diarrhea.
Lead	0.050 mg/m^3	0.100 mg/m^3	0.15 mg/m^3	100 mg/m^3	Inhalation, ingestion, skin contact	Symptoms include nausea, fatigue, headache, and fine tremors of the hand. Prolonged exposure can affect the brain, kidneys and liver and has been shown to cause anemia, hearing loss and high blood pressure.

(1) Occupational Safety and Health Administration Permissible Exposure Limit, (2) National Institute of Occupational Safety and Health Recommended Exposure Level, (3) American Conference of Governmental Industrial Hygienists Threshold Limit Value, (4) Immediately Dangerous to Life and Health

3.1.2 Chemical Hazard Mitigation/Prevention

On site, the primary entry routes for the potential chemical contaminants include inhalation of dust, absorption of chemicals through skin contact, and ingestion of airborne dusts or chemicals through hand-to-mouth contact. To minimize these exposure pathways, all field personnel will be required to don personal protective equipment (PPE) including gloves, safety glasses, and sleeved shirts when the potential for incidental contact with contaminated media is anticipated. Smoking, drinking, and eating will not be allowed within the work area. Due to the types of potential contaminants or the proposed controls being implemented during the field work, air-borne contaminants are not anticipated to be encountered.

3.2 Physical Hazards

3.2.1 Munitions and Explosives of Concern (MEC)

3.2.1.1 MEC Hazard Identification

The munitions that may be encountered at the MRSs or MRAs are unknown. MEC is possible but not probable at the Trench Warfare Range due to extensive erosion in the area. The AAA Complex MRA was used for firing points by the 61st Coast Artillery as part of a fly-over target range for projectiles including: 37mm, 40mm, 90mm, 120mm, and Rocket Launcher 2.36-inch AT.

3.2.1.2 MEC Hazard Mitigation/Prevention

Only UXO trained personnel are authorized to investigate and handle MEC. The hazards presented by MEC have the potential to kill or cause serious injury if improperly handled. Operations involving MEC are inherently dangerous and require strict adherence to safe practices, safety procedures, and positive control of personnel. Recognition and avoidance training of MEC will be provided to all on-site personnel. Due to the variety of MEC items that may be encountered, all site workers must be vigilant in identifying hazards at the work site and bringing them to the attention of supervisory personnel. As additional hazards are identified, appropriate protective measures will be implemented.

A UXO Technician II will conduct magnetometer-assisted visual surveys at the sites to detect surface items only. An item is considered a surface item if any portion of the item is above the ground. A Schonstedt handheld magnetic gradiometer (or similar device) will be used to assist in locating ferrous metallic items on the ground surface. The UXO Technician II will visually sweep his search area to locate metallic objects that may be metallic debris, MEC or munitions debris.

When an MEC item is located, the item will be marked with a pin flag and examined by a UXO Technician II to determine its identity and condition. The position of the MEC item will be determined using the GPS navigation system. Digital photos of all live MEC and significant inert MEC or munitions debris will be taken and reported to the USACE-PM; Dr. Kurt Thomsen, Fort Sheridan BRAC BEC; and the e²M TPM; and if the MEC is determined to present a danger to human health or the environment, the Fort Sheridan POC (Dr. Thomsen) will be responsible for contacting the City of Waukegan Fire Department at (847) 249-5410 (business hours) or at (847) 599-2608 (after hours). Only visual inspection and limited identification of potentially hazardous surface items will be conducted by project personnel.

Soil samples will be collected if the UXO Technician II dictates site conditions to be safe for sampling. In the instance it is not safe, samples will be collected at the next best location.

3.2.2 Adverse Weather Conditions

3.2.2.1 Adverse Weather Hazard Identification

In the event of adverse weather conditions, the SSC or designee will determine if work can continue without potentially risking the safety of all field workers. Some of the items considered prior to determining if work should continue include:

- Extreme temperatures (> 100 degrees Fahrenheit [°F] or < 0°F);
- Treacherous weather-related working conditions such as hail, rain and high winds (> 30 miles per hour);
- Visible lightning within 10 miles;
- Limited visibility (fog); and
- High winds and tornadoes.

3.2.2.2 Adverse Weather Hazard Mitigation/Prevention

The SSC or designee is responsible for deciding if the contractor/subcontractor field activities should cease due to severe weather. In the event that work is suspended, the SSC will notify field personnel via radios or cellular telephones and inform them of suspended operations. The individuals in possession of the radio or cellular phone will be responsible for relaying the work suspension orders to other personnel assigned to their areas. All personnel will render the work place temporarily closed and proceed to the designated assembly areas for further instruction. Site activities will be limited to daylight hours and acceptable weather conditions.

3.2.3 Cold Stress

3.2.3.1 Cold Stress Hazard Identification

Exposure to low temperatures presents a risk to employee safety and health through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity and reduced dependability of equipment. Work conducted in the winter months can become a hazard for field personnel due to cold exposure. All personnel must exercise increased care when working in cold environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic cold exposure is referred to as hypothermia. Recognition of the symptoms of cold-related illnesses will be discussed during the health and safety briefing conducted prior to the onset of Site activities. Local cold exposure is generally labeled frostbite.

Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to approach 95°F. As hypothermia progresses, depression of the central nervous system becomes increasingly more severe.

Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20°F. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction. The three general categories of frostbite are:

- *Frostnip* - A whitened area of the skin that is slightly burning or painful.
- *Superficial frostbite* - Waxy, white skin with a firm sensation but with some resiliency. Symptomatically feels "warm" to the victim with a notable cessation of pain.
- *Deep frostbite* - Tissue damage deeper than the skin and at times, down to the bone. The skin is cold, numb and hard.

3.2.3.2 Cold Stress Hazard Mitigation/Prevention

In preventing cold stress, the SSC or designee must consider factors relating both to the worker and the environment. Training, medical screening, establishment of administrative controls, selecting proper work clothing and wind-chill monitoring all contribute to the prevention of hypothermia and frostbite. The following prevention methods should be implemented on-site to reduce cold stress exposure:

- Recognizing the early signs and symptoms of cold stress can help prevent serious injury. Thus, workers will be trained to recognize the symptoms of hypothermia and frostbite and have appropriate first-aid instruction. When the air temperature is below 50°F, the SSC or designee will inform workers of the proper clothing requirements and any work practices that are in effect to reduce cold exposure;
- Cold injury and illness recognition and prevention measures will be emphasized during daily safety briefings when the potential for cold injuries and illnesses exists;
- Work will cease under unusually hazardous conditions;
- Phenothiazine (a sedative) and beta-blocker drug use will be prohibited;
- A heated area will be available;
- Daily temperatures will be monitored;
- Warm beverages will be available; and

- Workers will be encouraged to layer clothing when air temperature is below 50°F. Clothing that has a high insulation value will be worn under protective garments. Insulated gloves will be worn when the wind chill index is below 32°F. Insulating dry clothes will be made available.

3.2.4 Noise

3.2.4.1 Noise Hazard Identification

Noise is a potential hazard associated with the operation of heavy equipment, detonations, power tools, pumps and generators. Excessive noise presents two potential problems at the site. First, it hinders communication between workers. Second, excessive noise exposures, both continuous and impact noise, can have adverse effects on a person's hearing. These adverse effects include both temporary and permanent hearing damage.

Note: No heavy equipment, power tool, pumps, or generators will be used during the field work portion of this SI, noise is not anticipated to be a hazard; however, ear protection in the form of disposable ear plugs will be available for use if needed.

3.2.5 Fire and Explosion

3.2.5.1 Fire and Explosion Hazard Identification

In cases involving MEC, unintended movement can cause accidental ignition and explosion. It is imperative to positively identify MEC by type and function prior to any movement. MEC should also be isolated from ignition sources to reduce the possibility of an explosion or fire. Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness, such as moving drums, mixing/bulking of site chemicals and during refueling of heavy or hand held equipment. Some potential causes of explosions and fires include:

- Mixing of incompatible chemicals, causing reactions that spontaneously ignite due to the production of both flammable vapors and heat,
- Ignition of explosive or flammable chemical gas/ vapors by external ignition sources,
- Ignition of materials due to oxygen enrichment,
- Agitation of shock or friction-sensitive compounds, and
- Sudden release of materials under pressure.

Note: Suspected MEC will not be moved and mixing of chemicals will not take place during this SI. The only proposed fuel on the MRSs/MRAs will be fuel contained in vehicles.

3.2.5.2 Fire and Explosion Hazard Mitigation/Prevention

Immediate Action

Upon detecting a fire, employees will determine whether the fire is small enough to readily extinguish with immediately available portable extinguishers or water, or if other fire-fighting methods are necessary. Non-essential personnel will be directed away from the area of the fire. If it is judged that a fire is small enough to fight with available extinguishing media, employees will attempt to extinguish the fire provided that:

- They are able to approach the fire from the upwind side, or opposite to the direction of the fire's progress;
- The correct extinguisher for the potential fire is readily available; and
- No known complicating factors are present, such as the likelihood of rapid spread, imminent risk of explosion or gross contamination.

Personnel leaving a fire area will account for all employees in that work area as soon as possible, and report to the SSC or designee performing a head count. At this point, the SSC or designee will contact the appropriate authorities.

In the case of an explosion, all personnel will immediately leave the area and assemble at the pre-designated assembly area. At this point, a head count of all site personnel will be conducted and the appropriate authorities notified.

Notification

The SSC, e²M TPM, and CENWO-PM will be notified as soon as possible of the location, size, and nature of the fire/explosion. As conditions dictate, the SSC or the TPM will declare an emergency, initiate remedial procedures and request assistance from the Fire Department by dialing **911**. Outside personnel responding to the fire/explosion may seek assistance from the SSC with regard to the routing of equipment within the incident site to the most favorable and safe position while minimizing and/or avoiding exposure to any site contaminants.

Rescue

If an employee(s) is unable to evacuate themselves from a fire/explosion area for any reason, their rescue will be the first priority of responders. The SSC will determine whether on-site resources are sufficient to proceed or if rescue must be delayed until the Fire Department responders arrive.

Fire Protection

To ensure adequate fire protection, the SSC will inspect the Sites to ensure all flammable and combustible materials are being safely stored in appropriately configured storage areas and containers. The SSC will also ensure no flammable/combustible materials are stored near any sources of ignition and that sources of ignition are removed a safe distance from storage areas. If needed, storage areas will be segregated from the remainder of the Sites through the use of flagging.

Note: The use of storage areas and containers are not anticipated during the conduct of this SI.

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation and flying objects, but may also cause the release of toxic chemicals into the environment. Such releases can threaten both personnel on-site and members of the general public living or working nearby. Site personnel involved with potentially flammable material or operations will follow the guidelines listed in EM 385-1-1, Section 9, to prevent fires and explosions. Because the storage or use of combustible, flammable, or explosive materials is not included in the project scope, the requirements of EM 385-1-1, Section 9, are not summarized in this SSHP.

Decontamination

At the conclusion of fire fighting activities, the SSC will:

- Determine, to the extent practical, the nature of the contaminants encountered during the incident.
- SSC will provide information to the emergency responders on the nature of potential contaminants present so that appropriate decontamination measures can be taken.
- Equipment not easily decontaminated will be labeled and isolated for further action, such as determining specific contaminants by wipe sampling or awaiting the delivery of specific decontamination media and supplies.

Fire Extinguisher Information

The four classes of fire, along with their constituents and respective proper extinguishing agents, are as follows:

Table 3-4: Fire Classes

Class	Constituents	Proper Extinguishing Agents
Class A	Wood, cloth, paper, rubber, many plastics, and ordinary combustible materials.	Water or ABC Dry Chemical
Class B	Flammable liquids, gases, and greases.	ABC Dry Chemical
Class C	Energized electrical equipment.	ABC Dry Chemical
Class D	Combustible metals such as magnesium, titanium, sodium, and potassium.	Metal-X Dry Chemical (not anticipated and not onsite.)

At least one portable fire extinguisher having a rating of not less than 2A:20:B-C will be located at each Site in a vehicle.

3.2.6 Battery Charging and Storage

3.2.6.1 Battery Hazard Identification

Lead-acid batteries (12 volt wet cell) are used in cars, trucks, motorcycles, boats, and other motorized equipment. Each battery consists of a polypropylene plastic case containing lead plates immersed in a sulfuric acid electrolyte.

Two primary hazards associated with lead-acid batteries are the formation of hydrogen gas when charging the battery and the sulfuric acid contained in the battery fluid. Failure to follow safe procedures for the charging and storage of batteries can be extremely hazardous.

Lead-acid batteries contain sulfuric acid, a corrosive that can burn and destroy the skin or other body tissues upon contact. Potential exposure may occur when pouring sulfuric acid or handling a leaking battery. Additionally, the eyes, respiratory tract or digestive system can be severely harmed if a worker gets a splash in the eyes, inhales sulfuric acid mist or accidentally ingests sulfuric acid.

Note: The only lead-acid batteries to be used during the field work portion of this SI are located on the vehicles. Charging of these batteries will not take place during the field work portion of this SI.

3.2.7 Slips, Trips and Falls

3.2.7.1 Slips, Trips and Falls Hazard Identification

Working in and around the MRSs or MRAs will pose slip, trip, and fall hazards due to slippery surfaces that are wet from rain, snow, or water. Slips, trips, and falls are a leading cause of injuries in field-related work settings, therefore, a concerted effort is needed to identify, control, and eliminate these hazards and ensure the measures needed to reduce or eliminate the possibility of injury are communicated to all Site personnel. Potential adverse health effects include falling to the ground and becoming injured or twisting an ankle.

3.2.7.2 Slips, Trips, and Falls Hazard Mitigation/Prevention

Site personnel will be instructed to look for potential safety hazards and immediately inform the SSC or designee about any new hazards. If the hazard cannot be immediately removed, action must be taken to warn site workers about the hazard.

3.2.8 Manual Lifting

Failure to follow proper lifting techniques can result in back injuries and strains. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time and long treatment and recovery periods.

Note: Manual lifting of heavy objects is not expected to occur during the course of the SI field work.

3.2.9 Electrical Hazards

Overhead power lines and downed electrical wires all pose a danger of shock or electrocution if workers contact or sever them during site operations. Electrical equipment and extension cords used on-site may also pose a hazard to workers. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death. Care will be taken to avoid all power lines.

Note: Intrusive activities will not be performed during the course of the SI field work. Therefore, site personnel will not come into contact with buried electrical utilities; however, personnel should be aware of overhead power lines.

3.2.10 Heavy Equipment

Certain site investigations require the use of heavy equipment. However, heavy equipment will not be used during the course of the SI field work and does not present a concern.

3.2.11 Hand and Power Tools

Hand and power tools can present many hazards including: flying objects and particles, cuts and punctures, having a body part caught in or between, electrocution, noise, fire and explosion and exposure to vapors, aerosols and dusts from exhaust. However, the use of power tools is not anticipated during the course of the SI field work.

3.2.12 Excavation Operations

Excavation operations will not be performed during the course of the SI field work.

3.3 Biological Hazards

The following biological hazards may be present at each site. The SSC will instruct the field crew in recognition and procedures for encountering biological hazards.

3.3.1 Insect/Arachnid Bites and Stings

3.3.1.1 Bites and Stings Hazard Identification

Insects, including bees, wasps, hornets, scorpions, and spiders may be present at each MRS or MRA making the chance of a bite very possible. Some individuals may have a severe allergic reaction to insect or arachnid bites or stings that can result in a life threatening condition. Personnel with severe allergic reactions to insect or arachnid bites or stings will notify the field team of their allergy prior to the conduct of field work. Various spiders may be encountered at Fort Sheridan, however, only two spiders in the area are poisonous –the Black Widow and the Brown Recluse. The striped bark scorpion is the only scorpion species found in Illinois.

Both Lyme disease and Rocky Mountain Spotted Fever (RMSF) are caused by bites from infected ticks that are common in and near wooded areas, tall grass and brush. Ticks vary in size from the size of a comma up to about one-quarter inch in diameter. When embedded into the skin, they may resemble a small freckle. Tick season spans from spring through summer, but may extend year-round in areas without significant cold weather.

Black Widow

The Black Widow spider varies from dark brown to black in color. Its body is ¼ inch wide and overall size is 1-½ inches with legs extended. Only the female is poisonous and can be determined by the red or yellow hourglass marking the underside of the abdomen. The victim will experience the following if a Black Widow spider has bitten them:

- The spider's bite will feel like a sharp pinprick or may not even be noticed at all. In 15 minutes or less, the person will feel a dull, numbing pain in the bitten area. A faint red bite mark appears;
- If the bite is in the lower part of the body or legs, the victim will have muscle stiffness or cramps in their abdomen. If the bite is on the upper body or arms, the victim will have muscle stiffness or cramps affecting the shoulders, back or chest; and
- The victim may also experience headache, chills, fever, heavy sweating, dizziness, nausea, and vomiting and severe abdominal pain.

Brown Recluse

The Brown or Violin spider (also referred to as the Brown Recluse) is light tan to brown in color and has a violin-shaped figure on its back. It is approximately the size of a quarter with its legs extended. The victim will experience the following if a Brown Recluse has bitten them:

- The initial pain of a Brown Recluse bite may be slight enough to be overlooked;
- Several hours after the bite, a blister will appear along with redness and swelling;
- Within 2 to 8 hours, pain will occur. Initially it may be mild, but can become severe;
- The victim may also experience fever, weakness, vomiting, joint pain or a rash; and
- Within a week, an ulcer will form and in some cases gangrene may develop.

Ticks

Lyme Disease

Lyme disease is caused by an infection from a deer tick carrying a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibiotics has been successful in preventing more serious symptoms from developing. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and

the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bites. Almost one third of those with Lyme disease never get the rash. Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with pain that comes with other types of arthritis; however, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis. Lyme disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

Rocky Mountain Spotted Fever

Rocky Mountain Spotted Fever is an infection caused by rickettsia bacteria carried by the dog tick in the eastern United States and by the wood tick in the Rocky Mountain States. The lone star tick is also a rare carrier in the West. The signs and symptoms of RMSF may follow within 1-14 days of a tick bite, but in many cases, the person does not remember being bitten by a tick. Symptoms of RMSF usually begin suddenly. There is a high fever, often 103 °F (39 °C) to 105 °F (40 °C); chills; muscle aches and a severe headache that may center in the forehead area. Eyes may become red, muscles may be tender to the touch, and there may be generalized body swelling.

The rash may begin anytime between 1-10 days after the fever and headache start, but it most often appears on the third to fifth day. The rash looks like small red spots or blotches that begin on the wrists, ankles, palms and soles. It spreads up the arms and legs toward the trunk, but often spares the face. As the infection progresses, the original red spots may change in appearance to look more like bruises or bloody patches under the skin. Rarely, RMSF may cause either mild symptoms or no symptoms at all. Usually it causes a moderate to severe illness that can damage the liver, kidneys and lungs.

Striped Bark Scorpion

The Striped Bark Scorpion is yellowish to tan in color with two broad blackish strips on the abdomen. The males have a longer tail than the female. The key feature of all scorpions is their slender pedipalps

(pinchers) in front and the recurved tail. Striped Bark Scorpions can be up to 2 inches long. They are nocturnal and are extremely active roamers during April, May and early June. Once bitten, the victim may experience very mild to very harsh symptoms depending on the individual's sensitivity to the venom.

- Initial sting is painful and will cause immediate swelling and itching;
- People hypersensitive to venom may experience discoloration in the area of the bite, edema, itching, and numbness;
- Effects of the sting will subside within several hours to several days.

3.3.1.2 Bites and Stings Hazard Mitigation/Prevention

The SSC will instruct the field crew in the recognition and procedures for encountering poisonous insects at the Sites. Additionally, any individuals who have been bitten or stung by an insect will notify the SSC. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and as often as needed throughout the work day;
- Wear proper protective clothing (work boots, socks and pants);
- When walking in wooded areas, avoid contact with bushes, tall grass or brush as much as possible; and
- Field personnel who may have insect allergies will provide this information to the SSC prior to commencing work and shall have allergy medication on each Site.

Mild insect bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the stinger. The suction device in commercially available snakebite kits can also be used to remove the stinger. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought. Immediate medical care is required if a person is allergic to insect bites/stings. If an allergic person receives a spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given, if necessary, to supply oxygen to the victim.

First aid procedures for a Black Widow or Brown Recluse bite are as follows:

- Clean the bitten area with soap and water or rubbing alcohol. Do not apply a constricting band because the black widow venom's action is swift; there is little to be gained by trying to slow absorption with a constriction band;
- To relieve pain, place an ice pack over the bite;

- Keep the victim quiet and monitor breathing;
- Seek immediate medical attention; and
- If possible, catch the spider to confirm its identity, even if the body is crushed.

It is recommended that personnel in areas that could harbor deer ticks wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the SSC will be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe. The employee will be offered the option for medical treatment by a physician, which typically involves prophylactic antibiotics. If personnel feel sick or have signs similar to those above, they will notify the SSC immediately.

3.3.2 Wild Animals

3.3.2.1 Animal Hazard Identification

During site operations, wild animals such as stray dogs or cats, raccoons and mice may be encountered. Other potentially hazardous mammals that may be present at Fort Sheridan include: coyote, opossum, bobcat, skunk, gray fox, red fox, and bats. These animals may carry rabies and should be avoided. In addition, Hanta Virus is also a concern when coming into contact with rats, mice and bats. Hanta Virus is a disease spread primarily from infected rodent droppings and results from intimate contact with rodents, such as may occur in agricultural areas with dense human and rodent populations or during soil excavation. Hanta virus is not transferred from person to person. The overwhelming evidence is that the virus is spread from rodent to humans through contact with infected rodent secretions or airborne transmission by infected dust particles.

3.3.2.2 Animal Hazard Mitigation/Prevention

Workers shall use discretion and avoid all contact with wild animals. If these animals present a problem, the SSC or designee will be notified and will develop a plan to alleviate the problem. Measures to protect against the Hanta Virus should focus on cleaning all cuts and scratches with soap and water, followed by rinsing with hydrogen peroxide. Put liquid skin on the affected areas. The best preventive measure is to avoid all rodent nests. If rodent nests are discovered, field team members should be apprised of their locations and avoid working adjacent to the nests.

3.3.3 Snake Bites

3.3.3.1 Snake Bite Hazard Identification

Various reptiles, including poisonous snakes, may potentially be encountered at Fort Sheridan. Poisonous snakes common to Illinois are the copperhead, the cottonmouth, the timber rattlesnake, and the eastern massasauga.

3.3.3.2 Snake Bite Hazard Mitigation/Prevention

The following precautions should be used when working in areas potentially containing snakes:

- Wear appropriate protective equipment (e.g., work boots, snake chaps, etc.);
- Be alert and aware of your surroundings;
- Avoid walking in wooded areas, rock piles, and stacks of old boards, heavy brush or tall grass if possible;
- Never handle a "dead snake," they may not be completely dead and can bite due to reflex action; and
- If a snake is encountered, do not attempt to catch or kill it. This is a major safety violation and grounds for dismissal from the site.

Immediately following a snake bite:

- Try to safely and quickly identify the species of snake if practical. DO NOT TRY TO CATCH OR KILL THE SNAKE. Move victim to safety. Try to keep the victim calm and comfortable. The victim's condition is assisted with an observation that calm and competent assistance is being firmly applied;
- Remove any jewelry or tight fitting clothing. Immobilize the bitten area and keep it lower than the heart;
- Without cutting, apply strong suction using a commercial bite kit, preferably within seconds of the bite, directly on the main or deepest puncture/bite marks. Time is critical, as any venom present will become destructive very quickly;
- Apply antiseptic cleanser to the entire area and place a cold compress as close as possible to the wound without interfering with the suction process;
- Continue strong suction and alternate the location of compress to avoid injury from severe cold;
- Monitor for symptoms of shock and be prepared to administer appropriate treatment. At any sign of major stress, shock or unusual/unexplained discomfort, check for the need to apply other first aid techniques – elevate legs from lying down position, keep warm, etc.;

- Keep victim warm and immobilize as practical. Movement to proper treatment facility is more crucial than maintaining immobile status. Maintain above treatment functions throughout; and
- Transport safely at the earliest possible time to competent medical service. Ideally, all of the above steps can be administered concurrently with the transport phase.

3.3.4 Poisonous Plants

3.3.4.1 Poisonous Plant Hazard Identification

The potential for contact with poisonous plants exists when performing fieldwork in undeveloped and wooded areas. Poison ivy or oak may be present on the Sites. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration; however, the leaves have slightly deeper notches.

Contact with poison ivy or oak may lead to a skin rash in susceptible individuals. A rash results from a toxin found in the sap that is extruded from the leaves and contained in the stems and roots. The rash is characterized by reddened, itchy, blistering skin that needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

3.3.4.2 Poisonous Plant Hazard Mitigation/Prevention

Avoidance of plant/sap contact is the only effective means of preventing the poisoning. A person experiencing symptoms of poisoning should remove contaminated clothing; wash all exposed areas thoroughly with soap and water, taking care not to touch the face or other body parts. Apply calamine or other poison ivy/oak lotion if the rash is mild. Seek medical advice if a severe reaction occurs or if there is a known history of previous sensitivity. Employees will be trained in the identification of these species and will be advised to wear protective clothing such as gloves and long sleeve shirts when working conditions permit. Employees should also consider applying barrier lotions to the skin if they have the potential to come into contact with these species.

3.3.5 Bloodborne Pathogens (BBP)

3.3.5.1 Bloodborne Pathogen (BBP) Hazard Identification

Bloodborne pathogens (BBP) enter the human body and blood circulation system through punctures, cuts or abrasions of the skin or mucous membranes. They are not transmitted through ingestion

(swallowing), through the lungs (breathing) or by contact with whole, healthy skin. However, under the principle of universal precautions, all blood should be considered infectious and all skin and mucous membranes should be considered to have possible points of entry for pathogens. "Universal precautions," as defined by the Centers for Disease Control and Prevention (CDC), are a set of precautions designed to prevent transmission of Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV), and other BBP when providing first aid or health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other BBP.

There are a number of infections transmitted by insects and arthropods where the infection cycle includes the human blood system. Examples include malaria and Lyme disease, which are transmitted by mosquitoes and ticks, respectively. These diseases are serious and the possibility for infection should be considered. However, these diseases cannot be transmitted through personal contact with human blood, and are not covered by the OSHA BBP Standard. Potential BBP exposure includes:

- Contact with contaminated medical equipment, medical waste or sharps,
- Medical emergency response operations such as administering first aid or cardiopulmonary resuscitation (CPR), and
- Contact with human wastes such as domestic sewage.

Two primary BPP include HBV and HIV.

3.3.5.2 BBP Hazard Mitigation/Prevention

To reduce the risk of contracting a BBP, take the following precautions:

- Universal precautions;
- Avoid contact with blood and other bodily fluids;
- Use protective equipment when giving First Aid/CPR, such as disposable gloves and breathing barriers; and
- Thoroughly wash hands with soap and water immediately after giving aid.

A vaccine exists for Hepatitis B. Should employees desire the vaccine, their employer will arrange to have the employee receive the series of inoculations. While less efficient, the HBV vaccine is also effective when administered after exposure to blood containing the HBV virus.

The SSC should be notified of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job. Site personnel will be given BBP training. This hazard is also discussed below in **Section 10.1**.

4.0 FIELD STAFF

The Project Team, Stakeholders, Subcontractors, and e²M's Project Personnel and Project Organization Chart are provided in the WP.

The Field Project Personnel and Project Contacts are listed below in **Table 4-1**, along with their contact information. The e²M FPM/SSC (Kevin Sedlak) and a UXO Technician II are the only project personnel anticipated to be present on the MRSs during the performance of the field effort for this SI. If any MEC is found on the MRSs, the personnel listed under "Project Contacts" will be immediately notified.

Table 4-1: Contact Information

Name And Title	Contact Information
Field Personnel	
Kevin Sedlak, e²M FPM/SSC	Cell: (210) 639-9719 Office: (210) 348-6000
UXO Technician II (Steve Burhans, Malcolm Pirnie)	Cell: (443) 804-7448 Office: (410) 230-0680
Project Contacts	
Robert Zaruba, USACE CENWO-PM	Office: (402) 221-7659
Courtney Ingersoll, e²M TPM	Cell: (757) 999-3506 Office: (757) 643-7886
Dr. Kurt Thomsen, BRAC BEC	Cell: (262) 880-5272 Office: (847) 266-6323

4.1 Subcontractor – Malcolm Pirnie

Subcontractors are responsible for the safe conduct of their personnel while on Site and ensuring their compliance with the project SSHP. In addition, they are responsible for notifying the SSC of any special medical conditions, and are responsible for correcting any unsafe acts or conditions that are identified by the SSC or FPM. Specialized subcontractor personnel are described below (the UXO PM/UXO Technician II) may be responsible for all three of the following roles and meets the respective requirements for those roles in accordance with Department of Defense Explosives Safety Board Technical Paper 18:

UXO PM

The UXO PM reports directly to the e²M TPM and it is the responsibility of the UXO PM to:

- Ensure implementation of this program through coordination with the site manager,
- Conduct monthly safety audits or delegate this responsibility to the Senior UXO Supervisor when not able to conduct the inspection on site,
- Participate in major incident investigations,
- Ensure the SSHP has all the required approvals before any site work is conducted,
- Ensure that the UXO Site Safety Officer (UXOSO) and e²M SSC are informed of project scope changes that require modifications of the SSHP,
- Ensure overall project responsibility for UXO related health and safety, and
- Ensure adequate resources are provided to the field staff to carry out their responsibilities as outlined below.

UXO Supervisor/Field Team Leader

The UXO supervisor is responsible for the following:

- Acts as the Field Team Leader for the UXO investigation,
- Ensures site personnel comply with the SSHP,
- Directs the surface inspection and sweeps,
- Ensures overall direct supervisory responsibility for specific UXO procedures,
- Coordinates with the UXOSO on matters regarding UXO,
- Stops or modifies any work conditions or removes personnel from the site if the conditions are unsafe,
- Ensures all site personnel understand and comply with all UXO safety requirements,
- Monitors team leader and team member performance including safety and quality control,
- Responsible for the day-to-day UXO-related work at the site,
- Responsible for implementing and enforcing all work plans related to UXO operations,
- Conducts daily activities such as: supervising employees in site-specific UXO operations, overseeing the implementation of specified levels of personal protective equipment, identifying potential problem areas and making corrective action recommendations to the UXO PM, implementing all corrective actions, and maintaining a daily log of work activities including noting any extraordinary occurrences,
- Conducts incident investigations,

- Initiates corrective actions for observed safety violations, and
- Assists the UXOSO and e²M SSC with the daily safety meeting.

UXO Site Safety Officer (UXOSO)

The UXOSO is responsible for the following:

- Works as a member of the project team to ensure implementation of this SSHP,
- Ensures all health and safety activities identified in this SSHP are conducted and/or implemented,
- Conducts UXO recognition and avoidance training,
- Identifies operational changes that require modifications to health and safety procedures and the SSHP, and ensures the procedure modifications are implemented and documented through changes to the SSHP,
- Conducts daily informal inspections,
- Directs and coordinates health and safety monitoring activities,
- Ensures site personnel are trained in the proper use of PPE,
- Ensures field teams utilize proper PPE,
- Assists in conducting daily safety briefings,
- Conducts and documents inspection of equipment brought on site,
- Monitors compliance with this SSHP,
- Notifies the e²M SSC of all accidents/incidents by email or phone call the day of the accident/incident,
- Ensures all personnel are evacuated safely in the event of a UXO related evacuation,
- Coordinates with the e²M SSC, UXO PM, Senior UXO Supervisor, and USACE OE Safety Specialist in any incident investigation,
- Maintains Accident/Incident Report Forms and Investigation Reports,
- Determines upgrades or downgrades of PPE based on site conditions and/or real-time monitoring results,
- Ensures monitoring instruments are calibrated before use (if required),
- Maintains health and safety field log books,
- Prepares and submits weekly and monthly Health and Safety reports to the e²M SSC, and
- Monitors quality control for UXO related work.

5.0 TRAINING

The MRSs and MRAs have not been fully characterized for MEC. However, it is known from previous investigations that the onsite soils have elevated concentrations of metals (lead above background concentrations). All workers on Site during performance of the field work portion of this project will be required to have 40-Hour Occupational Safety and Health Administration hazardous waste operations and emergency response (OSHA HAZWOPER 29 CFR 1910.120) training. Site personnel will have fire extinguisher use training, and at least two members of the crew will be trained and current in first aid and CPR. In addition, all first aid responders will be trained in accordance with the requirements of 29 CFR 1910.1030 and specifically 29 CFR 1910.1030(g)(2) on the occupational exposure to BBP and other potentially infectious materials.

Prior to initiating Site activities, the e²M SSC will conduct a safety and health "Kick-off Tailgate Safety" meeting. At this time, pertinent e²M procedures and the SSHP will be discussed in detail with special attention being given to Site chemical and physical hazards, PPE, emergency procedures, etc. Upon completion of this briefing, all routine field personnel, including subcontractors, will be required to read and sign the acceptance sheet of this SSHP (Site-Specific Safety and Health Orientation Log). Applicable field forms/documents can be found in **Attachment A**.

Site visitors and non-routine subcontractors who do not attend this meeting will be required to undergo a specialized health and safety orientation, as documented on the Site-Specific Safety and Health Orientation Log. All employees and visitors who enter the Site must sign in on the Employee/Visitor Daily Sign-in Roster (See **Attachment A**).

The e²M SSC will maintain on-site a copy of the certifications certifying that all e²M and subcontracted personnel have satisfied the minimum training requirements. Supporting documentation and certificates will remain on file with the FPM. A copy of the SSHP will also be kept on site in a location known to all on-site personnel. Field projects will not be allowed to take place in the absence of adequate documentation.

Additional site-specific training covering Site hazards, procedures, and all contents of the approved SSHP will be conducted by the UXOSO and e²M SSC for all on-site employees, prior to the commencement of work, and for visitors prior to entering the MRSs.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The PPE specified in this plan represents the PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the e²M Certified Industrial Hygienist (CIH) and the e²M Corporate Health and Safety (H&S) Director will evaluate the proposed field activities, along with the chemicals and MEC, to determine the appropriate level of PPE. This will be conducted by performing a hazard assessment and by taking into consideration the following:

- Potential chemical and physical hazards present or suspected;
- Published exposure limits (OSHA and ACGIH);
- Work operations to be performed;
- Potential routes of exposure; and
- Characteristics, capabilities, and limitations of PPE, and any hazards that the PPE presents or magnifies.

In addition to the applicable site-specific requirements, the minimum PPE that will be used at all the MRSs includes:

- Leather or other protective work shoes or boots with high traction soles and ankle protection. Steel-toed shoes or other footwear that could cause interference with instruments used during geophysical detection activities will not be worn.
- Short sleeve shirts and long pants are considered the minimum clothing required for UXO support work and will be worn at all work sites.
- Hard hats will be worn in designated hard hat areas. (Hard hat areas will not be designated unless an overhead hazard exists.)
- Hearing Protection – Based upon the scope of work for this project, it is not anticipated that situations will arise where site personnel will be exposed to noise levels in excess of sound-pressures greater than 85 dBA steady-state as an 8-hour time weighted average (TWA) or 140 dBA impulse.
- Safety glasses will be used during field activities.

The signatures on the approval page of this SSHP constitute certification of the hazard assessment.

6.1 Adjustment of Protection Levels

It should be noted that this SSHP makes provisions for adjustment of protection levels to a more protective or less protective level based on site conditions. The type of equipment used and the

overall level of protection should be reevaluated periodically as the amount of information about the work activity increases and as workers are required to perform different tasks. The level of protection appropriate for the tasks and working conditions will be determined by the SSC, but at a minimum will be level D. Protection levels may be upgraded based on physical or other conditions (e.g., generation of dust) on-site with prior approval of the e²M Corporate H&S Director and notification to the CENWO-PM.

Considerations for the upgrade of protection levels include:

- Known or suspected presence of dermal hazards,
- Occurrence or likely occurrence of gas or vapor emission,
- Change in a work task that will increase contact or potential contact with hazardous materials, and
- Request of the individual performing the task.

7.0 MEDICAL SURVEILLANCE

Medical surveillance is not required for this project.

If it becomes necessary to institute medical surveillance, Site staff will have medical clearance for respirators that are to be worn, following protocols at least as stringent as those defined in the e²M Medical Surveillance Program. If necessary, medical certifications will also be submitted to the e²M FPM by the subcontractors prior to the mobilization of field crews. The SSC will maintain an on-site copy of the certificates certifying that all e²M and subcontracted personnel have satisfied the minimum medical requirements. Supporting documentation and certificates will remain on file with the FPM. Field projects will not be allowed to take place in the absence of adequate documentation.

8.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

8.1 Safe Work Practices and General Work Rules

The following are general Site safe work practices and rules in addition to the specific requirements addressed under **Section 3.0** Hazard Analysis of Field Work Activities.

- Unauthorized personnel are not allowed onsite.
- Work groups will always consist of at least two (2) team members.
- A high standard of personal hygiene will be observed. Smoking, eating, and drinking will not be permitted within the work areas.
- While not anticipated for the performance of this project, open flames (such as for welding) are not allowed onsite without a signed hot-work permit.
- Personnel under the influence of alcohol or controlled substances will not be allowed onsite. Persons taking medications must notify the site supervisor.
- Personnel will avoid skin contact with contaminated or potentially contaminated media. If such contact occurs, the affected areas must be washed immediately with soap and water.
- Personnel will discard and replace any damaged or soiled protective clothing.
- Personnel must notify the site supervisor of any defective emergency or protective equipment.
- A supply of potable water, electrolyte replacement solutions, shaded break area, and sufficient lighting will be maintained. Sanitary facilities will be accessible to personnel.
- All unsafe conditions will be corrected immediately. All unsafe conditions not previously anticipated and documented in the scope of this project will be reported to the site supervisor.
- All site personnel will familiarize themselves with these rules and the emergency procedures during pre-work safety meetings.
- Workers who are passengers or drivers of vehicles (both offsite and onsite) will wear their seat belts anytime the vehicle is in motion.
- Vehicles will not be fueled while vehicle is running.
- Protective gloves will be worn to protect hands from cuts and abrasions of sharp and rough objects being handled.
- Mechanical lifting aides will be used wherever possible to avoid dead-lifting awkward or heavy items.
- Work in pairs to free and handle difficult materials.
- Use shovels and hand tools rather than hands to carry materials.

- Before handling materials, be sure the object is not connected to other materials that could impede the removal of the single object.
- Plan each step to avoid tripping or falling on uneven footing.
- Where it is necessary to use force or move a heavy object a distance, use heavy equipment to minimize personal energy and exertion.
- If applicable, cut large objects into smaller, easier to handle pieces to reduce an object's individual weight or length.
- Apply generally accepted lifting and material handling safe work practices when transporting materials. Keep objects in close proximity to the body, keep straight back posture, and avoid twisting the upper body. Do not reach for overhead objects and know their weight before attempting to handle them.
- Mechanical devices such as wheelbarrows and construction equipment should be used to lift or move awkward or heavy materials.

8.2 Illumination

All work is to be performed during daylight hours, when natural visibility is optimized. The FPM will consider task travel distance and time requirements when establishing field work schedules to permit the safe travel to and from work locations during daylight hours. If circumstances arise in which field work is to be extended before or after daylight, or when sunlight conditions are obstructed, temporary illumination will be maintained for transport vehicles and general site areas.

8.3 Personal Hygiene

Potable drinking water and health and safety drinks will be supplied in tightly closed containers and will be clearly marked for their intended use. Restrooms and a washing area with potable water will be available at a central point within a reasonable distance from the work Sites. Due to the uncertainties of site conditions, high personal hygiene standards will be observed.

8.4 Fuel or Hazardous Material Spills

Upon a release of a fuel or hazardous material, personnel should take precautions for personal safety, and if possible contain the spill with onsite equipment, to the extent that the responder's training capability allows. If necessary, the SSC will evacuate all non-response personnel and visitors to the refuge area. Fuels or hazardous materials must be properly containerized, labeled, and handled. Clean-up materials will be disposed of at an approved disposal facility. The e²M TPM will notify the CENWO-PM, and the United States Environmental Protection Agency (USEPA) or appropriate agency will be notified within 24 hours after occurrence, if the spill is greater than the reportable quantity (25 gallons).

9.0 SITE CONTROL MEASURES

Fort Sheridan is surrounded by a perimeter fence that is patrolled regularly. Access to the installation is gained by passing through an unguarded entrance. Anyone can access the installation. Once on site, individual movement is not restricted; however, some portions of the MRSs and MRAs are fenced.

Two-way radios and cell phones will be used for on-site and off-site communications for Site personnel to monitor activities. Cell phones will not be used while operating vehicles.

10.0 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

First Aid Response Procedure - Summon the e²M SSC in person or via radio. The SSC will then assess the situation, after first taking necessary precautions for personnel safety. If the injury is more serious than first aid that can be administered at the site, the affected person will be sent or taken to the nearest hospital identified in **Figure 1**. If the accident is serious enough to endanger life or limb, the e²M SSC is to contact emergency personnel at **911** and immediately begin life-saving measures. A vehicle will be available at all times in the event that immediate transportation to a hospital or emergency care center is necessary for injured person(s). First aid will be administered to the extent possible while waiting for emergency responders. **The map to the nearest hospital is provided as Figure 1.**

During the emergency, e²M personnel will take reasonable measures to ensure that no further injury occurs, including the following:

- stopping all operations,
- isolating the area where hazard exists, and
- keeping a fire extinguisher close at hand for preventive purposes.

Injured persons will be treated at the place they suffered the injury whenever possible. Where it becomes necessary to move a victim, care must be taken not to cause further harm. Victims will be instructed to remain calm until more advanced treatment arrives at their location. While waiting for advanced medical treatment the worker will be monitored and treated for shock symptoms. A first-aid kit located in a company vehicle will be available during all field operations at all times to treat minor cuts, scrapes, and other minor injuries.

In the event of an accident or incident the e²M TPM and CENWO-PM will be notified immediately, and within 2 working days an accident report will be sent to the CENWO-PM. It will be the responsibility of the e²M SSC to investigate any accident and complete the e²M Supervisor's First Report of Injury/Illness, Accident form (see **Attachment A**), as appropriate. The e²M Corporate H&S Director will assist in these duties as appropriate. All accidents, no matter how big or small and including near misses are to be reported to the e²M Corporate H&S Director within 24 hours. The reporting procedure will be as follows:

- Following an injury accident involving any employee or subcontractor at any e²M/USACE jobsite, the e²M TPM and CENWO-PM will be notified immediately. The e²M SSC or FPM will then complete an e²M Supervisors First Report of Injury/Illness, Accident form (**Attachment A**). Following notification of the CENWO-PM, USACE - Omaha District personnel will contact knowledgeable e²M safety personnel and complete ENG Form 3394 (**Attachment A**), which will be submitted to the CENWO Safety Officer within 7 days of the incident.

See the first page of this document for a map to the nearest hospital (Figure 1) and the second page of this document for the Emergency Reference List.

10.1 BBP Exposure Control Plan

The e²M Corporate Exposure Control Plan provides detailed procedures for controlling exposure to BBP. Procedures are summarized herein.

Exposure Determination: Any field person trained in first-aid response has the potential to be exposed to BBP. Tasks where exposures could occur include response to a bleeding injury and CPR.

Exposure Control - PPE: While rendering first aid where exposure to blood may occur, e²M employees will don protective gloves (N-Dex undergloves or Nitrile overgloves) and use a Rescue Breather Device (with one-way valve) if administering CPR. The gloves and Rescue Breather Device should be readily available in all first-aid kits.

Hepatitis B Vaccination: First-aid providers whose primary job assignment is not first aid administration do not need to receive a pre-exposure HBV vaccine. All first-aid providers assisting in any situation involving an exposure incident must be offered the full HBV immunization series no later than 24 hours after the incident.

Exposure Incident Evaluation: All first-aid incidents involving exposures must be reported to the e²M SSC before the end of the work shift in which the incident occurs. A First-Aid Incident Report must be completed describing the circumstances of the accident and response. Following a report of an exposure incident, e²M will make immediately available to the employee a confidential medical evaluation follow-up.

11.0 ACCIDENT PREVENTION

As part of the implementation of this SSHP, the e²M FPM/SSC will conduct a "Kick-off Tailgate Safety" meeting at the beginning of the field work and daily "tailgate" safety meetings. Topics of discussion will include work tasks, potential hazards, designated PPE, emergency procedures, evacuation routes, recognition of signs and symptoms of medical conditions, importance of proper decontamination, personal hygiene, etc. See **Attachment A** for a copy of the Tailgate Safety Meeting form, and the Site-Specific Safety and Health Orientation Log.

12.0 LOGS, REPORTS, AND RECORDKEEPING

The following logs, reports, and records will be maintained onsite and submitted to the CENWO-PM with the project completion documentation:

- *Training Logs:* Prior to mobilization of field crews, proof of safety and health training and medical certifications (if applicable) must be submitted to the e²M FPM by the subcontractor. The SSC will maintain on-site copies of the certifications certifying that all e²M and subcontractor personnel have satisfied the minimum training and medical requirements listed above. Supporting documentation and certificates will remain on file with the e²M FPM. Field work will not be allowed to take place in the absence of adequate documentation.
- *Daily Safety Inspection Logs (can be part of the daily QC Reports):* The health and safety field files maintained by the e²M SSC, or his/her designee, will be the primary form of record keeping and documentation of Site health and safety activities. These documents will be completed in sufficient detail to document the work performed; any unusual or significant circumstances under which the work was performed; any unanticipated/unplanned action taken to mitigate or to otherwise cope with unexpected field conditions; and pertinent comments about site-specific conditions that could have a bearing on the work performed. Documentation is required for all phases of work.
- *Equipment Maintenance Logs (can be part of the daily QC reports):* Equipment will be maintained in good working order and maintenance will be documented.
- *Employee/Visitor Register:* All employees and visitors who enter the Site must sign in on the Employee/Visitor Daily Sign-in Roster. Site visitors and non-routine subcontractors will be required to undergo a specialized safety and health orientation, as documented on the Site-Specific Safety and Health Orientation Log (See **Attachment A**).

In addition, e²M will maintain a Safety and Health Binder that will contain applicable documents from the following list:

- Certification of medical and training requirements,
- Signed acceptance sheet of this SSHP (Site-Specific Safety and Health Orientation Log, see **Attachment A**),
- Health and safety notations made in the Field Note Book that is held by the e²M SSC,
- Safety inspection records including violations and remedial action plans, and
- OSHA Form #300 and corresponding OSHA 301s (e²M Supervisors First Report of Injury/Illness, Accident Form acts in this capacity, see **Attachment A**).

e^2M RECORD OF CHANGE
SITE-SPECIFIC SAFETY AND HEALTH PLAN

GENERAL SITE INFORMATION

Site Name: Date:

Project Number: Site H&S Coordinator:

Project Manager: Site Manager:

DESCRIPTION OF AND JUSTIFICATION FOR CHANGE:

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SSC Signature: ..... Date: .....

Authorization: ..... Title: ..... Date: .....

EMPLOYEE/VISITOR DAILY SIGN-IN ROSTER*

PROJECT NO. SITE NAME:

DATE: FIELD PROJECT MANAGER:

DATE	NAME	COMPANY	TIME ONSITE	OFFSITE

*This roster is require for emergency response planning. All personnel arriving to and from the site must sign this roster. This Log does not replace the S&H Orientation.

SITE-SPECIFIC SAFETY AND HEALTH ORIENTATION LOG*

The undersigned acknowledge, understand, and agree with the following:

I have been briefed as to the nature of work in this project, its potential hazards, required PPE, and the route to the nearest hospital.

The Site-specific Safety and Health Plan (SSHP) has been explained to me, and is available to be referenced on site at all times.

I agree to abide by the SSHP and all procedures outlined in the SSHP. I understand that noncompliance with the SSHP may lead to my removal from the site.

Date	Name	Signature	40 Hr OSHA Cert. No/Expiration (If applicable)	Company

Date	Name	Signature	40 Hr OSHA Cert. No/Expiration (If applicable)	Company

TAILGATE SAFETY MEETING

PROJECT: _____ PROJECT NO. _____
DATE: _____ TIME: _____
CLIENT: _____

SPECIFIC SITE LOCATION: _____

TYPE OF WORK: _____
CHEMICAL USED: _____

SAFETY TOPICS PRESENTED

PPE _____

Chemical Hazards _____

Physical Hazards _____

Health and Safety Plan _____

Emergency Procedures _____
Hospital _____ Hospital Phone #, or 911
Hospital Address _____

Special Equipment _____

Other _____

ATTENDEES

Name (Print) Signature

_____

_____

_____

_____

_____

_____

_____

Meeting Conducted by: _____

TAILGATE SAFETY MEETING
PAGE 2 of 2

ATTENDEES

Name (Print)	Signature

Supervisors First Report of Injury/Illness, Accident

Project Site	Date of incident	Time of incident	Hrs. at work before incident

Location of incident	Date incident became restricted duty or lost-time

Job title of injured	Contractor Name.	Body part injured	Nature of injury

Type of accident		Severity class of incident		
Lost Time	Rest.'d Duty	Severe 1	Mod. 2	Minor 3

SEQUENCE OF EVENTS

Describe the physical situation plus pertinent events before, during, and after the incident.

APPARENT CAUSES

List causes that appear to have directly contributed to the incident – unsafe acts and conditions.

ROOT CAUSES	List underlying factors that appear to have directly contributed to the incident – System and Personal Factors

IMMEDIATE ACTIONS TAKEN	List actions that will successfully prevent recurrence, as understood at this early stage of the investigation.

DIAGRAM	Draw an illustration detailing events, surroundings, or other pertinent factors relating to the incident.

Distribution: a Chandy Abaygar - Human Resources Manager

v Rob Klawitter, Director, Corporate Health and Safety

(For Safety Staff only)	REPORT NO.	EROC CODE	UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT *(For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)*	REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)
		G0		

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC ☐ FATAL ☐ OTHER			☐	

2. PERSONAL DATA

a. Name *(Last, First, MI)*	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER *(Specify)*

3. GENERAL INFORMATION

a. DATE OF ACCIDENT *(month/day/year)*	b. TIME OF ACCIDENT *(Military time)* hrs	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR's NAME (1) PRIME: (2) SUBCONTRACTOR:

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE ACTIVITY
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER *(SPECIFY)*	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER *(SPECIFY)*	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER *(Specify)*

4. CONSTRUCTION ACTIVITIES ONLY *(Fill in line and corresponding code number in box from list - see instructions)*

a. CONSTRUCTION ACTIVITY	(CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE)
	#		#

INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see instructions)*

a. SEVERITY OF ILLNESS / INJURY	(CODE)	B. ESTIMATED DAYS LOST	C. ESTIMATED DAYS HOSPITALIZED	D. ESTIMATED DAYS RESTRICTED DUTY
	#			

e. BODY PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE)
PRIMARY	#	TYPE	#
SECONDARY	#	SOURCE	#
f. NATURE OF ILLNESS / INJURY	#		

6. PUBLIC FATALITY *(Fill in line and correspondence code number in box - see instructions)*

a. ACTIVITY AT TIME OF ACCIDENT	(CODE)	b. PERSONAL FLOATATION DEVICE USED?
	#	☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER *(Specify)*	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER *(Specify)*	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	B. OWNERSHIP	C. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT *(Fill in line and correspondence code number in box from list - see instructions)*

a. TYPE OF VESSEL/FLOATING PLANT	(CODE)	b. TYPE OF COLLISION/MISHAP	(CODE)
	#		#

ACCIDENT DESCRIPTION *(Use additional paper, if necessary)*

See attached page.

11. **CAUSAL FACTOR(S)** *(Read Instruction Before Completing)*

a. (Explain YES answers in item 13)	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. (CONTINUED)	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. **TRAINING**

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAINING.
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	(Month) (Day) (Year)

13. **FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES** *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a. DIRECT CAUSE

See attached page.

b. INDIRECT CAUSE(S)

See attached page.

14. **ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).**

DESCRIBE FULLY:

See attached page.

15. **DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.**

a. BEGINNING (Month/Day/Year)	b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT CORPS _____ CONTRACTOR _____	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*	f. OFFICE SYMBOL

16. **MANAGEMENT REVIEW** *(1st)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. **MANAGEMENT REVIEW** *(2nd - Chief Operations, Construction, Engineering, etc.)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. **SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW**

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE

19. **COMMAND APPROVAL**

COMMENTS

COMMANDER SIGNATURE	DATE

*U.S. GOVERNMENT PRINTING OFFICE: 1993-0-791-757

10. ACCIDENT DESCRIPTION (Continuation)

15a. DIRECT CAUSE *(Continuation)*

13b.	INDIRECT CAUSES *(Continuation)*

14.	ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S) (Continuation)