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December 27, 2011

U.S. Army Engineering and Support Center Huntsville via FedEx
ATTN: CEHNC-OE-DC (Paula Henderson)
4820 University Square
Huntsville, Alabama 35816-1822
(256) 895-1269

**SUBJECT:** **SUBMITTAL OF DRAFT FINAL SITE INSPECTION REPORT FOR FUDS MMRP – SI PHASE**
***SITE:*** **LEESBURG AIR SERVICE CENTER, SUMTER COUNTY, FLORIDA**
**FUDS PROPERTY NO. I04FL014301**
**USACE CONTRACT NO. W912PL-10-D-0121, TASK ORDER 0003**

Dear Ms. Henderson:

Please find enclosed two paper-bound copies and two electronic copies of the Draft Final Site Inspection Report for the Leesburg Air Service Center in Sumter County, Florida. This document is prepared by Parsons Infrastructure and Technology Group, Inc. (Parsons) as subcontractor to Eco & Associates, Inc. (Eco) under U.S. Army Corps of Engineers (USACE) Contract W912PL-10-D-0121 Task Order 0003.

Should you have any questions or comments, please feel free to contact us at (714) 289-0995.

Sincerely,
ECO & ASSOCIATES, INC.

Mohammad Estiri, PhD
Project Director

cc: Mr. William A. Spence (CESAJ) – 5 hard copies, 5 CD copies
Ms. Deborah Walker (CEHNC-EMM) – 1 hard copy, 1 CD copy
Mr. Terry L. Walker (CEHNC-EMS) – 1 CD copy
Ms. Rebecca Terry (CEHNC-EMM) – EKO
Mr. Dwayne Ford (CEHNC-EMM) – EKO
Ms. Laura Kelley (Parsons) – 1 hard copy, 1 CD copy

Enclosures: 2 hard copies, 2 CD copies

**CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW**

Parsons Infrastructure and Technology Group (Parsons) has completed the Draft Final Site Inspection report for the Leesburg ASC, Sumter County, Florida. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.

Kathleen A. Rowland Jim L. Davis

Kari Bulware

December 27, 2011

Study/Design Team Leader and Team Members

Jim L. Davis Carol Moore

December 27, 2011

Independent Technical Review Team Leader

Significant concerns and the explanation of the resolution are as follows:

None

As noted above, all concerns resulting from independent technical review of the project have been considered.

Dan Laura Kelley

December 27, 2011

Parsons Program Manager(s)

# SITE INSPECTION REPORT

**FORMERLY USED DEFENSE SITE**
**MILITARY MUNITIONS RESPONSE PROGRAM**
**SITE INSPECTION PHASE**

**•DRAFT FINAL•**

**December 27, 2011**

**Leesburg Air Service Center, Sumter County, Florida**

**FUDS No.: I04FL014301**

**Contract No. W912PL-10-D-0121**
**Task Order 0003**

**Prepared for:**
**United States Army Corp of Engineers, Jacksonville District**
**701 San Marco Boulevard**
**Jacksonville, Florida 32207**

***and***

**U.S. Army Engineer and Support Center Huntsville**
**4820 University Square**
**Huntsville, Alabama 35816-1822**

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AAF | Army Air Force |
| APP | Accident Prevention Plan |
| ARC | Annual Report to Congress |
| ASC | Air Service Center |
| ASR | Archive Search Report |
| BD/DR | Building Demolition/ Debris Removal |
| CEMVR | U.S. Army Corps of Engineers, Rock Island District |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CESAJ | U.S. Army Corps of Engineers, Jacksonville District |
| CFR | Code of Federal Regulations |
| CON/HTRW | Containerized Hazardous, Toxic, and Radioactive Waste |
| CSEM | Conceptual Site Exposure Model |
| CSM | Conceptual Site Model |
| DERP | Defense Environmental Restoration Program |
| DoD | Department of Defense |
| DQO | Data Quality Objective |
| DRI | Development of Regional Impact |
| ELAP | Environmental Laboratory Accreditation Program |
| EPP | Environmental Protection Plan |
| ER | Engineer Regulation |
| ESV | Ecological Screening Value |
| FAC | Florida Administrative Code |
| FDE | Findings and Determination of Eligibility |
| FDEP | Florida Department of Environmental Protection |
| FGS | Florida Geological Survey |
| FMSF | Florida Master Site File |
| FNAI | Florida Natural Areas Inventory |
| FUDS | Formerly Used Defense Site |
| FUDSMIS | FUDS Management Information System |
| GP | General Purpose |
| GPS | Global Positioning System |
| HE | High Explosive |
| HQ | Hazard Quotient |
| HRR | Historical Records Review |
| HRS | Hazard Ranking Score |
| HTRW | Hazardous, Toxic, and Radioactive Waste |
| HTW | Hazardous Toxic Waste |
| IGD | Interim Guidance Document |
| INPR | Inventory Project Report |
| MC | Munitions Constituents |
| MD | Munitions Debris |

# ACRONYMS AND ABBREVIATIONS (CONTINUED)

| | |
|---|---|
| MDL | Method Detection Limit |
| MEC | Munitions and Explosives of Concern |
| MMR | Military Munitions Response |
| MMRP | Military Munitions Response Program |
| MRS | Munitions Response Site |
| MRSPP | Munitions Response Site Prioritization Protocol |
| msl | mean sea level |
| NAD | North American Datum |
| NCP | National Contingency Plan |
| NDAI | No Department of Defense Action Indicated |
| NELAP | National Environmental Laboratory Accreditation Program |
| NOAA | National Oceanic and Atmospheric Administration |
| NRCS | Natural Resources Conservation Service |
| Parsons | Parsons Infrastructure and Technology Group |
| ppm | Parts Per Million |
| PQL | Practical Quantitation Limit |
| PRG | Preliminary Remediation Goal |
| PSAP | Programmatic Sampling and Analysis Plan |
| PWP | Programmatic Work Plan |
| PWS | Performance Work Statement |
| QA | Quality Assurance |
| QC | Quality Control |
| QR | Qualitative Reconnaissance |
| RAC | Risk Assessment Code |
| RI/FS | Remedial Investigation and Feasibility Study |
| ROE | Right-of-Entry |
| RSL | Regional Screening Level |
| SAP | Sampling & Analysis Plan |
| SCTLs | Soil Cleanup Target Limits |
| SDG | Sample Delivery Group |
| SFWMD | South Florida Water Management District |
| SI | Site Inspection |
| SJRWMD | St. Johns River Water Management District |
| SLERA | Screening Level Ecological Risk Assessment |
| SLRA | Screening Level Risk Assessment |
| SOP | Standard Operating Procedure |
| SS-WP | Site-Specific Work Plan |
| SVT | Site Visit Team |
| T&E | Threatened and Endangered |
| TNT | Trinitrotoluene |
| TPP | Technical Project Planning |
| USACE | U.S. Army Corps of Engineers |

# ACRONYMS AND ABBREVIATIONS (CONTINUED)

| | |
|---|---|
| USAESCH | USACE, Engineering and Support Center, Huntsville |
| USC | United States Code |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UTM | Universal Transverse Mercator |
| UXO | Unexploded Ordnance |

# GLOSSARY OF TERMS

| | |
|---|---|
| **Anomaly** | Any item that deviates from the expected subsurface ferrous and non-ferrous material at a site (i.e., pipes, power lines, etc.). |
| **Inhabited Structure** | Permanent or temporary structure, other than military munitions-related structures, routinely occupied by one or more persons for any portion of the day. |
| **Magnetometer** | An instrument for measuring the strength of a magnetic field; used to detect buried ferrous objects. |
| **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. |
| **Munitions and Explosives of Concern (MEC)** | Military munitions that may pose unique explosives safety risks, including UXO, discarded military munitions, or munitions constituents present in high enough concentrations to pose an explosive or other health hazard. |
| **Munitions Constituents (MC)** | Any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. |
| **Munitions Debris** | Remnants of munitions (e.g., penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal. |

# GLOSSARY OF TERMS (CONTINUED)

| | |
|---|---|
| **Munitions Response** | Response actions, including investigation, removal actions, and remedial actions, to address the explosive safety, human health, or environmental risks presented by unexploded ordnance, discarded military munitions, or munitions constituents, or to support a determination that no removal or remedial action is required. |
| **Munitions Response Site (MRS)** | A discrete location within an MRA that is known to require a munitions response. |
| **Projectile** | Object projected by an applied force and continuing in motion by its own inertia. This includes bullets, bombs, shells, grenades, guided missiles, and rockets. |
| **Unexploded Ordnance (UXO)** | Military munitions that have been primed, fuzed, armed, or otherwise prepared for action; that have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material; and that remain unexploded whether by malfunction, design, or any other cause. |

# EXECUTIVE SUMMARY

ES.1 The objective of this site inspection (SI) was to determine whether the former Leesburg Air Service Center (ASC), located in Sumter County, Florida, warrants further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) beyond the SI stage. The Leesburg ASC was identified as a Formerly Used Defense Site (FUDS) and assigned FUDS project # I04FL014301. The SI was performed to evaluate the evidence for the presence of munitions and explosives of concern (MEC) and munitions constituents (MC) at the site. To accomplish this objective, qualitative reconnaissance (QR) and MC sampling were performed. The work was performed under Contract No. W912PL-10-D-0121, Task Order No. 0003 from the United States Army Engineering and Support Center, Huntsville (USAESCH).

ES.2 The Leesburg ASC site was used as a satellite training facility of the Army Air Forces School of Applied Tactics based in Orlando, Florida. According to the 2010 FUDS Management Information Systems (FUDSMIS) there are two munitions Response Sites (MRSs) at the site: The MRS01-300 Yard Known Distance Rifle Range, and the MRS02- Hand Grenade Court. The suspected munitions used at the MRS01-300 Yard Known Distance Rifle Range are small arms (.22 Caliber, .30 Caliber, .38 Caliber, and .45 Caliber) and do not pose a residual explosive hazard if any are left at the site intact. Based on the qualitative MEC risk evaluation (subchapter 6.1), it is unlikely that human receptors might come into contact with explosively hazardous MEC at the MRS01-300 Yard Known Distance Rifle Range at the Leesburg ASC. Therefore, there is no potential for an explosive safety risk at this MRS.

ES.3 The suspected munitions used at the MRS02- Hand Grenade Court are live grenades with high explosive (HE) and practice grenades. The live grenades do pose a residual explosive hazard if left at the site intact. Based on the qualitative MEC risk evaluation (subchapter 6.1), there is a possibility that human receptors might come into contact with explosively hazardous MEC at the MRS02- Hand Grenade Court at Leesburg ASC. Therefore, there is a potential for an explosive safety risk at this MRS.

ES.4 The Technical Project Planning (TPP) Team agreed that the SI data collection efforts would focus on screening for MC presence in surface soil. Sixteen surface soil samples were collected from site locations selected with maximum bias for the presence of MC contamination within the MRSs at the Leesburg ASC. The twelve biased surface soil sample identifications for MRS01- 300 Yard Known Distance Rifle Range are listed as LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-12. The four biased surface soil samples for MRS02- Hand Grenade Court are listed as LASC-MRS02-SS-02-13 through LASC-MRS02-SS-02-16. All of the biased samples are located within the MRSs at the site. Four discretionary surface water/sediment sample couples were proposed at the site and would have been collected based on site conditions. Due to no appropriate surface water sources being located within this FUDS, the

discretionary samples were not collected. Three surface soil samples were collected from areas outside the MRSs but inside the FUDS boundary to serve as ambient metals data used only for the Munitions Response Site Prioritization Protocol (MRSPP) scoring. The ambient sample identifications are as follows: LASC-AMB-SS-02-17, LASC-AMB-SS-02-18, and LASC-AMB-SS-02-19. Quality Control (QC) samples were also collected from the site.

ES.5 The biased soil samples LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-4 located at the firing points in MRS01- 300 Yard Known Distance Rifle Range were analyzed for explosives. The remaining biased soil samples (LASC-MRS01-SS-02-05 through LASC-MRS01-SS-02-12) within the MRS01- 300 Yard Known Distance Rifle Range were analyzed for select metals antimony, copper, and lead. The biased surface soil samples collected from the MRS02- Hand Grenade Court were analyzed for explosives, iron, and zinc. Additionally, the ambient samples collected outside of the MRSs were analyzed for antimony, copper, iron, lead, and zinc.

ES.6 The Site Visit Team (SVT) mobilized to the Leesburg ASC on August 23, 2011. To assess the presence or absence of munitions debris (MD) and MEC, the SVT conducted approximately 1.7 miles of QR throughout the FUDS. No MEC or MD was observed within the MRS01- 300 Yard Known Distance Rifle Range or the MRS02- Hand Grenade Court. However, within the MRS01- 300 Yard Known Distance Rifle Range, a berm approximately 10 feet high and 400 feet in length was observed by the SVT. No MEC or MD was observed on, or adjacent to, the berm.

ES.7 The Leesburg ASC FUDS is located approximately 5 miles southeast of Wildwood, Florida in the Sumter Upland and Lake Harris Cross Valley Physiographic Provinces. The FUDS is located near the center of the Floridian peninsula and area is subtropical, characterized by warm humid summers and mild moderate dry winters. The area surrounding the MRSs is essentially flat with elevations ranging from about 65 to 70 feet above msl. Surface water from precipitation events will tend to pond in depressional areas and remain at the surface for long periods. Groundwater is the primary source of drinking water for the city of Wildwood. No wells are reportedly located within the MRSs at the Leesburg ASC. The MRSs contain predominantly palustrine wetlands with various subsystems, classes, and subclasses. The wetlands include potential habitats for some of the Threatened and Endangered (T&E) species on-site. Due to wetlands and potential T&E habitats being present on-site, the FUDS and MRSs are ecologically important places.

ES.8 Based on the current and future land use at the FUDS, the potential receptors for the MRS01- 300 Yard Known Distance Rifle Range include future residents, visitors/recreational users, commercial/industrial workers, and ecological receptors. The potential receptors for the MRS02- Hand Grenade Court include visitors/recreational users, commercial/industrial workers, and ecological receptors.

ES.9 APPL analyzed the environmental samples from MRS01- 300 Yard Known Distance Rifle Range for explosives (firing point samples), selected metals antimony, copper, and lead. The environmental samples from the MRS02- Hand Grenade Court were analyzed for explosives and selected metals iron and zinc. Parsons did not collect “background” samples, but rather “ambient” samples to provide separation

from the statistical-based and baseline risk assessment connotation. The ambient sample data was used for comparison and calculations for the MRSPP scoring. The analytes that are potential MC and were detected in the biased samples were retained for consideration in the screening level risk assessment (SLRA). Any detection of explosives is considered potential MC contamination and would be evaluated in the SLRA.

ES.10 The analytical results were compared to the following criteria to determine the need to perform a SLRA for each particular analyte:

- Was the analyte a potential constituent of munitions known or suspected of being used on-site?
- Was the analyte detected in the sample?

ES.11 The SLRA revealed the following results for the samples collected at the Leesburg ASC FUDS:

**MRS01- 300 Yard Known Distance Rifle Range:** MC metals antimony, copper, and lead were detected in the soil samples collected and the maximum detected concentrations of antimony, copper, and lead did not exceed their human health screening values for surface soil at the MRS01- 300 Yard Known Distance Rifle Range. Therefore, based on the analytical results presented in this report, an unacceptable human health risk due to former munitions-related activities is not expected from exposure to MC in the surface soil at the MRS01- 300 Yard Known Distance Rifle Range.

**MRS02 – Hand Grenade Court:** No explosives were detected at this MRS; however, MC metals iron and zinc were detected in the biased surface soil samples analyzed. Iron is not a CERCLA hazardous substance; therefore, iron is not generally evaluated as a MC under the FUDS program. The maximum detected concentrations of iron and zinc did not exceed their human health screening values for surface soil at the MRS02- Hand Grenade Court. Therefore, based on the analytical results presented in this report, an unacceptable human health risk due to former munitions-related activities is not expected from exposure to MC in the surface soil at the MRS02- Hand Grenade Court.

ES.12 The Screening Level Ecological Risk Assessment (SLERA) revealed the following results for the samples collected at the Leesburg ASC FUDS:

**MRS01- 300 Yard Known Distance Rifle Range:** MC metals antimony, copper, and lead were detected in the soil samples collected and the maximum detected concentrations of antimony, copper, and lead did not exceed their ecological screening values for surface soil at the MRS01- 300 Yard Known Distance Rifle Range. All of the resulting Hazards Quotients (HQ) were less than 1. Therefore, based on the analytical results presented in this report, an unacceptable ecological risk due to former munitions-related activities is not expected from exposure to MC in the surface soil at the MRS01-300 Yard Known Distance Rifle Range.

**MRS02 – Hand Grenade Court**: No explosives were detected at this MRS; however, MC metals iron and zinc were detected in the biased surface soil samples analyzed. Iron is not a CERCLA hazardous substance; therefore, iron is not generally evaluated as a MC under the FUDS program. The maximum detected concentration of zinc was below its ecological screening value for surface soil at the MRS02– Hand Grenade Court with a

HQ less than 1. Therefore, based on the analytical results presented in this report, an ecological risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS. At the request of FDEP, iron was evaluated for this site. Iron slightly exceeded its ESV at this MRS. The maximum detected concentration for iron at this MRS is 270 mg/kg, slightly higher than the Region 4 value, resulting in a HQ of 1.3.

ES.13 A qualitative risk assessment for MEC was conducted based on SI field observations and historical data regarding previous site visits and removal actions (Chapter 6). Based on the observations made during this investigation, the potential munitions utilized at the MRS01- 300 Yard Known Distance Rifle Range in the past, it is unlikely that residual MEC may exist at this MRS. Munitions used at this MRS do not present a residual explosive hazard, if any remain on-site intact. However some of the potential munitions (live grenades [HE] and practice grenades) used in the past at the MRS02- Hand Grenade Court could pose a residual explosive hazard if left at the site intact. The MEC exposure pathway for the MRS01- 300 Yard Known Distance Rifle Range is incomplete, and the MRS02 – Hand Grenade Court MEC exposure pathway is potentially complete.

ES.14 As shown in Table ES.1, the MRS01- 300 Yard Known Distance Rifle Range and the MRS02 – Hand Grenade Court at the Leesburg ASC FUDS in Sumter County, Florida are recommended for No DoD Action Indicated (NDAI) and Remedial Investigation and Feasibility Study (RI/FS), respectively. Munitions removal actions are not warranted at this time. The NDAI recommendation for the MRS01- 300 Yard Known Distance Rifle Range is based upon lack of MEC or MD observations and no reported injuries since site closure. In addition, the maximum detected concentrations of antimony, copper, and lead did not exceed their human health or ESVs for soil and the small arms munitions potentially used at the site do not present a residual explosive hazard. The RI/FS recommendation for the MRS02- Hand Grenade Court is based upon the potential munitions used at the site that could pose an explosive hazard if left at the site intact.

**Table ES.1**
**Recommendations**
**Leesburg ASC, Sumter County, Florida**

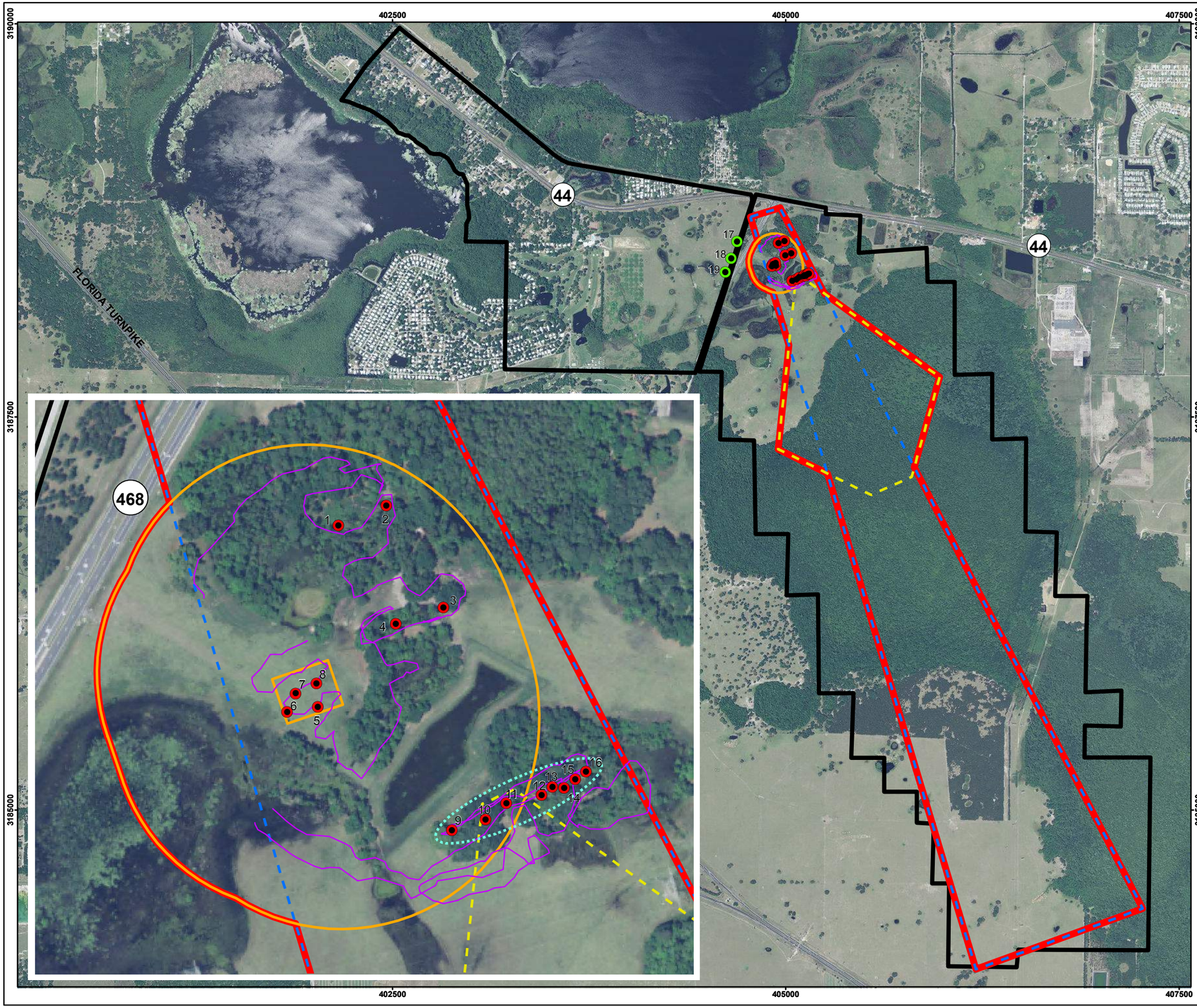
| MRS | Acreage | Munitions and Explosive of Concern and/or Munitions Debris Assessment (1) | Munitions Constituents Assessment (2) | Recommendation |
|---|---|---|---|---|
| MRS01– 300 Yard Known Distance Rifle Range | 1112 | ***No*** USACE documents issued since site closing confirm the use of the site as a small arms range. The munitions suspected to have been used at this MRS do not present a residual explosive hazard if any remain at the site intact | ***No*** An unacceptable risk to human receptors and ecological receptors via exposure to MC in surface soil is not expected at the MRS01– 300 Yard Known Distance Rifle Range | ***NDAI*** |
| MRS02– Hand Grenade Court | 24.92 | ***Yes*** USACE documents issued since site closing confirm the use of the site as a potential grenade range. Some of the munitions (live grenades) suspected to have been used at this MRS may present a residual explosive hazard if any remain at the site intact | ***No*** An unacceptable risk to human receptors and ecological receptors via exposure to MC in surface soil is not expected at the MRS02-Hand Grenade Court | ***RI/FS*** |

Notes:
(1) "Yes" in this column indicates confirmed MEC or MD presence indicative of potential MEC presence, resulting in a RI/FS recommendation for the MRS. "No" in this column indicates no confirmed MEC or MD indicative of potential MEC presence.
(2) "Yes" in this column indicates the presence of MC at levels indicating a potential elevated risk to human health or ecological receptors, resulting in a recommendation for further MC sampling during a RI/FS. "No" in this column of the table indicates the absence of MC at levels indicating a potential risk to human health or ecological receptors, resulting in a recommendation for no further MC sampling for the MRS.

Figure ES.1

# General Site Overview
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- Observation Location
- Soil Sample Location
- Ambient Soil Sample Location
- Qualitative Reconnaissance Track
- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Berm Location
- Hand Grenade Court MRS
- FUDS Boundary


Site Location in Florida

N

Image: 2010 Orthophotos
Projection: UTM Zone 17 NAD83, Map Units in Meters

800 400 0 800 Meters

| | |
|---|---|
| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

| | | | |
|---|---|---|---|
| DESIGNED BY: BT | General Site Overview | | |
| DRAWN BY: BT | | | |
| CHECKED BY: TB | SCALE: As Shown | PROJECT NUMBER: 748037.10014 | |
| SUBMITTED BY: TD | DATE: December 2011 | PAGE NUMBER: ES-6 | |
| | FILE: X:\GIS\Site_inspections_ne\Maps\leesburg_FL\FigES_1.mxd | | |

# CHAPTER 1
# INTRODUCTION

## 1.1 BACKGROUND

1.1.1 Eco & Associates, Inc., and their subcontractor Parsons Corporation (Parsons) received Contract No. W912PL-10-D-0121, Task Order 0003, from the United States Army Engineering and Support Center, Huntsville (USAESCH) to perform a Site Inspection (SI) at the ***Leesburg Air Service Center (ASC) located in Sumter County, Florida***. The Leesburg ASC Formerly Used Defense Site (FUDS; project # ***I04FL014301***)

1.1.2 The Leesburg ASC is located approximately 5 miles southeast of Wildwood, Florida. The site was used as a satellite training facility of the Army Air Forces School of Applied Tactics based in Orlando, Florida. Construction of the Leesburg ASC was completed in May 1943. Over the course of developing Leesburg ASC, the federal government acquired 2,232 acres of land by lease and condemnation between 1942 and 1945 for an Army Air Force (AAF) tent camp, rifle range, and ordnance area. The site consisted predominantly of vacant land; however, known site improvements included grading, fencing, and 1,125 tents. The AAF determined that the property was excess to their needs on March 8, 1945, and declared it surplus. Between May 14, 1945, and April 10, 1946, the War Department terminated the leases and relinquished the property to the then current owners.

1.1.3 The Leesburg ASC FUDS is comprised of two Munitions Response Sites (MRSs), the MRS01- 300 Yard Known Distance Rifle Range and the MRS02- Hand Grenade Court. Figure 1.1 depicts the FUDS boundary for the overall site. The coordinates for the estimated center points of the MRSs are listed in Table 1.1. The estimated coordinates are in meters (Universal Transverse Mercator [UTM] Zone 17 North American Datum [NAD] 83).

**Table 1.1**
**Leesburg ASC MRS Coordinates**

| MRS | X-Coordinate (meters) | Y-Coordinate (meters) |
|---|---|---|
| MRS01- 300 Yard Known Distance Rifle Range | 403442 | 3189199 |
| MRS02- Hand Grenade Court | 403442 | 3189199 |

## 1.2 PROJECT OBJECTIVES

1.2.1 The Department of Defense (DoD) has established the Military Munitions Response Program (MMRP) to address DoD sites suspected of containing munitions and explosives of concern (MEC) or munitions constituents (MC). Under the MMRP, the USACE is conducting environmental response activities at FUDS for the Army, DoD's Executive Agent for the FUDS program.

1.2.2 Pursuant to USACE's Engineer Regulation (ER) 200-3-1 U.S. Army Corps of Engineers [USACE], 2004a) and the Management Guidance for the Defense Environmental Restoration Program (DERP) (Office of the Deputy Under Secretary of Defense, Installations and Environment, September 2001), USACE is conducting FUDS response activities in accordance with the DERP statute (10 United States Code [USC] 2701 et seq.), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC §9601 et seq), Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Part 300). As such, USACE is conducting remedial SIs, as set forth in the NCP, to evaluate hazardous substance releases or threatened releases from eligible FUDS.

1.2.3 While not all MEC/MC constitute CERCLA hazardous substances, pollutants or contaminants, the DERP statute provides DoD the authority to respond to releases of MEC/MC, and DoD policy states that such responses shall be conducted in accordance with CERCLA and the NCP.

1.2.4 This report summarizes the work performed during the SI and presents an accounting of any MEC and MC contamination identified on the site. The SI was limited exclusively to MEC and MC contamination issues requiring collection of a sufficient and appropriate amount of information, but does not consider other unrelated hazardous and toxic waste (HTW) concerns the site may pose. Per ER 200-3-1, guidance for conducting a SI, Section 4-4.1.2:

> *The SI is not intended as a full-scale study of the nature and extent of contamination or explosive hazards. The objectives of the remedial SI are to: (i) Eliminate from further consideration those releases that pose no significant threat to public health or the environment; (ii) Determine the potential need for removal action; (iii) Collect or develop additional data, appropriate for HRS [Hazard Ranking Score] scoring by [US]EPA [United States Environmental Protection Agency]; and (iv) Collect data, as appropriate, to characterize the release for effective and rapid initiation of the RI/FS [Remedial Investigation/Feasibility Study].*

1.2.5 An additional objective of the SI is to collect the additional data necessary to complete the Munitions Response Site Prioritization Protocol (MRSPP).

1.2.6 The SI was performed because of findings identified in the 1994 Inventory Project Report (INPR), the 2004 INPR Supplement, 2010 Historical Records Review

(HRR), and the 2010 FUDS Management Information System (FUDSMIS) conducted and written by the USACE- Jacksonville District (CESAJ), the USACE- Rock Island District (CEMVR), and the US Army Defense Ammunition Center and School. All work adhered to the DERP for FUDS and relevant U.S. Army regulations and guidance for MEC programs. As specified in the task order, this report is prepared to summarize the SI sampling events and presents an accounting of the MEC/MC contamination identified on-site.

## 1.3 PROJECT SCOPE

1.3.1 The Technical Project Planning (TPP) Team concurred on January 6, 2011 that the MRS01- 300 Yard Known Distance Rifle Range is to proceed to a ***No Department of Defense Action Indicated (NDAI) site*** and the MRS02- Hand Grenade Court is expected to be ***a RI/FS site***. Conventional ordnance items associated with Leesburg ASC include small arms (.22, .30, .38, and .45 Caliber) at the MRS01- 300 Yard Known Distance Rifle Range and potential grenade use (live hand fragmentation and hand practice) MRS02- Hand Grenade Court (USACE, 2010). It is possible that MEC remain on-site due to the potential High Explosive (HE) constituents within the hand fragmentation grenades at the MRS02- Hand Grenade Court; therefore, exposure pathways are most likely complete.

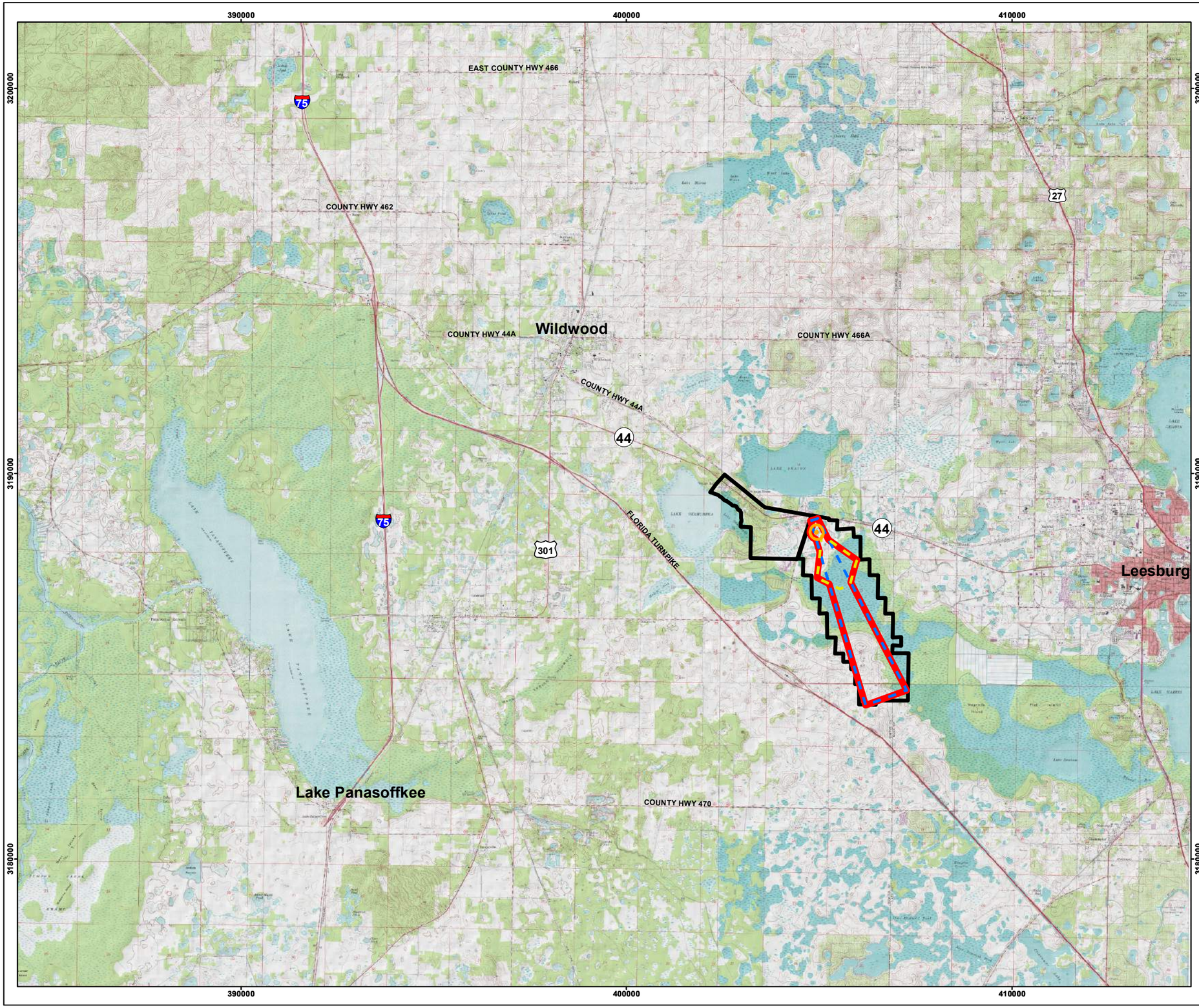
1.3.2 Twelve biased surface soil samples were proposed for collection within the MRS01- 300 Yard Known Distance Rifle Range. Two surface soil samples were collected at each of the three firing points and a minimum of six samples were collected at the berm. Four biased surface soil samples were proposed for collection within the MRS02- Hand Grenade Court. Three ambient soil samples were collected outside the MRSs for use in the MRSPP scoring. Four discretionary surface water/sediment sample couples were proposed for the site and were to be collected based on-site conditions. The surface water/sediment sample couple locations are located downgradient of the former firing points/impact berm and grenade court. In addition, two ambient surface water/sediment couples were to be collected outside and upgradient of the MRSs for use in the MRSPP. The surface water in the area is representative of the local groundwater and the proposed surface water sampling was to address any potential groundwater contamination issues. However, due to site conditions at the time of the site visit, surface water/sediment samples were not collected at the site because there was not a reliable source observed at the site by the site visit team (SVT).

1.3.3 The primary project planning documents used to perform the SI include the Site-Specific Work Plan (SS-WP) Addendum for Leesburg ASC (Parsons, 2011b), the USAESCH Programmatic Work Plan (PWP) (Parsons, 2005), the Programmatic Sampling and Analysis Plan (PSAP) (USACE, 2005), and the PSAP Addendum (Parsons, 2006). The Performance Work Statement (PWS) for this project is in Appendix A.

Figure 1.1

# Site Location Map
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Hand Grenade Court MRS
- FUDS Boundary


Site Location in Florida

N

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 17 NAD83, Map Units in Meters

2 1 0 2 Kilometers

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| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

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| DESIGNED BY: BT | **Site Location Map** | |
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# CHAPTER 2
# PROPERTY DESCRIPTION AND HISTORY

## 2.1 SITE DESCRIPTION

2.1.1 The Leesburg ASC FUDS is located in Sumter County, Florida, approximately 5 miles southeast of Wildwood, Florida. Figure 2.1 shows the site location.

2.1.2 The Leesburg ASC FUDS is 2,232-acres in aerial extent and is predominantly vacant, undeveloped land. A small development and golf course are located in the northwestern portion of the FUDS. Two MRSs are located within the FUDS property. The MRS01- 300 Yard Known Distance Rifle Range consists of 1,112-acres of land and is located in the southeast half of the FUDS. The MRS02- Hand Grenade Court is 24.92 acres and is located adjacent to the firing points of the rifle range.

## 2.2 SITE LOCATION AND SETTING

### 2.2.1 Topography and Vegetation

2.2.1.1 The topography at the FUDS is generally level with a low, swampy area in the southeastern portion of the FUDS property. Elevations range from 80 feet above mean sea level (msl) in the northwest portion of the FUDS to 60 feet above msl in the central and southeastern portion of the FUDS property. One small hill, located near the southern FUDS boundary rises to an elevation of 108 feet above msl (USGS, 1980).

2.2.1.2 The majority of the FUDS is undeveloped. The northwest portion, west of the MRSs, does have some residential and commercial development. Open areas are typically grassy where they are used for cattle grazing. Large wooded areas exist in the southern portions of the FUDS.

### 2.2.2 Geology and Soils

2.2.2.1 The Leesburg ASC is located in the Sumter Upland and Lake Harris Cross Valley Physiographic Provinces. These provinces contain uplands, ridges, and valleys. The topography in the area is characterized by karst features, such as sinkholes, springs, and caves, and the level Wicomico marine terrace. The Wicomico marine terrace is widespread along the central spine of the Floridian peninsula and is characterized by elevations ranging from 70 – 100 feet above msl.

2.2.2.2 The surficial sediments in this portion of Sumter County are Holocene-aged quartz sands with varying amounts of silt and clay, carbonate sands and muds, and organics. The thickness of these surficial sands ranges from 40 to 70 feet near the Leesburg ASC. The majority of the areal extents of the Leesburg ASC MRSs are underlain by Holocene sediments (Florida Geological Survey [FGS], 2001).

2.2.2.3 Underlying the Holocene sediments may be a thin layer of the Cypresshead Formation and a relatively thin (less than 30 feet thick) zone of undifferentiated Hawthorn Group sediments. The Pliocene aged Cypresshead Formation consists of reddish brown, unconsolidated, fine to very coarse, clean to clayey sands and is exposed at elevations above 100 feet above msl (FGS, 2001). The Miocene-aged Hawthorn Group sediments are composed of siliciclastics and relatively finer-grained sediments such as fine sands, clayey sands, sandy clays, and clay.

2.2.2.4 Underlying the Hawthorn group sediments is the Eocene-aged Ocala Limestone. Rocks of the Ocala Limestone are typically white-cream to tan-gray soft to hard, granular, porous marine limestone, and occasional dolostones. The Eocene-aged Avon Park Formation underlies the Ocala Limestone. Lithologically, the Avon Park Formation consists of layers of cream to light brown or tan, poorly indurate to well indurated, variably fossiliferous, limestone. The limestones are interbedded with tan to brown, fossiliferous dolostones (FGS, 2001).

2.2.2.5 The soils near the MRS sampling locations include the Delray fine sand, EauGallie fine sand, Smyrna fine sand, and the Okeelanta muck. The fine sands are typically deep; to deep, poorly, or very poorly drained, with rapid permeability in the upper horizons. Typically, the fine sands are found in broad flats, flood plains, and depressions. In general, the water table is at depths of less than 18 inches for 1 to 4 months in most years and between 12 and 40 inches for 3 to 6 months. In rainy seasons, the water table rises above the surface briefly. The Okeelanta series consists of very deep, very poorly drained, rapidly permeable soils in large fresh water marshes and small depressional areas. The upper 40 inches are predominantly organic material underlain with sand. In undrained areas, the water table is at depths of less than 10 inches below the surface or the soil is covered by water 6 to 12 months during most years (Web Soil Survey, 2010).

### 2.2.3 Climate

2.2.3.1 The FUDS is located near the center of the Floridian peninsula. The area is subtropical, characterized by warm humid summers and mild moderate dry winters. In the summer, temperatures tend to average near 80 degrees Fahrenheit with milder winters when temperatures are in the 60s. In July, the hottest month of the year, the average maximum temperature is 92.0 degrees Fahrenheit. Winters, although subject to invasions of cold air, are relatively mild. The coldest month is January with an average minimum temperature of 46.8 degrees and an average temperature of 59.0 degrees Fahrenheit, respectively (IDCIDE, 2011).

2.2.3.2 The average rainfall is 49.2 inches a year with the largest amounts of rain falling from June through September; however, precipitation is evenly distributed throughout the year. The wettest month is August with an average rainfall of 7.24 inches. Occasionally, tropical storms and hurricanes affect the area, but that is rare because generally hurricanes in this latitude tend to pass well offshore or lose much of their intensity while crossing the state before reaching this area (IDCIDE, 2011).

### 2.2.4 Hydrology

The area surrounding the MRSs is essentially flat with elevations ranging from about 65 to 70 feet above msl. Surface water from precipitation events will tend to pond in depressional areas and remain at the surface for long periods. Drainage near the MRSs is to the southeast towards the large swampy area located in the southeastern portion of the FUDS. Eventually surface water may discharge into Lake Denham.

### 2.2.5 Hydrogeology

2.2.5.1 Groundwater in Sumter County occurs under both unconfined and confined conditions. The surficial aquifer occurs within the Holocene-aged unconsolidated sands and possibly the underlying Cypresshead Formation. The base of the aquifer consists of the relatively finer-grained sediments of the undifferentiated Hawthorn Group. The thickness of the surficial aquifer is variable depending on the thickness of the sands, but in the study area it is approximately 50 feet thick (base at approximately 25 feet msl) based on the interpretation of nearby well logs (Florida Department of Environmental Protection [FDEP], 2008a). Recharge to the surficial aquifer is almost entirely from rainfall. The surficial aquifer could be a source for very small domestic water supplies.

2.2.5.2 A thin intermediate aquifer may underlie the surficial aquifer in the study area. The intermediate aquifer would consist of the more permeable layers within the undifferentiated Hawthorn Group sediments. In the study area, the Floridan Aquifer most likely directly underlies the surficial aquifer, in which case it would be in an unconfined condition. The framework of the Floridan aquifer is composed of the carbonate rocks of the Ocala Limestone and the underlying Avon Park Formation. The surface of the Floridan Aquifer in the study area is at an elevation of approximately 0 feet msl. Near the FUDS, the thickness of the Ocala Limestone ranges from 50-100 feet thick. The surface of the Avon Park Formation is at approximately -100 feet msl (FDEP, 2008a).

2.2.5.3 Groundwater is the primary source of drinking water for the city of Wildwood. According to the 2009 Annual Drinking Water Quality Report, the city of Wildwood derives groundwater from 7 wells completed in the Floridan Aquifer. The water is treated before distribution via chlorination, aeration, and additives such as polyphosphates (for iron) (City of Wildwood, 2011).

### 2.2.6 Significant Structures

There are no private residences but businesses are located within the FUDS boundary (Figure 2.2). There are more than 26 inhabited structures within a 2-mile radius of the MRSs at the Leesburg ASC FUDS.

### 2.2.7 Demographics

2.2.7.1 The demographics information for Sumter County, Florida was obtained from the United States Census Bureau State and County QuickFacts website (US Census Bureau, 2010a) and from the American Fact Finder Fast Access to Information link on the United States Census Bureau website (US Census Bureau, 2010b).

2.2.7.2 In 2010, the population of Sumter County was approximately 93,420. There were 31,659 occupied households with an average household size of 1.99. Population density for Sumter County was 170.8 persons per square mile. See Figure 2.2 for a breakdown of population within a 4-mile buffer of the site. The segment of the population over the age of 18 was 86.3 percent, while 22.0 percent was over the age of 65. The median age was 50.4 years. Approximately 83.9 percent of the population was Caucasian, 12.4 percent Black or African American, 0.6 percent Asian, 0.6 percent American Indian and Alaska Native, and 8.0 percent of the population were Hispanic or Latino of any race. The estimated occupational breakdown in Sumter County was as follows:

- Management, professional, and related occupations – 22.9 percent
- Service occupations – 23.9 percent
- Sales and office occupations – 22.8 percent
- Farming, fishing, and forestry occupations – 1.3 percent
- Construction, extraction, and maintenance occupations – 15.9 percent
- Production, transportation, and material moving occupations – 13.1 percent

2.2.7.3 As noted in Table 2.1, approximately 29,347 individuals live within a 4-mile buffer of MRS01- 300 Yard Known Distance Rifle Range, approximately 16,426 individuals live within a 4-mile buffer of MRS02- Grenade Court. The estimate was derived from a combination of map examination, 2010 census population information, and information gathered during the SI.

**Table 2.1**
**Population within 4-Mile Buffer of MRSs**
**Leesburg ASC, Sumter County, Florida**

| MRS | On-Site | 0 to 1/4 Mile | 1/4 to 1/2 Mile | 1/2 to 1 Mile | 1 to 2 Miles | 2 to 3 Miles | 3 to 4 Miles | Total |
|---|---|---|---|---|---|---|---|---|
| MRS01-300 Yard Known Distance Rifle Range | 0 | 43 | 155 | 330 | 3,553 | 2,687 | 22,579 | 29,347 |
| MRS02-Hand Grenade Court | 0 | 22 | 133 | 300 | 3,232 | 1,342 | 11,397 | 16,426 |

*Source: U.S. Census 2010 data. The population within the site, MRS, or within any buffer area is determined using a conservative approach to calculate the population of an area by including the total number of people for any census block that falls within or overlaps the site boundary, MRS boundaries, or buffer line.*

### 2.2.8 Current and Future Land Use

Currently, Sumter County and various private individuals and corporations own portions of the property. Approximately one quarter of the property is utilized for residential purposes, orange groves, a public park, and a boat ramp. The remainder of the FUDS property is timberland or unimproved. There is no evidence of former military structures except for a building formerly used as a barracks that is now the Heartland Christian Church. County Road 468 divides the portion of the FUDS occupied by the MRSs from the portion of the FUDS used as a tent camp. Recent improvements were made to County Road 468 near the MRSs and included the installation of a drainage basin and widening of the road. Installations of the drainage line and retention basin have disturbed some portions of the MRSs. A large residential development, named Southern Oaks, is planned for the southern portion of the FUDS and the MRS01- 300 Yard Known Distance Rifle Range.

### 2.2.9 Site Ownership and History

2.2.9.1 Construction of the Leesburg ASC was completed in May 1943. The site was used as a satellite training facility of the Army Air Forces School of Applied Tactics based in Orlando, FL. Over the course of developing Leesburg ASC, the federal government acquired 2,232 acres of land by lease and condemnation between 1942 and 1945 for an AAF tent camp, rifle range, and ordnance area. The site consisted predominantly of vacant land; however, known site improvements included grading, fencing, and 1,125 tents. The AAF determined that the property was excess to their needs on March 8, 1945, and declared it surplus. Between May 14, 1945, and April 10, 1946, the War Department terminated the leases and relinquished the property to the then current owners.

2.2.9.2 The former Leesburg ASC consisted of two main sections – Orange Home Tent Camp (northwest portion of the FUDS) and the adjacent MRS01- 300 Yard Known Distance Rifle Range and MRS02- Hand Grenade Court (southeastern portion of the FUDS). The Orange Home Tent Camp was located in the northwestern portion of the FUDS and was comprised of 587 acres, of which 215 acres were used as an ordnance site. The exact location of the ordnance site is unknown and there is no current physical evidence of the site (USACE, 2010). Conventional ordnance items were suspected of being stored somewhere within the 215 acre area. The MRS01- 300 Yard Known Distance Rifle Range, located to the southeast of the Tent Camp, was approximately 1,112 acres of land (as reported in FUDS Management Information System [FUDSMIS]). Conventional ordnance firing activities occurred at the rifle range and included small arms (rifle and pistol). The location of the rifle range was confirmed through historical documentation and included 15 targets with 100-, 200-, and 300-yard firing points. Reference of a pistol range was found; however, no specific location was discovered in the historical documentation. Pistol training presumably shared the rifle target area. The location of the grenade court and the type of grenade use (practice or live) is unconfirmed; however, aerial photo review suggests a location adjacent and just southwest of the 200 yard rifle range firing point. Conventional ordnance items associated with Leesburg ASC include small arms (.22, .30, .38, and .45 Caliber) and potential grenade use (hand fragmentation [HE] and hand practice) (USACE, 2010).

### 2.2.10 Cultural and Archeological Resources

2.2.10.1 According to the national register databases, the Leesburg ASC FUDS property is not in a National Heritage Area, nor does it contain a National Historic Landmark (National Park Service, 2011b-c). According to the National Register of Historic Districts, and the National Register of Historic Places, there are no recorded cultural/archeological sites located within the site (National Park Service, 2011d). The FUDS does not contain any sites identified in the Florida Historical Marker Program (Florida Historical Marker Program, 2011).

2.2.10.2 According to the Florida Master Site File (FMSF), there are 15 previously recorded archeological sites within the FUDS boundary; five archeological sites overlap the MRS01- 300 Yard Known Distance Rifle Range and MRS02- Hand Grenade Court (FMSF, 2011a and 2011b). The FMSF also indicated the search area including the FUDS and MRSs might contain unrecorded archeological sites, historical structures or other resources even if previously surveyed for cultural resources (FMSF, 2011a and 2011b).

2.2.10.3 There is the potential for undocumented archeological and/or cultural resources to be present within the Leesburg ASC property. During the SI QR and sample collection, care was taken to avoid any potentially sensitive areas. If an archeological remnant is discovered or suspected during an SI effort, soil sampling will cease in that area. It is Parsons policy to note in the field log the location of any archeologically significant items found by the SVT; however, these items will not be flagged. Parsons will also record the Global Positioning System (GPS) coordinates of the item and will notify the site owners. The GPS coordinates will not be included in the SI Report since this is sensitive information for a public document. Photographs of any archeological or cultural items found may be included in the SI Report. Archeological and cultural resources were not impacted by the SI field effort.

## 2.3 SITE OPERATIONS AND WASTE CHARACTERISTICS

### 2.3.1 MRS-Specific Descriptions/Operations

The 2010 FUDSMIS identified two MRSs at the Leesburg FUDS: the 112-acre MRS01- 300 Yard Known Distance Rifle Range and the 24.92-acre MRS02- Grenade Court. The FUDSMIS lists general small arms as the potential munitions associated with the MRS01- 300 Yard Known Distance Rifle Range, and live and practice hand grenades for the MRS02- Grenade Court.

### 2.3.2 MRS01- 300 Yard Known Distance Rifle Range

The MRS01- 300 Yard Known Distance Rifle Range consisted of a rifle range and was utilized for weapons familiarization and qualifications. Known Distance ranges may be designated 200-yard, 300-yard, or 500-yard. This rifle range was designated a 300-yard Known Distance Rifle Range with firing lines positioned at 100 yards, 200 yards, and 300 yards respectively. The range was constructed to accommodate 50 men and 10 targets, was approximately 400 yards wide, and was comprised of the firing lines, ammunition issue point, administrative area, and an earthen berm constructed directly

behind the targets to capture overshoots or misses. Only small arms were used on the rifle range (USACE, 2010).

### 2.3.3 MRS02- Hand Grenade Court

The MRS02- Hand Grenade Court was reportedly at the Leesburg ASC located immediately west of the berm associated with the MRS01- 300 Yard Known Distance Rifle Range. The distance to the nearest highway, State Road No. 2, approximately 835 feet, would have allowed use of HE that requires only 600 feet for safety clearance (USACE, 2010).

### 2.3.4 Regulatory Compliance

The USACE is conducting the SI at the Leesburg ASC as part of the FUDS response activities pursuant to and in accordance with the guidance, regulations, and legislation listed in Chapter 1.

## 2.4 PREVIOUS INVESTIGATIONS

### 2.4.1 1994 Inventory Project Report

An INPR was completed in 1994 and the site was recommended for an ordnance and explosive category project; however, the only evidence found supporting the potential existence of MEC were historical records. A site survey conducted in June 1994 yielded no indications of the presence of MEC; however, the site survey was conducted in the area of Orange Home (south shore of Lake Deaton) and not in the area of the former rifle and grenade ranges. The INPR assigned the site a Risk Assessment Code (RAC) of 5. Review of the INPR in 1995 by the USACE Huntsville Division concluded that there was no evidence of an ordnance site or a rifle range and the site was recommended for No Further Action concerning MEC (USACE, 1994; USACE, 2010).

### 2.4.2 2004 Inventory Project Report Supplement

The May 10, 2004, revisions to ER 200-3-1, Environmental Quality, FUDS Program Policy, included a policy change requiring that MC be addressed as part of MMRP projects. Numerous sites, formerly identified as NDAI, were reopened as potential MEC projects. Leesburg ASC was reopened as a potential MEC project, relating to the former ordnance storage area and rifle range, with a focus on any potential MC concerns. An INPR Supplement was issued in 2004 and identified one Military Munitions Response (MMR) area for future investigation: Rifle Range with a RAC score of 5 and a land acreage listing of zero. The INPR Supplement assumed that the ordnance site was used as an ordnance storage area (USACE, 2004).

### 2.4.3 2010 Historical Records Review

An ASR was not completed for the Leesburg ASC; however, a preliminary assessment was requested in September 2008. A HRR was completed and issued as a draft document in August 2010. The HRR considered the potential for MMRP; Hazardous and Toxic Radioactive Waste (HTRW); Containerized Hazardous and Toxic Radioactive Waste (CON/HTRW); and Building Demolition/ Debris Removal (BD/DR) concerns associations with DoD use of the Leesburg ASC. The HRR investigation team did not find any additional environmental investigations or reports concerning the FUDS.

The HRR states that no ordnance or explosives incidents have been reported since closure of Leesburg ASC. A bomb and shell disposal team from the Savannah District of the USACE inspected the rifle range and ordnance dump area on August 17, 1946. No dedudding was required and a clearance certificate was issued; however, the certificate was not found during the records review. The HRR found no evidence of chemical warfare materials storage, usage, or disposal at the FUDS. The HRR identified one MRS for the FUDS that includes both the rifle range, pistol range, and suspected grenade range (USACE, 2010).

### 2.4.4 2010 Formerly Used Defense Site Management Information Systems

The 2010 FUDSMIS was completed for Leesburg ASC and identifies two MRSs: MRS01- 300 Yard Known Distance Rifle Range and the MRS02- Hand Grenade Court. No MRS boundaries were provided in the FUDSMIS database; therefore, the MRS boundaries determined during research for the 2010 HRR were used within this SI.

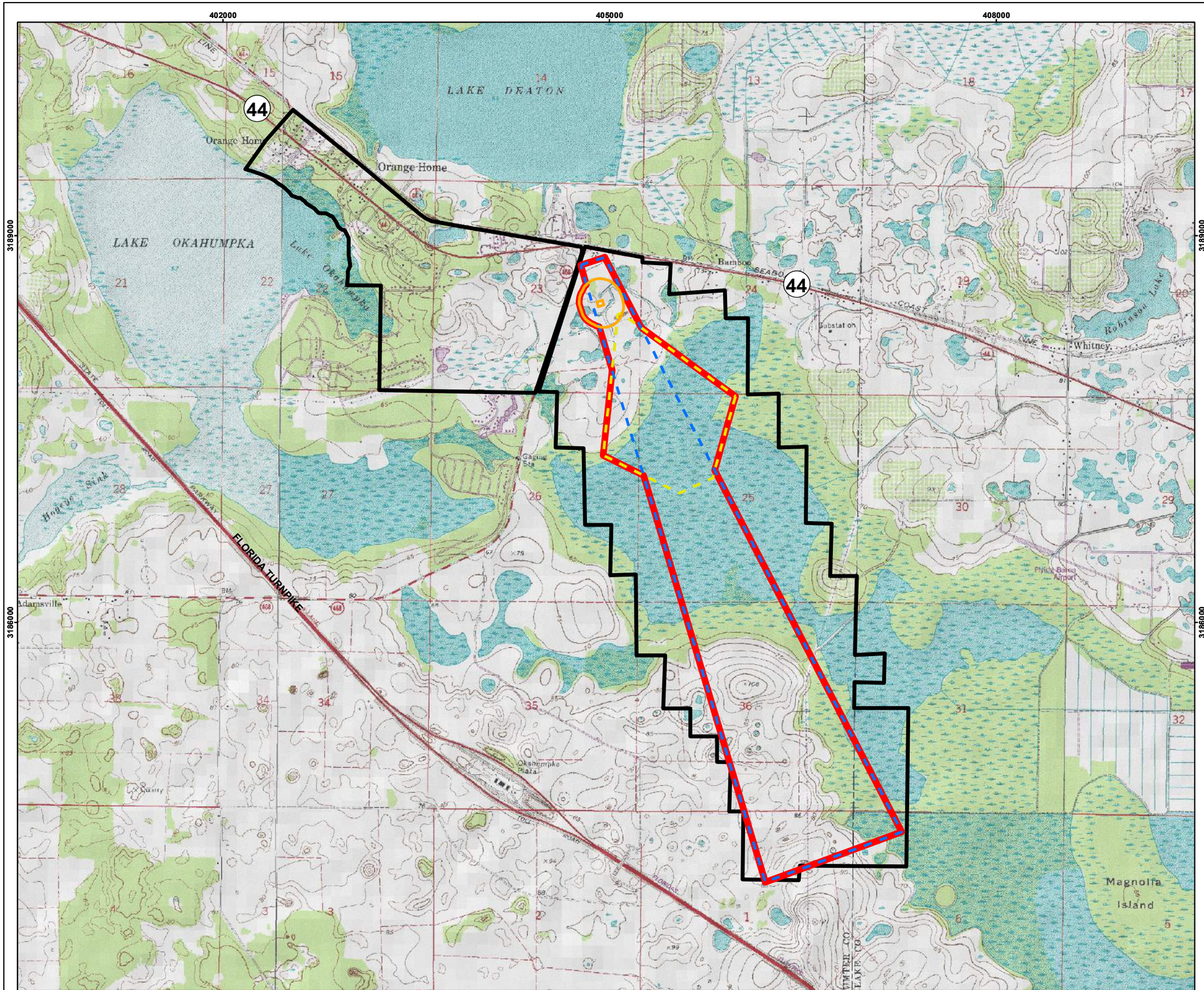
### 2.4.5 Technical Project Planning Memorandum

The Technical Approach, as established during the January 6, 2011, TPP Meeting, focused on placement of MC sampling locations in and around areas that represent the highest likelihood for the presence of contamination (target and firing areas). The SVT conducted Qualitative Reconnaissance (QR) throughout the site to evaluate the presence of MEC/munitions debris (MD). Actual QR was adjusted to local conditions on the date of the site visit. The QR and MC sampling at the Leesburg ASC FUDS are associated with the probable target locations within the MRS01- 300 Yard Known Distance Rifle Range, and the MRS02- Grenade Court. Details of the site-specific MC and QR strategy for the Leesburg ASC site are described in subsequent chapters of this report. No MEC has been reported or discovered and no known public injury incidents have been reported since site closure.

Figure 2.1

# Site Setting
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Hand Grenade Court MRS
- FUDS Boundary


Site Location in Florida

N

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 17 NAD83, Map Units in Meters

1 0.5 0 1 Kilometers

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| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

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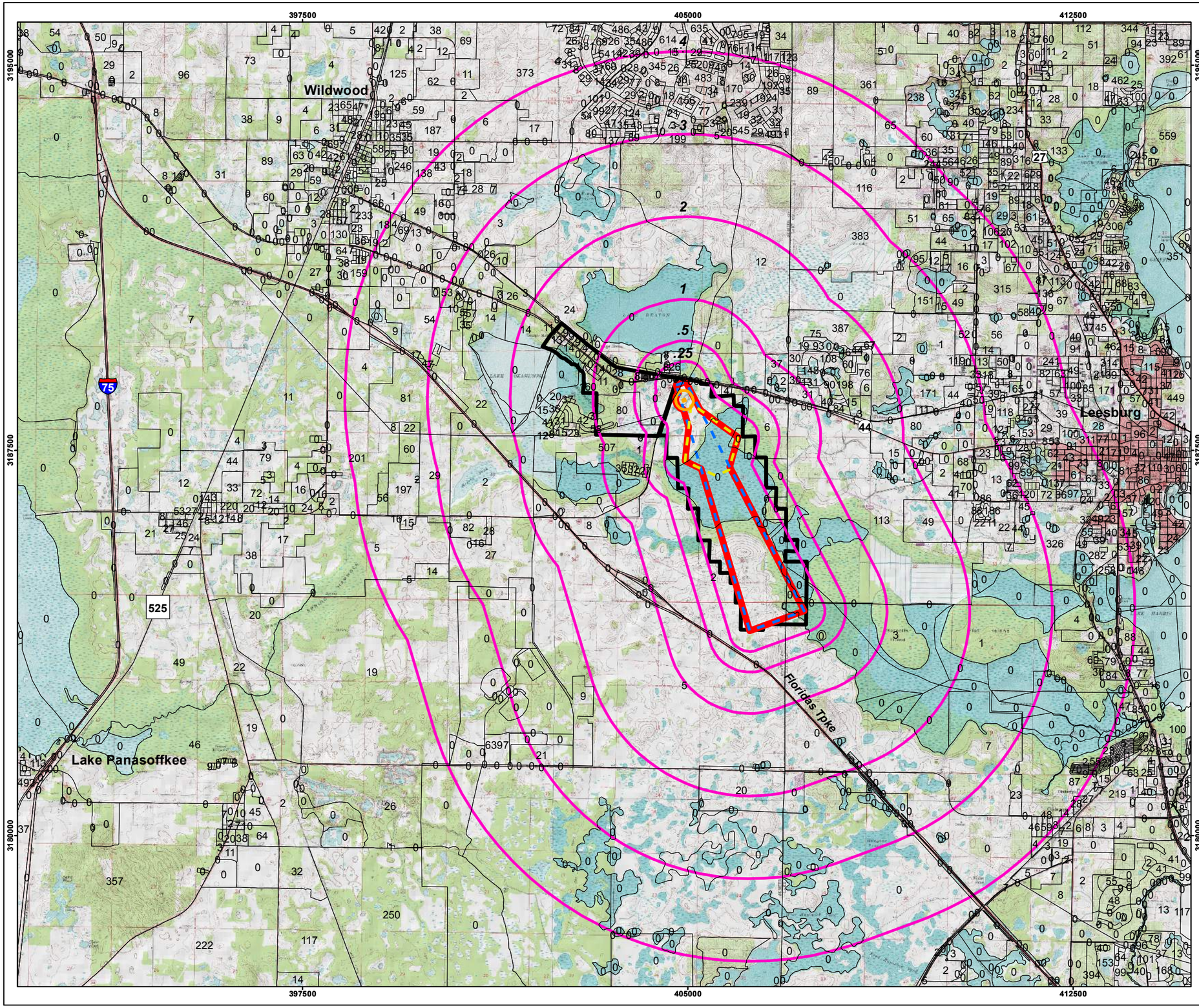
Figure 2.2

# 2010 Census Data
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- 4 — 2010 Census Block Boundary with Total Population
- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Hand Grenade Court MRS
- FUDS Boundary
- Buffer (Mile)


Site Location in Florida

N

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 17 NAD83, Map Units in Meters

2 1 0 2 Kilometers

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# CHAPTER 3
# SITE INSPECTION TASKS

## 3.1 HISTORICAL RECORD REVIEW

The existing body of information pertinent to the Leesburg ASC FUDS was thoroughly reviewed in advance of the TPP Meeting on January 6, 2011, and summarized to the TPP Team as part of the development and acceptance of the selected Technical Approach for the site. Sampling locations and QR planning were the direct result of this review process. This information has been augmented with institutional knowledge and additional documentation provided by the CEMVR, the U.S. Army Defense Ammunition Center and School, or obtained by Parsons during coordination of the field effort.

## 3.2 TECHNICAL PROJECT PLANNING SUMMARY

Leesburg ASC falls under the purview of the CESAJ. A TPP Meeting was facilitated by CESAJ on January 6, 2011, and consisted of representatives from CESAJ, USAESCH, City of Wildwood, Sumter County, FDEP, and Parsons. Unanimous TPP Team concurrence with the Technical Approach presented in the Final TPP Memorandum issued on January 25, 2011, was achieved (see Appendix B). The SS-WP Addendum reflects the TPP Team decisions resulting from the meeting as well as those directly resulting from follow-up actions. Key TPP facts and decisions are summarized below:

- The TPP Team concurred with the Technical Approach (supporting a potential NDAI recommendation for the Rifle Range and RI/FS for the Grenade Court) as presented and refined at the TPP Meeting on January 6, 2011.
- Mr. Robert Smith, City of Wildwood, stated that development was slated for the area in the vicinity of the MRSs. County Road 468 is expected to be expanded to four lanes. Currently, the Southern Oaks Industrial Park is going through the Development of Regional Impact (DRI) process. The DRI has reported potential archeological sites in the area near County Road 468 and the Sumter/Lake County line. Mr. Smith offered to supply Parsons with the DRI report. Ms. Peavy (City of Wildwood) stated she could supply Parsons with the DRI report.
    - On January 6, 2011, Ms. Peavy provided Parsons with a copy of the Southern Oaks DRI Map H – Master Development Plan (see Figure 4) and the contact information for the property owner/developer and the Withlacoochee Regional Planning Council.
- Mr. Smith stated that there are two property owners for this site, Bailey Brothers Inc. and Daryl Carter (Trustee), in addition to some county right-of-way (ROE) property.

- Review of Sumter County parcel maps indicates that Bailey Brothers Inc. is the property owner in the area of interest to this SI.

- Mr. Nuzie, FDEP, asked if the berm was still on-site. Parsons responded that the berm was still visible in 1964 aerials, but not visible in aerials that are more recent. It is possible, however, that the site is overgrown and the berm is still in place but not visible from the air.
- Parsons asked if anyone knew the discharge location for the retention pond on-site (located at the 100 yard firing point). Mr. Cottrell, Sumter County, said he would check the drainage plans and let us know.
- Springstead Engineering is the contractor who handled the road widening project. Mr. Cottrell stated that he would find out if there are aerial photos available from the road widening project.
    - Mr. Cottrell provided Parsons with the construction blueprints for the road-widening project on County Road 468. A drainage line and catchment basin were installed during the roadway expansion (see Figure 5). Construction of the drainage line and catchment basin may have affected areas within the MRSs where Parsons has proposed samples. Parsons considered this construction and moved the samples, as appropriate, during creation of the SS-WP Addendum.
- Mr. Nuzie stated that if the rifle range target berm is 100 yards long, more samples should be collected. Parsons agreed to add or move samples to the berm area, as appropriate, based on actual site conditions.
- Ms. Terry, USACE Huntsville, suggested that some metals analysis, and possibly perchlorate, might be needed for the MRS02- Grenade Court samples (currently only explosives analysis is proposed). Mr. Nuzie agreed, especially regarding the possibility of iron being a MC. Parsons agreed to research the potential MC from fragmentation grenades further and add select metals to the analysis list if appropriate.
    - Parsons has investigated the compounds associated with the fragmentation grenades. Approximately, 80% of the munitions weight is composed of iron. An additional 10% of the munitions weight is zinc. Both iron and zinc were analyzed for in the samples collected at the MRS02- Hand Grenade Court. Perchlorate is not a component of either the practice or fragmentation grenades used at this range.
- Mr. Nuzie stated that information should be documented thoroughly to support the no groundwater sampling decision. Additional information regarding groundwater near the MRSs is provided in the SS-WP Addendum.
- Twelve biased surface soil samples were collected within the MRS01- 300 Yard Known Distance Rifle Range. Two samples were collected at each of the three firing points and a minimum of six samples were collected at the berm. Four surface soil samples were collected within the MRS02- Hand Grenade Court.

Three ambient soil samples were collected outside the MRSs for use in the MRSPP scoring.

- No surface water/sediment samples were collected from this site.
- No groundwater sampling is planned at this time. There are no reported wells within either MRS. Depth to the water table is shallow (approximately 5 feet) in the northern part of the FUDS, therefore, surface water sampling is expected to be representative of groundwater. More information on groundwater conditions is included in the SS-WP Addendum.

## 3.3 NONMEASUREMENT DATA COLLECTION

The following sources were consulted for identifying biological and cultural resources at the Leesburg ASC FUDS:

- U.S. Geological Survey (USGS) – topographic map (USGS, 1980)
- U.S. Fish and Wildlife Service (USFWS), South Florida Multi-Species Recovery Plan (USFWS, 1999)
- USFWS, Florida Endangered Species List (USFWS, 2011b)
- USFWS, Endangered Species in Sumter County, FL—North Florida Ecological Services Office (USFWS, 2010)
- USFWS, National Wetlands Inventory – Wetlands Mapper (USFWS, 2011c)
- USFWS, National Wildlife Refuge System (USFWS, 2011d)
- USFWS, Critical Habitat Portal and Mapper Database (USFWS, 2011a)
- U.S. Forest Service. List of National Forests and Grasslands (U.S Forest Service, 2011)
- National Oceanic and Atmospheric Administration (NOAA), Coastal Zone Management Act and Program, National Marine Sanctuaries, Marine Protected Areas and National Estuarine Research Reserve System, Essential Fish Habitat (NOAA, 2010a, 2010b, 2010c, 2010d, 2010e, and 2010f)
- National Park Service. List of National Parks by State (National Park Service, 2011a)
- National Historic Landmarks Program (National Park Service, 2011b)
- National Heritage Areas Program. List of National Heritage Areas (National Park Service, 2011c)
- National Register of Historic Places (National Park Service, 2011d)
- Florida Natural Areas Inventory – Sumter County (FNAI, 2010)

## 3.4 SITE-SPECIFIC WORK PLAN ADDENDUM

3.4.1 The SS-WP Addendum (Parsons, 2010b) augments the PWP and PSAP, as warranted, to present pertinent site-specific information and procedural adjustments that

could not be readily captured in the programmatic documents or that resulted from TPP Team agreements that required modifying the preliminary SI Technical Approach.

3.4.2 The PWP and PSAP are intended to be umbrella documents that set overall programmatic objectives and approaches, whereas the SS-WP Addendum provides site-specific details and action plans. The PWP, PSAP, and SS-WP Addendum were taken to the site for reference by the SVT during SI field activities.

3.4.3 The SS-WP Addendum included the project description, the Field Investigation Plan, the Sampling and Analysis Plan (SAP), the Environmental Protection Plan (EPP), and the health and safety plan specific to the Leesburg ASC. The field investigation plan presented the approved Technical Approach to guide sample documentation of MEC/MD as well as collection and analysis for MC to ensure that the results were sufficient to meet the project Data Quality Objectives (DQOs).

3.4.4 The MRSs for the Leesburg ASC FUDS were anticipated to proceed to a ***NDAI for the MRS01- 300 Yard Known Distance Rifle Range and RIFS for the MRS02- Hand Grenade Court.*** The NDAI determination for the ***MRS01- 300 Yard Known Distance Rifle Range is*** based on historical evidence that this MRS consisted of conventional ordnance firing activities which occurred at the rifle range and included small arms (rifle and pistol). The location of the rifle range was confirmed through historical documentation and included 15 targets with 100-, 200-, and 300-yard firing points. The potential munitions used at the MRS01- 300 Yard Known Distance Rifle Range consisted of .22 Caliber, .30 Caliber, .38 Caliber, and .45 Caliber munitions. These munitions do not pose an explosive safety hazard if any remain on-site intact. The RI/FS determination for the MRS02- Hand Grenade Court is based upon the potential munitions used at this MRS includes hand practice grenades and hand fragmentation grenades. These munitions pose a residual explosive hazard [Trinitrotoluene (TNT)] if any remain at the site intact. No MEC or MD indicative of potential MEC has been found. No known public injury incidents have been reported since site closure. The SS-WP Addendum included a sampling rationale for each planned sample location and the latitude and longitude of the planned samples. The sampling rationale has been updated to include the location coordinates for the actual sample locations and is included in this report as Table 3.1.

3.4.5 The SAP discusses procedures for sample acquisition from locations biased toward the highest potential for MC contamination, Quality Control (QC) for the sampling process, sample shipment to an approved, independent laboratory, and analysis of the samples by the laboratory. The EPP evaluates compliance with Army Regulation 200-2 by presenting procedures for avoiding, minimizing, and mitigating potential impacts to environmental and cultural resources during site field activities. The Accident Prevention Plan (APP) supplements the programmatic accident prevention plan with site-specific emergency contact information and directions to the nearest hospital.

3.4.6 Sixteen surface soil samples were collected from site locations selected with maximum bias for the presence of MC contamination within the MRSs at the Leesburg ASC. The twelve biased surface soil sample identifications for MRS01- 300 Yard Known Distance Rifle Range are listed as LASC-MRS01-SS-02-01 through LASC-

MRS01-SS-02-12. The four biased surface soil samples for MRS02- Hand Grenade Court are listed as LASC-MRS02-SS-02-13 through LASC-MRS02-SS-02-16. All of the biased samples are located within the MRSs at the site. Three surface soil samples were collected from areas outside the MRSs but inside the FUDS boundary to serve as ambient metals data for comparison. The ambient sample identifications are as follows: LASC-AMB-SS-02-17, LASC-AMB-SS-02-18, and LASC-AMB-SS-02-19. QC samples were also collected from the site.

3.4.7 The biased soil samples LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-4 located at the firing points in MRS01- 300 Yard Known Distance Rifle Range were analyzed for explosives. The remaining biased soil samples (LASC-MRS01-SS-02-05 through LASC-MRS01-SS-02-12) within the MRS01- 300 Yard Known Distance Rifle Range were analyzed for select metals antimony, copper, and lead. The biased surface soil samples collected from the MRS02- Hand Grenade Court were analyzed for explosives, iron, and zinc. Additionally, the ambient samples collected outside of the MRSs were analyzed for antimony, copper, iron, lead, and zinc.

## 3.5 SITE VISIT ACTIVITIES

Site visit activities were conducted on August 24, 2011. In general, the site visit activities included QR (including the collection of site observations relevant to MEC/MD seen and other DoD related activity) and anomaly avoidance. MC samples were also collected. Site visit activities are described in Chapter 3 – Field Investigation Plan of the SS-WP Addendum (Parsons, 2010b) and in Chapter 4 of this SI Report. Activities conducted on a daily basis are identified in the daily reports. These reports are included in Appendix D.

## 3.6 DEPARTURES FROM PLANNING DOCUMENTS

3.6.1 To ensure that the biased samples collected were representative of the most biased locations within the MRS, samples LASC-MRS01-SS-02-05 through LASC-MRS01-SS-02-12 were relocated to the berm that the SVT observed while conducting QR. The QR was slightly adjusted due to dense vegetation and to include the location of the berm.

3.6.2 APPL is the analytical laboratory used to analyze the samples collected from the Leesburg ASC FUDS instead of Test America. The original PSAP indicated the laboratory used for this site would be TestAmerica-Denver. However, approval was received from USACE to use APPL as the laboratory for this site on July 25, 2011. All other sample collection procedures presented in the Final PSAP (USACE, 2005) and the Parsons Final PSAP Addendum (Parsons, 2006) were followed

**Table 3.1**
**SAMPLING RATIONALE**
**Leesburg ASC, Sumter County, Florida**

| Sample ID | Sample Coordinates Latitude | Longitude | Media | Analysis [1, 2,3] | Historical Use of Munitions in Area | Rationale |
|---|---|---|---|---|---|---|
| LASC- MRS01-SS-02-01 | 28.821539 | -81.97415 | Surface Soil | Explosives | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected near the 300-yard firing point of the rifle range |
| LASC- MRS01-SS-02-02 | 28.821683 | -81.973769 | Surface Soil | Explosives | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected near the 300-yard firing point of the rifle range |
| LASC- MRS01-SS-02-03 | 28.82085 | -81.973686 | Surface Soil | Explosives | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected near the 200-yard firing point of the rifle range |
| LASC- MRS01-SS-02-04 | 28.820969 | -81.973308 | Surface Soil | Explosives | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected near the 200-yard firing point of the rifle range |
| LASC- MRS01-SS-02-05 | 28.819405707 | -81.973225819 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-06 | 28.819484147 | -81.972958088 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-07 | 28.819595592 | -81.97279221 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-08 | 28.819657368 | -81.972511091 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-09 | 28.819713485 | -81.972426369 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-10 | 28.81970786 | -81.972332388 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-11 | 28.819771255 | -81.972243156 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC- MRS01-SS-02-12 | 28.81982374 | -81.972158156 | Surface Soil | Antimony, copper, lead | Small Arms, Cartridge, .30 Caliber; Cartridge, .45 Caliber | Sample was collected at the rifle range impact area. |
| LASC-MRS02-SS-02-13 | 28.820356038 | -81.974480108 | Surface Soil | Explosives, iron, and zinc | Hand Grenades, Practice, Fragmentation | Sample was collected within the Hand Grenade Court MRS. |
| LASC-MRS02-SS-02-14 | 28.820427591 | -81.974315544 | Surface Soil | Explosives, iron, and zinc | Hand Grenades, Practice, Fragmentation | Sample was collected within the Hand Grenade Court MRS. |
| LASC-MRS02-SS-02-15 | 28.820226378 | -81.974546324 | Surface Soil | Explosives, iron, and zinc | Hand Grenades, Practice, Fragmentation | Sample was collected within the Hand Grenade Court MRS. |

**Table 3.1**
**SAMPLING RATIONALE**
**Leesburg ASC, Sumter County, Florida**

| Sample ID | Sample Coordinates Latitude | Longitude | Media | Analysis (1, 2,3) | Historical Use of Munitions in Area | Rationale |
|---|---|---|---|---|---|---|
| LASC-MRS02-SS-02-16 | 28.820286 | -81.974242 | Surface Soil | Explosives, iron, and zinc | Hand Grenades, Practice, Fragmentation | Sample was collected within the Hand Grenade Court MRS. |
| LASC- AMB-SS-02-17 | 28.820662099 | -81.977206361 | Surface Soil | Antimony, copper, iron, lead, and zinc | None | Sample was collected outside of the MRSs, but within the FUDS boundary to represent ambient conditions. |
| LASC- AMB-SS-02-18 | 28.819852982 | -81.977584376 | Surface Soil | Antimony, copper, iron, lead, and zinc | None | Sample was collected outside of the MRSs, but within the FUDS boundary to represent ambient conditions. |
| LASC- AMB-SS-02-19 | 28.821608936 | -81.976844015 | Surface Soil | Antimony, copper, iron, lead, and zinc | None | Sample was collected outside of the MRSs, but within the FUDS boundary to represent ambient conditions. |

(1) See Table 4.1 for complete list of analytes.

(2) Parsons has selected antimony, copper, and lead as our programmatic SI "indicator" heavy metals list and reflects our general former small arms range (SAR) evaluation strategy and parallels the screening level decision-making objectives of SI. Iron and zinc are included as a result of the potential munitions utilized at former grenade ranges. This metals list was developed based on an extensive review of historical SAR studies, fate and transport mechanisms (specifically as they relate to shallow surface soil sampling), compositional prevalence, toxicity, environmental persistence and reactivity, and representativeness. This baseline list may be augmented, as appropriate, following TPP based on justifications of unique site specific considerations such as soils, geology, vegetation, topography, hydrology, land use, or ammunition type.

(3) Explosives were only analyzed if sample is collected from near a firing point.

# CHAPTER 4
# MUNITIONS AND EXPLOSIVES OF CONCERN FINDINGS

## 4.1 GENERAL INFORMATION

### 4.1.1 Qualitative Reconnaissance

4.1.1.1 The primary task of the SI is to assess the absence or presence of MEC and MD. During the sampling event (August 24, 2011), the SVT visually scanned the two MRSs at the Leesburg ASC FUDS. ***MEC or MD were not observed within the MRS01- 300 Yard Known Distance Rifle Range or the MRS02- Hand Grenade Court during the SI.***

4.1.1.2 The QR consisted of visual reconnaissance of the site surface to identify indicators of suspect areas including earthen berms, distressed vegetation, craters, target remnants, and visible metallic debris. The SVT conducted QR throughout the MRSs and at the Leesburg ASC FUDS, proceeding in a meandering path format traversing the MRSs from one sampling location to the next on or near the probable target areas for an approximate QR length of 1.7 miles. ***Within the MRS01- 300 Yard Known Distance Rifle Range, a berm approximately 10 feet high and 400 feet in length was observed by the SVT; no MEC or MD was observed. Within the MRS02- Hand Grenade Court, no remnants of the court remain at the site and no MEC or MD was observed by the SVT.***

4.1.1.3 The QR involved a three-person SVT traversing throughout the MRSs at the site. The SVT stopped occasionally to note field observations and Figure 4.1 depicts the observation locations at the site. The SVT stopped at locations throughout the two MRSs to take photographs and to note field conditions, vegetation, or other features of interest. As discussed in the SS-WP Addendum (Parsons, 2010b), surface soil and surface water/sediment sample couples were planned for the Leesburg ASC FUDS. Minor modifications were needed to the sampling and QR path because of lack of ROEs. Figure 4.1 displays the actual QR path followed by the SVT. Table 4.1 presents the potential MEC anticipated to be present at the site based on the 1994 INPR, 2004 INPR Supplement, and 2010 HRR. The MEC Conceptual Site Exposure Model (CSEM) is included in Appendix J.

**Table 4.1**
**Chemical Composition of MEC and Potential Munitions Constituents**
**Leesburg ASC, Sumter County, Florida**

| MRS | Munitions Type/Model | Composition (Case and Filler)[1] | MC Analysis[2] |
|---|---|---|---|
| **MRS01 – 300 Yard Known Distance Rifle Range (including pistol use)** | Small Arms General: **Cartridge, .22 Caliber** | **Cartridge case: Copper Alloy –** Copper, Iron, Lead, Zinc<br>**Propellant:** Dibutylphthalate, Diphenylamine, Nitrocellulose[5], Nitroglycerin<br>**Primer[12]:** Antimony Sulfide, Barium Nitrate, Calcium Silicide, Copper, Iron, Lead, Lead Styphnate, Nitrocellulose[5], Pentaerythritol Tetranitrate (PETN), Tetrazene, Zinc<br>**Projectile**: Antimony, Copper, Iron, Lead, Zinc | **Metals[3]**<br>Antimony, Copper, Lead<br>**Explosives [4]**<br>A full explosives panel was analyzed from media collected at the firing lines of this MRS. |
| | Small Arms General: **Cartridge, .30 Caliber (includes carbine)** | **Cartridge case: Copper Alloy –** Copper, Iron, Lead, Zinc<br>**Propellant:** Calcium Carbonate, Copper, Dibutylphthalate, Diphenylamine, Dinitrotoluene[6], Ethyl Centralite, Lead, Iron, Nitrocellulose[5], Nitroglycerin, Potassium Nitrate, Sodium Sulfate, Zinc<br>**Primer[7]:** Aluminum Powder, Antimony Sulfide, Barium Nitrate, Copper, Iron, Lead, Lead Styphnate, PETN, Tetrazene, Zinc<br>**Projectile**: Antimony, Carbon, Copper, Iron, Lead, Manganese, Silicon, Sulfur, Zinc<br>**Tracer[8]:** Barium Peroxide, Calcium Resinate, Magnesium Powder, Polyvinyl Chloride, Strontium Nitrate, Strontium Oxalate, Strontium Peroxide, Zinc Stearate | **Metals[3]**<br>Antimony, Copper, Lead<br>**Explosives [4]**<br>A full explosives panel was analyzed from media collected at the firing lines of this MRS. |
| | Small Arms General: **Cartridge, .38 Caliber** | **Cartridge case: Copper Alloy –** Copper, Iron, Lead, Zinc<br>**Propellant:** Dinitrotoluene[6], Diphenylamine, Ethyl Centralite, Nitrocellulose[5], Nitroglycerin, Potassium Sulfate<br>**Primer[12]:** Aluminum Powder, Antimony Sulfide, Barium Nitrate, Calcium Silicide, Copper, Iron, Lead Oxide, Lead Styphnate, Nitrocellulose[5], Pentaerythritol Tetranitrate (PETN), Tetrazene, Zinc<br>**Projectile**: Antimony, Copper, Iron, Lead, Zinc | **Metals[3]**<br>Antimony, Copper, Lead<br>**Explosives [4]**<br>A full explosives panel was analyzed from media collected at the firing lines of this MRS. |
| | Small Arms General: **Cartridge, .45 Caliber** | **Cartridge case: Copper Alloy –** Copper, Iron, Lead, Zinc<br>**Propellant:** Diphenylamine, Dinitrotoluene[6], Nitrocellulose[5], Nitroglycerin, Potassium Nitrate, Potassium Sulfate<br>**Primer[7]:** Antimony Sulfide, Barium Nitrate, Calcium Silicide, Copper, Iron, Lead Styphnate, Lead Thiocyanate, Nitrocellulose[5], PETN, Potassium Chlorate, Tetrazene, Trinitrotoluene (TNT), Zinc<br>**Projectile**: Antimony, Carbon, Copper, Iron, Lead, Manganese, Phosphorus, Silicon, Sulfur, Zinc<br>**Tracer[8]:** Barium Peroxide, Calcium Resinate, Magnesium, Strontium Nitrate, Strontium Oxalate, Strontium Peroxide, Zinc Stearate | **Metals[3]**<br>Antimony, Copper, Lead<br>**Explosives [4]**<br>A full explosives panel was analyzed from media collected at the firing lines of this MRS. |

## Table 4.1
## Chemical Composition of MEC and Potential Munitions Constituents
## Leesburg ASC, Sumter County, Florida

| MRS | Munitions Type/Model | Composition (Case and Filler)(1) | MC Analysis(2) |
|---|---|---|---|
| MRS02 – Hand Grenade Court | Grenade, Hand, Practice, MkII(9) | **Grenade Body: Cast Iron –** Aluminum, Carbon, Chromium, Cobalt, Copper, Iron, Manganese, Molybdenum, Nickel, Phosphorus, Silicon, Sulfur, Vanadium, Zinc<br>**Grenade Filler: Black Powder –** Potassium Nitrate, Sodium Nitrate, Sulfur<br>**Fuze, Grenade, Delay, M10: Zinc Alloy/Aluminum Alloy –** Aluminum, Copper, Iron, Lead, Magnesium, Tin, Zinc<br>**Primer/Delay**(7): Barium Nitrate, Copper, Lead Sulphocyanate, Potassium Chlorate, Potassium Nitrate, Silicon, Sodium Nitrate, Sulfur, Trinitrotoluene (TNT), Zinc | **Metals**<br>Iron, Zinc<br>**Explosives** (4)<br>As a conservative measure, a full explosives panel was analyzed from media collected at this MRS. |
| | Grenade , Hand, Fragmentation, MkII(9) | **Munition Case: Cast Iron -** Carbon, Iron, Manganese, Phosphorus, Sulfur<br>**Munition Filler: EC Blank Powder or Trinitrotoluene (TNT) -**Aurine Dye, Barium Nitrate, Diphenylamine, Nitrocellulose(6), Potassium Nitrate, Trinitrotoluene (TNT)<br>**Fuze, Grenade, Delay, M204: Zinc Alloy, Aluminum Alloy -** Aluminum, Barium Chromate, Chromium, Lead Azide, Nickel, PETN (Pentaerythritol Tetranitrate), Potassium Perchlorate, Cyclotrimethylenetrinitramine (RDX), Tetryl, Titanium, Zinc, Zirconium<br>**Fuze Primer(7):** Antimony Sulfide, Calcium Silicide, Lead Thiocyanate, Potassium Chlorate, Tetrazene, Trinitrotoluene (TNT) | **Metals**<br>Iron, Zinc<br>**Explosives** (4)<br>As a conservative measure, a full explosives panel was analyzed from media collected at this MRS. |

(1) MC not selected for analysis are essential nutrient metals, Semi-Volatile Organic Compounds (SVOCs) or materials that represent a very small percentage of the munitions weight.

(2) MC selected for analysis are typically non-essential nutrient metals and indicative of known or suspected DOD munitions used at this MRS.

(3) Parsons has selected antimony, copper, and lead as our programmatic SI "indicator" heavy metals list and reflects our general former small arms range (SAR) evaluation strategy and parallels the screening level decision-making objectives of SI. This three metals list was developed based on an extensive review of historical SAR studies, fate and transport mechanisms (specifically as they relate to shallow surface soil sampling), compositional prevalence, toxicity, environmental persistence and reactivity, and representativeness. This baseline list may be augmented, as appropriate, following the TPP meeting based on justifications of unique site-specific considerations such as soils, geology, vegetation, topography, hydrology, land use, or ammunition type.

(4) A full explosives panel was analyzed from media collected at known firing points of small arms ranges. As a conservative measure, Parsons' policy is to include all explosives when analyzing for explosive MC.

(5) Nitrocellulose is not considered toxic, has no risk-based screening values and there are no chemical analysis techniques that quantify nitrocellulose separately from the natural common essential nutrient nitrate. Based on this, nitrocellulose analysis will not be conducted during this SI.

(6) Dinitrotoluene products include: 2,4-and 2,6-dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2- and 3-nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-nitrotoluene.

(7) Primer materials represent a very small percentage of the munition's weight. Therefore, analysis of primer constituents will not be conducted. However, if a primer constituent is associated with a larger component of the munition, then analysis of that constituent may be conducted.

(8) Tracer element materials represent a very small percentage of the munitions weight and is consumed while the projectile travels to the target, therefore, tracer element constituents will not be analyzed for at this MRS (if a tracer element constituent is associated with a larger component of the munition it may be analyzed for).

(9) The munitions listed in the MRS02- Hand Grenade Court are grenades that were utilized during the range use era (1942-1945).
**Source**: Munitions information was supplied by the 1994 INPR, 2004 INPR Supplement, 2010 HRR, Munitions Items Disposition Action System (MIDAS) database, and USACE Range Operations Reports RO-14.

4.1.1.5 As shown in Appendix E, the SVT noted discrete field observations throughout the course of the SI including detail on sample locations and terrain. Pertinent field observations are summarized in Table 4.2. Appendix D includes related field forms.

**Table 4.2**
**Summary of Qualitative Reconnaissance Observations**
**Leesburg ASC**

| MRS | MEC | MD | Munitions-Related Features |
|---|---|---|---|
| MRS01– 300 Yard Known Distance Rifle Range | None observed | None observed | 10 feet high and 400 feet in length berm was observed |
| MRS02– Hand Grenade Court | None Observed | None observed | None observed |

## 4.2 Data Quality Objectives

### 4.2.1 Introduction

4.2.1.1 DQOs are qualitative and quantitative statements that clarify study objectives and specify the type and quality of the data necessary to support decisions. The development of DQOs for a specific site takes into account factors that determine whether the quality and quantity of data are adequate for project needs, such as data collection, uses, types, and needs. While developing these DQOs in accordance with the process presented in Chapter 3, paragraph 3.1.2 of the PWP, Parsons followed the *Guidance on Systematic Planning Using the Data Quality Objectives Process*, USEPA QA/G-4, USEPA/240/B-06/001 (USEPA, 2006).

4.2.1.2 The goal of the TPP process is to achieve stakeholder, USACE, and applicable state and federal regulatory concurrence with the DQOs for a given site. The TPP Team discussed the Leesburg ASC DQOs at the TPP Meeting held on January 6, 2011. Appendix B of this SI Report presents the TPP documentation. Tables 4.3 through 4.6 present the DQO worksheets. ***All the DQOs for the MRSs have been met.***

4.2.1.3 As stated in section 1.2 of this SI Report, data must be sufficient to do the following: 1) determine whether a removal action is necessary; 2) enable HRS scoring by the USEPA; 3) characterize the release for effective and rapid initiation of a RI/FS; and 4) complete the MRSPP.

4.2.1.4 DQOs cover four project objectives that SI data must satisfy: 1) evaluate potential presence of MEC; 2) evaluate potential presence of MC; 3) collect data needed to complete MRSPP scoring sheets; and 4) collect information for HRS scoring.

### 4.2.2 Munitions and Explosives of Concern Data Quality Objective

The MEC DQO was achieved by evaluating potential presence of MEC at the Leesburg ASC site. The SVT searched for visual evidence of MEC and MD throughout

the MRSs at the Leesburg ASC while conducting the QR. No MEC or MD were observed at the MRSs. However, within the MRS01– 300 Yard Known Distance Rifle Range, the SVT observed a berm that was approximately 400 feet long and 10 feet high. No MEC or MD were observed within the berm at the site.

### 4.2.3 Munitions Constituents Data Quality Objective

4.2.3.1 The MC DQO was achieved by evaluating potential presence of MC at the Leesburg ASC site. The TPP Team evaluated the composition of the munitions (and fillers) used at the MRSs at the Leesburg ASC FUDS and developed a list of compounds/analytes for sample analysis. The complete list of munitions potentially used at the Leesburg ASC FUDS and their chemical composition is provided in Table 4.1. Chapter 5 presents the MC sampling results.

4.2.3.2 Parsons uses the potential MC list as a guide for developing a list of MC specific for each SI project. Varying quantities of the listed MC are found in munitions depending upon the type of munitions of interest. Parsons focuses on the major MC that are likely found in higher amounts of the complete munitions and those potentially hazardous MC that may remain on-site at concentrations that may be hazardous to human health and the environment. Because USACE cannot respond to non-CERCLA hazardous substances under the FUDS program, the MC analytes selected are typically limited to CERCLA-hazardous substances. In addition, some major MC are the same as common materials found in the environment in high quantities (such as magnesium, potassium, manganese, iron, and others depending on the type of native soils and waters). Some of these MC also are key nutrients for humans, flora, and fauna and are not expected to pose a risk to those potential receptors. Parsons evaluates all of these factors when selecting the key target MC for the project. There are occasions when the selection of the metals will deviate from this process, typically during the TPP and SS-WP stages to address local and/or state regulatory concerns. Chapter 5 presents the MC sampling results (Tables 5.3).

### 4.2.4 Munitions Response Site Prioritization Protocol Data Quality Objective

The MRSPP DQO was achieved by obtaining sufficient information to complete the MRSPP scoring sheets. Specific input data were collected and the three modules for the MRSPP were populated as part of the SI. The scoring sheets for the MRSPP are included in Appendix K.

### 4.2.5 Hazard Ranking System Data Quality Objective

The HRS DQO was achieved by including information in the SI report necessary for the USEPA to populate the HRS score sheets. Source documents for the HRS information include the INPR, INPR Supplement, and HRR documents, as well as the MC sampling results reported in Chapter 5 and information from local and state agencies regarding population, groundwater well users, and drinking water well use.

## 4.3 MRS01 – 300 YARD KNOWN DISTANCE RIFLE RANGE

### 4.3.1 Historical Munitions and Explosives of Concern

Information provided in the INPR, INPR Supplement, and HRR reported findings, visual observations, and other sources was used to develop the list of known or potential MEC items for the Leesburg ASC site. The potential munitions used at the MRS01– 300 Yard Known Distance Rifle Range include .22 Caliber, .30 Caliber, .38 Caliber, and .45 Caliber small arms munitions. No MEC or MD has been found nor have any related injuries been reported since site closure.

### 4.3.2 Inspection Activities

The SI field effort for the MRS01– 300 Yard Known Distance Rifle Range was conducted August 24, 2011. The SVT collected twelve biased surface soil samples, and one ambient surface soil sample, plus QC samples from the site. QR was conducted to observe any MEC or MD on the surface of the MRS. A berm approximately 10 feet high and 400 feet in length was observed by the SVT. Biased samples LASC-MRS01-SS-02-05 through LASC-MRS01-SS-02-12 were collected from the berm. No evidence of MEC or MD was observed during the sampling event. Photographs and site observations collected in this MRS are included in Appendix E.

## 4.4 MRS02 – HAND GRENADE COURT

### 4.4.1 Historical Munitions and Explosives of Concern

Information provided in the INPR, INPR Supplement, and HRR reported findings, visual observations, and other sources was used to develop the list of known or potential MEC items for the Leesburg ASC site. The potential munitions used at the MRS02– Hand Grenade Court include live hand fragmentation grenades and hand practice grenades. No MEC or MD has been found nor have any related injuries been reported since site closure.

### 4.4.2 Inspection Activities

The SI field effort for the MRS02– Hand Grenade Court was conducted August 24, 2011. The SVT collected four biased surface soil samples, and two ambient surface soil samples, plus QC samples from the site. QR was conducted to observe any MEC or MD on the surface of the MRS. No evidence of the former grenade court, MEC, or MD was observed during the sampling event. Photographs and site observations collected in this MRS are included in Appendix E.

**Table 4.3 - MEC Data Quality Objective Worksheet**

SITE: **Leesburg ASC, Sumter County, FL**

PROJECT: **MMRP Site Inspection / FUDS No. I04FL014301**

| DQO Element Number * | DQO Element Description * | Site-Specific DQO Statement | Objective Met? Yes (Y)/No (N) |
|---|---|---|---|
| **Intended Data Use(s):** | | | |
| 1 | Project Objective(s) Satisfied | Evaluate presence/lack there of MEC. | Y |
| **Intended Need Requirements:** | | | |
| 2 | Data User Perspective(s) | Risk, Remedy | Y |
| 3 | Contaminant or Characteristic of Interest | MEC, MD | Y |
| 4 | Media of Interest | N/A | N/A |
| 5 | Required Sampling Locations or Areas and Depths | MRS01– 300 Yard Known Distance Rifle Range<br>MRS02– Hand Grenade Court | Y |
| 6 | Number of Samples Required | N/A | N/A |
| 7 | Reference Concentration of Interest or Other Performance Criteria | Indication of target areas. Visual Confirmation of absence/presence of MEC. | Y |
| **Appropriate Sampling and Analysis Methods:** | | | |
| 8 | Sampling Method | Qualitative Reconnaissance | Y<br>QR length approximately 1.7 miles |
| 9 | Analytical Method | N/A | N/A |

* Refer to EM 200-1-2, Paragraph 4.2.1

**Table 4.4 - MC Data Quality Objective Worksheet**

SITE: **Leesburg ASC, Sumter County, FL**

PROJECT: **MMRP Site Inspection / FUDS No. I04FL014301**

| DQO Element Number* | DQO Element Description* | Site-Specific DQO Statement | Objective Met? Yes (Y)/No (N) |
|---|---|---|---|
| **Intended Data Use(s):** | | | |
| 1 | Project Objective(s) Satisfied | Evaluate presence/lack thereof of MC | Y |
| **Intended Need Requirements:** | | | |
| 2 | Data User Perspective(s) | Risk, Remedy | Y |
| 3 | Contaminant or Characteristic of Interest | Total Explosives at firing points, and Selected Metals | Y |
| 4 | Media of Interest | Surface soil | Y |
| 5 | Required Sampling Locations or Areas and Depths | As determined by the TPP Team and SVT, see Figure 5.1. Locations based on MRS configurations | Y |
| 6 | Number of Samples Required | Sixteen biased surface soil samples, three ambient surface soil samples, plus QC samples | Y |

**Table 4.4 - MC Data Quality Objective Worksheet (Continued)**

SITE: **Leesburg ASC, Sumter County, FL**

PROJECT: **MMRP Site Inspection / FUDS No. I04FL014301**

| DQO Element Number* | DQO Element Description* | Site-Specific DQO Statement | Objective Met? Yes (Y)/No (N) |
|---|---|---|---|
| 7 | Reference Concentration of Interest or Other Performance Criteria | The soil screening values for human health at the MRSs, consist of the more stringent of the USEPA Regional Screening Level (RSLs) for Chemical Contaminants at Superfund Sites for Residential Soil, November 2010, and the FDEP Florida Administrative Code (FAC) 62-777 Soil Cleanup Target Levels (SCTLs) (the more stringent of Direct Exposure Residential, Leachability Based on Freshwater Surface Water Criteria, and Leachability based on Groundwater Criteria), February 2005. The Ecological Screening Values (ESVs) for surface soil at both MRSs consist of the USEPA Region 4 ESVs for Soil, November 30, 2001. When Region 4 ESVs are not available, ESVs were obtained from the most recent version of the sources referenced in the PSAP Addendum. The soil screening values for ecological risk consist of the USEPA Region 4 ESVs, updated November 30, 2001. When Region 4 ESVs are not available, ESVs were obtained from the most recent version of the sources referenced in the 2006 PSAP Addendum. | Y – Most up-to-date screening values used. |
| **Appropriate Sampling and Analysis Methods:** | | | |
| 8 | Sampling Method | Discrete samples in accordance with the FDEP and TPP Team concurrence | Y |
| 9 | Analytical Method | Explosives - SW8321A<br>Metals- SW6020, SW6010B | Y |

* Refer to EM 200-1-2, Paragraph 4.2.

**Table 4.5 - MRSPP Data Quality Objective Worksheet**

| Site: | Leesburg ASC, Sumter County, FL | | | | |
|---|---|---|---|---|---|
| **Project:** | MMRP Site Inspection / FUDS No. I04FL014301 | | | | |
| **Module** | **Table #** | **Table Description** | **Known Data** | **Current Data Gap** | **Data Source** |
| **Explosive Hazard Evaluation (EHE)** | 1 | Munitions Type | X | | Historical Records/Findings |
| | 2 | Source of Hazard | X | | Historical Maps |
| | 3 | Location of Munitions | X | | Historical or Field Findings |
| | 4 | Ease of Access | X | | Field Findings |
| | 5 | Status of Property | X | | Historical Records |
| | 6 | Population Density | X | | U.S. Census Bureau |
| | 7 | Population Near Hazard | X | | Field Findings |
| | 8 | Types of Activities/Structures | X | | Regional Zoning |
| | 9 | Ecological and/or Cultural Resources | X | | State Historic Preservation Office |
| | 10 | Determining the EHE | X | | Scores from Tables 1 through 9 |
| **Chemical Warfare Materiel (CWM) Hazard Evaluation (CHE)** | 11 | CWM Configuration | X | | Historical Records/Findings |
| | 12 | Sources of CWM | X | | Historical Records/Findings |
| | 13 | Location of CWM | X | | Historical or Field Findings |
| | 14 | Ease of Access | X | | Field Findings |
| | 15 | Status of Property | X | | Historical Records |
| | 16 | Population Density | X | | U.S. Census Bureau |
| | 17 | Population Near Hazard | X | | Field Findings |
| | 18 | Types of Activities/Structures | X | | Regional Zoning |
| | 19 | Ecological and/or Cultural Resources | X | | State Historic Preservation Office |
| | 20 | Determining the CHE | X | | Scores from Tables 11 through 19 |
| **Health Hazard Evaluation (HHE)** | 21 | Groundwater Data | X | | N/A |
| | 22 | Surface Water - Human Endpoint | X | | N/A |
| | 23 | Sediment - Human Endpoint | X | | N/A |
| | 24 | Surface Water - Ecological Endpoint | X | | N/A |
| | 25 | Sediment - Ecological Endpoint | X | | N/A |
| | 26 | Surface Soil | X | | Surface Soil Sampling Results |
| | 27 | Supplemental Contaminant Hazard Factor | X | | All MC Sampling Results |
| | 28 | Determining the HHE | X | | Scores from Tables 21 through 27 |
| | 29 | MRS Priority | X | | Scores from Tables 10, 20, and 28 |
| | A | MRS Background Information | X | | DoD Databases |

**Table 4.6 - HRS Data Quality Objective Worksheet**

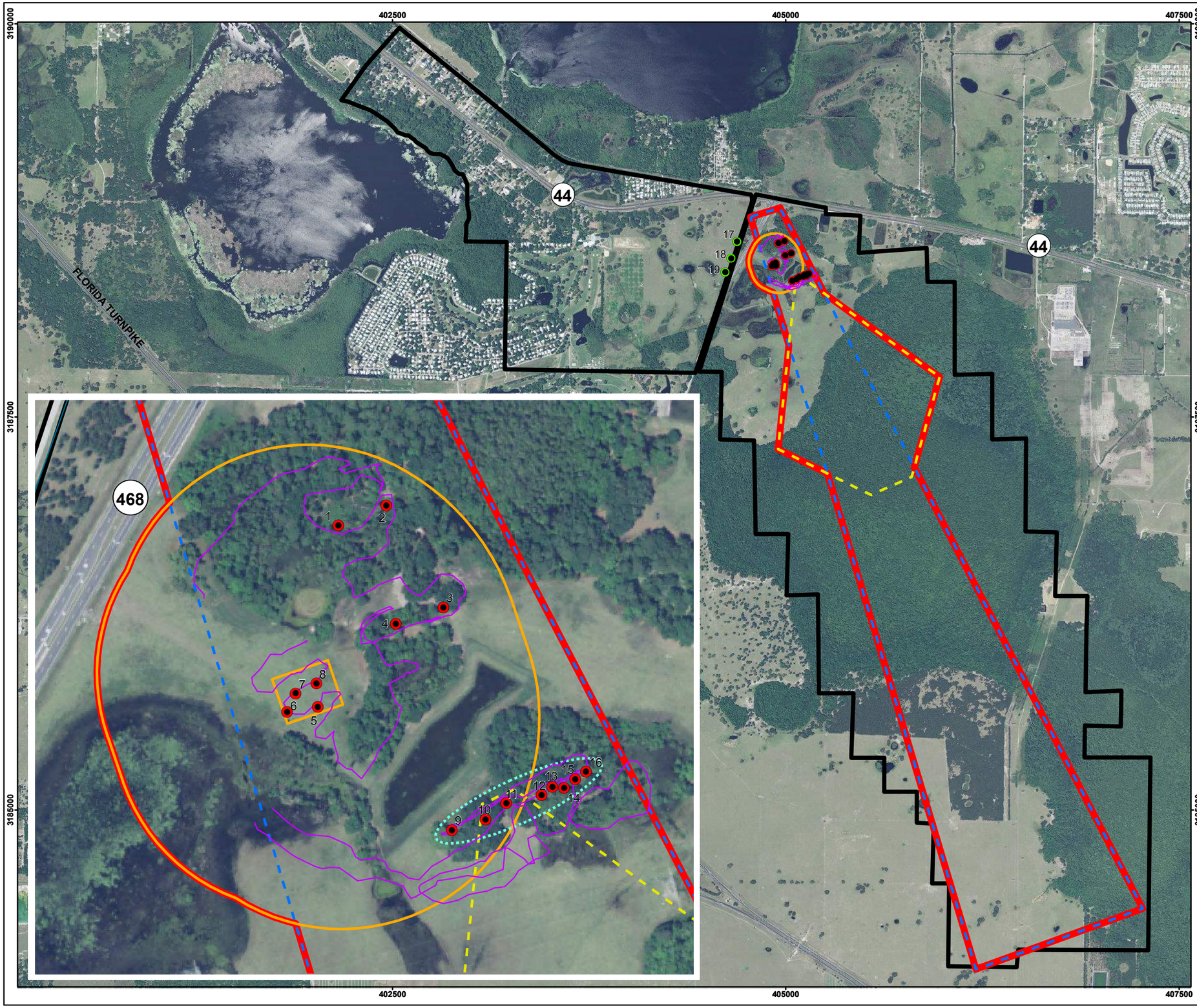
**Site:** Leesburg ASC, Sumter County, FL
**Project:** MMRP Site Inspection / FUDS No. I04FL014301
**DQO Statement Number:** 4 of 4

| Data Description | Known Data | Current Data Gap | Data Source |
|---|---|---|---|
| Source Type | X | | Historical Records/Findings |
| Estimated Volume or Area | X | | Field Findings |
| Hazardous Substance | X | | Constituents of Suspected Munitions |
| Groundwater Sample Concentration | X | | N/A |
| Groundwater Use | X | | Well Records/Municipal Data |
| Surface Water Sample Concentration | X | | N/A |
| Surface Water Pathways | X | | N/A |
| Soil Sample Concentration | X | | Sample Results |
| Soil Pathways | X | | Municipal Data |
| Sensitive Environments | X | | State Historic Preservation Office, US Fish and Wildlife Service, various government agencies |
| Attractiveness/Accessibility | X | | Field Findings/Land Use Records |

Figure 4.1

# Qualitative Reconnaissance and Field Observation Locations Leesburg Air Service Center FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- Observation Location
- Soil Sample Location
- Ambient Soil Sample Location
- Qualitative Reconnaissance Track
- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Berm Location
- Hand Grenade Court MRS
- FUDS Boundary


Site Location in Florida

N

Image: 2010 Orthophotos
Projection: UTM Zone 17 NAD83, Map Units in Meters

800 400 0 800 Meters

| | |
|---|---|
| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

| | | | |
|---|---|---|---|
| DESIGNED BY: BT | **Qualitative Reconnaissance and Field Observation Locations** | | |
| DRAWN BY: BT | | | |
| CHECKED BY: TB | SCALE: As Shown | PROJECT NUMBER: 748037.10014 | |
| SUBMITTED BY: TD | DATE: December 2011 | PAGE NUMBER: 4-12 | |
| | FILE: X:\GIS\Site_inspections_ne\Maps\leesburg_FL\Fig4_1.mxd | | |

# CHAPTER 5
# EXPOSURE PATHWAYS AND RECEPTORS

## 5.1 INTRODUCTION

5.1.1 This chapter of the SI report evaluates the potential presence or absence of exposure pathways and receptors, based on site-specific conditions. It is necessary to evaluate site-specific conditions and land use to evaluate risks posed to potential receptors under current and future land use scenarios. Exposure pathways for groundwater, surface water and sediment, soil, and air were evaluated. The CSEM for the former Leesburg ASC (Appendix J) summarizes which potential receptor exposure pathways are (or may be) complete and which are (and are likely to remain) incomplete. An exposure pathway is not complete unless all four of the following factors (in *italics*) are present (USEPA, 1989). An example regarding a hypothetical groundwater pathway is included.

- *A source and mechanism for contaminant release*. For example, a site has known MEC from which MC have leached and contaminated surface soil.
- *An environmental transport and/or exposure medium*. In the example, the MC in soil are mobile and can contaminate groundwater.
- *A point of exposure at which the contaminant can interact with a receptor*. A well drawing from the contaminated aquifer is at the MRS.
- *A receptor and a likely route of exposure at the exposure point*. A resident uses groundwater from the on-site well as a source of drinking water.

5.1.2 In the hypothetical example above, all four factors are present and, therefore, the groundwater exposure pathway is complete. If any single factor was not present (for example, MC were not present in soil, or the resident obtained drinking water from another source), the pathway would be incomplete.

5.1.3 This chapter presents the information required to evaluate whether exposure pathways at the site are complete. It also identifies those MC that require further consideration in a Screening Level Risk Assessment (SLRA). Chapter 6 assesses the potential significance of complete pathways (such as whether there is an unacceptable risk).

## 5.2 GENERAL INFORMATION

General information regarding the geology, hydrogeology, and hydrology of the Leesburg ASC presented below was obtained from the Leesburg ASC 2010 HRR, except where noted. At the time of this SI, the ASR and PA were not complete for the Leesburg ASC FUDS. Regional information is followed by a discussion of MRS-specific

characteristics, QR, sampling locations, and results (Figure 5.1) for the MRSs investigated as part of the SI.

### 5.2.1 Regional Geologic Setting

5.2.1.1 The Leesburg ASC is located in the Sumter Upland and Lake Harris Cross Valley Physiographic Provinces. These provinces contain uplands, ridges, and valleys. The topography in the area is characterized by karst features, such as sinkholes, springs, and caves, and the level Wicomico marine terrace. The Wicomico marine terrace is widespread along the central spine of the Floridian peninsula and is characterized by elevations ranging from 70 – 100 feet above msl.

5.2.1.2 The surficial sediments in this portion of Sumter County are Holocene-aged quartz sands with varying amounts of silt and clay, carbonate sands and muds, and organics. The thickness of these surficial sands range from 40 to 70 feet near the Leesburg ASC. The majority of the areal extents of the Leesburg ASC MRSs are underlain by Holocene sediments (FGS, 2001).

5.2.1.3 Underlying the Holocene sediments may be a thin layer of the Cypresshead Formation and a relatively thin (less than 30 feet thick) zone of undifferentiated Hawthorn Group sediments. The Pliocene aged Cypresshead Formation consists of reddish brown, unconsolidated, fine to very coarse, clean to clayey sands and is exposed at elevations above 100 feet above msl (FGS, 2001). The Miocene-aged Hawthorn Group sediments are composed of siliciclastics and relatively finer-grained sediments such as fine sands, clayey sands, sandy clays, and clay.

5.2.1.4 Underlying the Hawthorn group sediments is the Eocene-aged Ocala Limestone. Rocks of the Ocala Limestone are typically white-cream to tan-gray, soft to hard, granular, porous marine limestone, and occasional dolostones. The Eocene-aged Avon Park Formation underlies the Ocala Limestone. Lithologically, the Avon Park Formation consists of layers of cream to light brown or tan, poorly indurate to well indurated, variably fossiliferous, limestone. The limestones are interbedded with tan to brown, fossiliferous dolostones (FGS, 2001).

5.2.1.5 The soils near the MRS sampling locations include the Delray fine sand, EauGallie fine sand, Smyrna fine sand, and the Okeelanta muck. The fine sands are typically deep, poorly or very poorly drained, with rapid permeability in the upper horizons. Typically, the fine sands are found in broad flats, flood plains, and depressions. In general, the water table is at depths of less than 18 inches for 1 to 4 months in most years and between 12 and 40 inches for 3 to 6 months. In rainy seasons, the water table rises above the surface briefly. The Okeelanta series consists of very deep, very poorly drained, rapidly permeable soils in large fresh water marshes and small depressional areas. The upper 40 inches are predominantly organic material and is underlain with sand. In undrained areas, the water table is at depths of less than 10 inches below the surface or the soil is covered by water 6 to 12 months during most years (Web Soil Survey, 2010).

### 5.2.2 Regional Hydrogeologic Setting

5.2.2.1 Groundwater in Sumter County occurs under both unconfined and confined conditions. The surficial aquifer occurs within the Holocene-aged unconsolidated sands and possibly the underlying Cypresshead Formation. The base of the aquifer consists of the relatively finer-grained sediments of the undifferentiated Hawthorn Group. The thickness of the surficial aquifer is variable depending on the thickness of the sands, but in the study area it is approximately 50 feet thick (base at approximately 25 feet msl) based on the interpretation of nearby well logs (FDEP, 2008a). Recharge to the surficial aquifer is almost entirely from rainfall. The surficial aquifer could be a source for very small domestic water supplies.

5.2.2.2 A thin intermediate aquifer may underlie the surficial aquifer in the study area. The intermediate aquifer would consist of the more permeable layers within the undifferentiated Hawthorn Group sediments. In the study area, the Floridan Aquifer most likely directly underlies the surficial aquifer, in which case it would be in an unconfined condition. The framework of the Floridan aquifer is composed of the carbonate rocks of the Ocala Limestone and the underlying Avon Park Formation. The surface of the Floridan Aquifer in the study area is at an elevation of approximately zero feet msl. Near the FUDS, the thickness of the Ocala Limestone ranges from 50-100 feet thick. The surface of the Avon Park Formation is at approximately -100 feet msl (FDEP, 2008a).

### 5.2.3 Regional Groundwater Use

5.2.3.1 Groundwater is the primary source of drinking water for the city of Wildwood. According to the 2009 Annual Drinking Water Quality Report, the city of Wildwood derives groundwater from 7 wells completed in the Floridan Aquifer. The water is treated before distribution via chlorination, aeration, and additives such as polyphosphates (for iron) (City of Wildwood, 2011)

5.2.3.2 Well information was obtained from Southwest Florida Water Management District (SWFWMD), St. Johns River Water Management District (SJRWMD), and the FDEP. Table 5.1 lists the registered groundwater wells within 4 miles of the MRSs at the Leesburg ASC. There are 308 reported groundwater wells within a 4-mile radius of the MRS01 – 300 Yard Known Distance Rifle Range; none are reportedly within the MRS boundary. There are 233 reported groundwater wells within a 4-mile radius of the MRS02 – Hand Grenade Court; none are reportedly within the MRS boundary (Figure 5.2). According to the well report (Appendix L), the active groundwater wells within 4 miles of the MRSs at the Leesburg ASC have drilled depths reaching to 555 feet. Information regarding the specific type and use for each water well is listed in the well report located in Appendix L.

**Table 5.1**
**Registered Groundwater Wells within a**
**4-Mile Radius of the MRSs at Leesburg ASC**
**Sumter County, Florida**

| MRS | On-Site | 0 to 1/4 Mile | 1/4 to 1/2 Mile | 1/2 to 1 Mile | 1 to 2 Miles | 2 to 3 Miles | 3 to 4 Miles | Total |
|---|---|---|---|---|---|---|---|---|
| MRS01-300 Yard Known Distance Rifle Range | 0 | 3 | 2 | 8 | 38 | 74 | 183 | 308 |
| MRS02-Hand Grenade Court | 0 | 0 | 3 | 3 | 25 | 30 | 172 | 233 |

### 5.2.4 Regional Hydrologic Setting

The area surrounding the MRSs is essentially flat with elevations ranging from about 65 to 70 feet above msl. Surface water from precipitation events will tend to pond in depressional areas and remain at the surface for long periods. Drainage near the MRSs is to the southeast towards the large swampy area located in the southeastern portion of the FUDS. Eventually surface water may discharge into Lake Denham.

### 5.2.5 Regional Sensitive Ecological Resources

5.2.5.1 According to the USFWS Threatened and Endangered (T&E) Species System database, the state of Florida supports 115 federally listed T&E species consisting of 60 animals and 55 plants (USFWS, 2011b). The USFWS North Florida Ecological Services Office indicates there are five T&E species occurring within Sumter County (USFWS, 2010); a small portion of the FUDS and the MRS01- 300 Yard Known Distance Rifle Range overlaps Lake County, but for the purpose of this analysis, only the species listed for Sumter County are analyzed. The T&E species listed for Sumter County are the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida scrub-jay (*Aphelocoma coeruluscens*), wood stork (*Mycteria americana*), red-cockaded woodpecker (*Picoides borealis*), and the eastern indigo snake (*Dymarchon corais couperi*). Thirty-two state listed endangered, threatened, or species of special concern occur in Sumter County (FNAI, 2010).

5.2.5.2 Approximately a quarter of the FUDS property is utilized for residential purposes, orange groves, a public park, and a boat ramp. The remainder of the FUDS property is timberland or unimproved. There are many lakes surrounding the FUDS and the property contains many wetland areas. The MRSs contains large areas of wooded wetlands and open pastureland (Natural Resources Conservation Service [NRCS], 2011).

5.2.5.3 The Everglade snail kite historically occurred in Sumter County but is now limited to habitats and watersheds south of the site. Additionally, the Florida Natural Areas Inventory does not identify the kite as occurring in Sumter County (FNAI, 2010); therefore, the Everglade snail kite would not occur within the Leesburg ASC FUDS property. The Florida scrub jay occurs in Sumter County but its range does not overlap the FUDS; it is not likely to occur at the site (NatureServe, 2010). The red-cockaded woodpecker inhabits longleaf pine flatwoods in north-central Florida, preferring mature pine woodlands. It is unclear if the wooded portions of the MRSs are pine woodlands, but given the general forest fragmentation of the area around the site, it is unlikely that it is mature forest; therefore, the woodpecker is unlikely to occur at the site (FNAI, 2001).

5.2.5.4 Two species are likely to or may potentially occur at the Leesburg ASC: the wood stork and the eastern indigo snake. The wood stork nests in a variety of inundated forest wetlands and increasingly in artificial habitats. They forage mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches, where they are attracted to falling water levels that concentrate food sources (mainly fish) (FNAI, 2001). The MRS01- 300 Yard Known Distance Rifle Range and the MRS02- Hand Grenade Court contain large areas of wooded wetlands and the wood stork range overlaps the site (NatureServe, 2010); therefore, the stork may potentially occur at the site. The eastern indigo snake inhabits a broad range of habitats, from scrub and sandhill to wet prairies and mangrove swamps. The Leesburg ASC FUDS property is within the range of the snake and contains wooded areas, pastureland, and wetland areas that may combine to provide suitable habitat (FNAI, 2001). Based on the habitat within the MRSs and the known range of the snake, there is a high potential for the snake to occur within the MRS boundaries. The wood stork and the eastern indigo snake are detailed further in Table 5.2.

5.2.5.5 No additional information on the occurrence of T&E species or natural communities is known at this time. Due to the non-intrusive nature of the SI field effort, no federally listed T&E species were impacted by the SI field effort.

5.2.5.6 Parsons ensured that the SVT was versed in identifying and avoiding any sensitive species and provided species awareness training in the daily tailgate safety meetings. If any T&E species were observed, care was taken to not disturb them or their immediate habitat. The SVT did not observe any listed species during the fieldwork.

5.2.5.7 The USFWS Wetlands Mapper, through the National Wetlands Inventory, was used to identify wetlands within the Leesburg ASC FUDS property (USFWS, 2011c). Wetlands are land areas that are transitional between terrestrial and deep-water habitats in which the water table usually is at or near the surface or in which the land is covered by shallow water. There are numerous wetlands throughout the FUDS and MRSs. The MRSs contain predominantly palustrine wetlands with various subsystems, classes, and subclasses; most of the wetlands at the site are temporarily, seasonally, or semipermanently flooded (Figure 5.3). According to the National Wetland Inventory, the primary wetland classes located within the MRSs are:

- PFO - Palustrine, forested
- PEM - Palustrine, emergent
- PSS - Palustrine, scrub-shrub

5.2.5.8 The Wetlands Mapper is used primarily for planning and does not accurately indicate jurisdictional limits of wetlands that are Waters of the United States. Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies.

5.2.5.9 Other wetlands not identified by the Wetland Mapper may be on the site. If additional wetlands were within the sampling area, they were avoided if possible. However, the shallow sampling method and QR track planned did not have negative impacts to any wetland nor warrant mitigation. A formal wetland delineation was not performed by the SVT.

5.2.5.10 Using the criteria in the Army Checklist for Important Ecological Places (USACE, 2006b) the FUDS, MRS01- 300 Yard Known Distance Rifle Range, and MRS02- Hand Grenade Court are important ecological places since they support wetland areas (Figure 5.3) and have potential T&E species and supporting habitat. Therefore, ecological receptors are assumed present at this site and a Screening Level Ecological Risk Assessment (SLERA) was conducted. The QR and SI field efforts were performed to minimize any intrusion in sensitive areas.

**TABLE 5.2**
**POTENTIAL STATE-LISTED AND FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES**
**LEESBURG ASC, SUMTER COUNTY, FLORIDA**

| Common Name | Scientific Name | Federal Status | State Status | Preferred Habitat | Habitat Present on-site? |
|---|---|---|---|---|---|
| Wood Stork   | *Mycteria americana* | Endangered | Endangered | Chiefly freshwater situations: marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands. Nests mostly in upper parts of cypress trees, mangroves, or dead hardwoods over water or on islands along streams or adjacent to shallow lakes. Feeds in freshwater marshes, swamps, lagoons, ponds, flooded pastures and flooded ditches, depressions in marshes (especially during drought) (USFWS, 1999). | Yes |

**TABLE 5.2**
**POTENTIAL STATE-LISTED AND FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES**
**LEESBURG ASC, SUMTER COUNTY, FLORIDA**

| Common Name | Scientific Name | Federal Status | State Status | Preferred Habitat | Habitat Present on-site? |
|---|---|---|---|---|---|
| Eastern indigo snake  | *Dymarchon corais couperi* | Threatened | Threatened | Habitat includes sandhill regions dominated by mature longleaf pines, turkey oaks, and wiregrass; flatwoods; most types of hammocks; coastal scrub; dry glades; palmetto flats; prairie; brushy riparian and canal corridors; and wet fields. Occupied sites are often near wetlands and frequently are in association with gopher tortoise burrows (USFWS, 1999). | Yes |

### 5.2.6 Sample Locations/Methods

5.2.6.1 The fieldwork for the Leesburg ASC FUDS was conducted on August 24, 2011, and included QR and MC sampling. No intrusive MEC investigations, explosives handling, or MEC detonations were conducted.

5.2.6.2 Soil: Sixteen surface soil samples were collected from site locations selected with maximum bias for the presence of MC contamination within the MRSs at the Leesburg ASC. The twelve biased surface soil sample identifications for MRS01- 300 Yard Known Distance Rifle Range are listed as LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-12. The four biased surface soil samples for MRS02- Hand Grenade Court are listed as LASC-MRS02-SS-02-13 through LASC-MRS02-SS-02-16. Two field duplicate samples were also collected and are not included in the above counts. All of the biased samples are located within the MRSs at the site. Three surface soil samples were collected from areas outside the MRSs but inside the FUDS boundary to reflect ambient metals concentrations in surface soil in the site area. The data from these ambient samples are used only in the MRSPP evaluation. The ambient sample identifications are as follows: LASC-AMB-SS-02-17, LASC-AMB-SS-02-18, and LASC-AMB-SS-02-19. QC samples were also collected from the site.

5.2.6.3 Surface water/Sediment: No surface water or sediment samples were collected during the SI because no surface water sources were available at that time.

5.2.6.4 Groundwater: Per TPP Team concurrence, groundwater samples were not proposed for the Leesburg ASC SI based on the following:

- There are no recorded wells within the MRSs; therefore, the exposure pathway would be incomplete;
- Three groundwater wells are present within the FUDS (extreme northwest corner). These wells have reported depths of 120, 338, and 1,000 feet below land surface and draw from the Upper Floridan aquifer. These depths make leaching to these wells unlikely, and;
- No MEC/MD or range remnants were found during previous investigations or during the SI making it unlikely that a contamination source remains on-site.

5.2.6.5 The biased soil samples LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-04 located at the firing points in MRS01- 300 Yard Known Distance Rifle Range were analyzed for explosives. The remaining biased soil samples (LASC-MRS01-SS-02-05 through LASC-MRS01-SS-02-12) within the MRS01- 300 Yard Known Distance Rifle Range were analyzed for select metals (antimony, copper, and lead). The biased surface soil samples collected from the MRS02- Hand Grenade Court were analyzed for explosives and select metals (iron and zinc). Additionally, the ambient samples collected outside of the MRSs were analyzed for antimony, copper, iron, lead, and zinc. These ambient samples were collected to provide information only and to assist in the MRSPP scoring. The ambient sample data was not used for comparison (Subchapter 5.2.7) to biased sample data.

5.2.6.6 Preliminary sample locations were identified before the SI team arrived on site and were approved by the Unexploded Ordnance (UXO) technician prior to final

location selection and sample collection. For safety reasons, the UXO technician used a Schonstedt magnetometer for anomaly avoidance during the collection of the samples. The sample locations were recorded using the GPS unit.

5.2.6.7 The collected samples were packaged and shipped to APPL for analysis. APPL is accredited under the state of Florida acceding authority for the National Environmental Laboratory Accreditation Program (NELAP) and is certified by the Environmental Laboratory Accreditation Program (ELAP). The laboratory submitted the chemical data under Sample Delivery Group (SDG) numbers 65502 to Parsons. The data are presented in Appendix F. Parsons validated and assessed the data in accordance with the guidelines outlined in the PSAP (consisting of the Field Sampling Plan and the Quality Assurance Project Plan) for the MMRP SI Program, prepared by the USACE Military Munitions Center of Expertise and PSAP Addendum, prepared by Parsons. The data validation indicates that the laboratory correctly performed the analyses and that no data were rejected. The data validation summary reports are presented in Appendix G and the sample results are presented in Table 5.3.

5.2.6.8 The original PSAP indicated the laboratory used for this site would be TestAmerica-Denver. However, approval was received from USACE to use APPL as the laboratory for this site on July 25, 2011. All other sample collection procedures presented in the Final PSAP (USACE, 2005) and the Parsons Final PSAP Addendum (Parsons, 2006) were followed.

5.2.6.9 As indicated in the SS-WP Addendum (Parsons, 2011), values detected in the range between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) were reported as “estimated” values (J-flagged) and were used for risk screening evaluations. Any U-flagged value is treated as “not detected,” and is assumed not present in the sample. In some cases, the PQL is greater than the screening value. This is common in some analyses due to sample preparation and analytical limitations. This could lead to a situation where the analyte is present at a concentration greater than the screening value, but is reported as "not detected or estimated" leading to an underestimate of risk. However, based on the extensive data collected for the FUDS SI program, such occasions are expected to be rare and are not likely to drive the recommendation for the SI.

## Table 5.3
## SUMMARY OF VALIDATED ANALYTICAL RESULTS FOR LEESBURG AIR SERVICE CENTER MMRP SOIL SAMPLES COLLECTED IN AUGUST 2011

| SAMPLE ID: | | LASC-AMB-SS-02-17* | | LASC-AMB-SS-02-18* | | LASC-AMB-SS-02-19* | | LASC-MRS01-SS-02-01 | | LASC-MRS01-SS-02-02 | | LASC-MRS01-SS-02-03 | | LASC-MRS01-SS-02-04 | | LASC-MRS01-SS-02-05 | | LASC-MRS01-SS-02-20** | | LASC-MRS01-SS-02-06 | | LASC-MRS01-SS-02-07 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE SAMPLED: | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | |
| LAB SAMPLE ID: | | AY45253 | | AY45254 | | AY45252 | | AY45234 | | AY45235 | | AY45237 | | AY45236 | | AY45243 | | AY45244 | | AY45245 | | AY45246 | |
| | Units | | | | | | | | | | | | | | | | | | | | | | |
| **Explosives - SW8330B** | | | | | | | | | | | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | mg/kg | | | | | | | 0.09 | U | 0.09 | U | 0.09 | U | 0.09 | U | | | | | | | | |
| 1,3-Dinitrobenzene | mg/kg | | | | | | | 0.40 | U | 0.40 | U | 0.40 | U | 0.40 | U | | | | | | | | |
| 2,4,6-Trinitrotoluene (TNT) | mg/kg | | | | | | | 0.30 | U | 0.30 | U | 0.30 | U | 0.30 | U | | | | | | | | |
| 2,4-Dinitrotoluene | mg/kg | | | | | | | 0.07 | U | 0.07 | U | 0.07 | U | 0.07 | U | | | | | | | | |
| 2,6-Dinitrotoluene | mg/kg | | | | | | | 0.04 | U | 0.04 | U | 0.04 | U | 0.04 | U | | | | | | | | |
| 2-Amino-4,6-dinitrotoluene | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| 2-Nitrotoluene | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| 3-Nitrotoluene | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| 4-Amino-2,6-dinitrotoluene | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| 4-Nitrotoluene | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| Methyl-2,4,6-trinitrophenylnitramine (Tetryl) | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| Nitrobenzene | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| Nitroglycerin | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | mg/kg | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | | | | | | | | |
| Pentaerythritol Tetranitrate (PETN) | mg/kg | | | | | | | 2.5 | U | 2.5 | U | 2.5 | U | 2.5 | U | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| **Metals - SW6010B** | | | | | | | | | | | | | | | | | | | | | | | |
| Antimony | mg/kg | 0.20 | U | 0.21 | U | 0.21 | U | | | | | | | | | **0.37** | | **0.23** | | 0.24 | UJ | **0.081** | J |
| Copper | mg/kg | **1.3** | | **2.3** | | **1.3** | | | | | | | | | | **4.1** | | **3.4** | | **2.9** | | **2.4** | |
| Iron | mg/kg | **760** | | **100** | | **970** | | | | | | | | | | | | | | | | | |
| Lead | mg/kg | **2.8** | | **3.0** | | **5.6** | | | | | | | | | | **30** | | **22** | | **5.2** | | **16** | |
| Zinc | mg/kg | **7.8** | | **6.3** | | **16** | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| **Percent Moisture** | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture, percent | % | 2.0 | U | **4.3** | | **5.8** | | | | | | | | | | **14** | | **14** | | **16** | | **11** | |

NO CODE) - Confirmed identification.
U - Analyte was analyzed for but not detected above the sample specific practical quantitation limit (PQL_sa).
UJ - Analyte not detected, reported PQL_sa may be inaccurate or imprecise.
J - Analyte detected, estimated concentration.
* - Ambient sample.
** - Field duplicate of sample on left.
Detections are bolded.

## Table 5.3
## SUMMARY OF VALIDATED ANALYTICAL RESULTS FOR LEESBURG AIR SERVICE CENTER MMRP SOIL SAMPLES COLLECTED IN AUGUST 2011

| SAMPLE ID: | | LASC-MRS01-SS-02-08 | | LASC-MRS01-SS-02-09 | | LASC-MRS01-SS-02-10 | | LASC-MRS01-SS-02-11 | | LASC-MRS01-SS-02-12 | | LASC-MRS02-SS-02-13 | | LASC-MRS02-SS-02-14 | | LASC-MRS02-SS-02-21** | | LASC-MRS02-SS-02-15 | | LASC-MRS02-SS-02-16 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE SAMPLED: | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | | 08/24/11 | |
| LAB SAMPLE ID: | | AY45247 | | AY45248 | | AY45249 | | AY45250 | | AY45251 | | AY45240 | | AY45241 | | AY45242 | | AY45239 | | AY45238 | |
| | Units | | | | | | | | | | | | | | | | | | | | |
| **Explosives - SW8330B** | | | | | | | | | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | mg/kg | | | | | | | | | | | 0.090 | U | 0.090 | U | 0.090 | U | 0.090 | U | 0.090 | U |
| 1,3-Dinitrobenzene | mg/kg | | | | | | | | | | | 0.40 | U | 0.40 | U | 0.40 | U | 0.40 | U | 0.40 | U |
| 2,4,6-Trinitrotoluene (TNT) | mg/kg | | | | | | | | | | | 0.30 | U | 0.30 | U | 0.30 | U | 0.30 | U | 0.30 | U |
| 2,4-Dinitrotoluene | mg/kg | | | | | | | | | | | 0.070 | U | 0.070 | U | 0.070 | U | 0.070 | U | 0.070 | U |
| 2,6-Dinitrotoluene | mg/kg | | | | | | | | | | | 0.040 | U | 0.040 | U | 0.040 | U | 0.040 | U | 0.040 | U |
| 2-Amino-4,6-dinitrotoluene | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| 2-Nitrotoluene | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| 3-Nitrotoluene | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| 4-Amino-2,6-dinitrotoluene | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| 4-Nitrotoluene | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| Methyl-2,4,6-trinitrophenylnitramine (Tetryl) | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| Nitrobenzene | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| Nitroglycerin | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | mg/kg | | | | | | | | | | | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U | 0.50 | U |
| Pentaerythritol Tetranitrate (PETN) | mg/kg | | | | | | | | | | | 2.5 | U | 2.5 | U | 2.5 | U | 2.5 | U | 2.5 | U |
| | | | | | | | | | | | | | | | | | | | | | |
| **Metals - SW6010B** | | | | | | | | | | | | | | | | | | | | | |
| Antimony | mg/kg | 0.22 | U | 0.22 | U | 0.22 | U | **0.16** | J | 0.22 | U | | | | | | | | | | |
| Copper | mg/kg | **0.77** | | **1.4** | | **0.68** | | **1.6** | | **1.4** | | | | | | | | | | | |
| Iron | mg/kg | | | | | | | | | | | **270** | J | **100** | | **85** | | **160** | | **190** | |
| Lead | mg/kg | **2.4** | | **10** | | **1.6** | | **9.6** | | **4.8** | | | | | | | | | | | |
| Zinc | mg/kg | | | | | | | | | | | **11** | J | **12** | | **9.9** | | **5.8** | | **7.2** | |
| | | | | | | | | | | | | | | | | | | | | | |
| **Percent Moisture** | | | | | | | | | | | | | | | | | | | | | |
| Moisture, percent | % | **8.8** | | **7.2** | | **9.7** | | **27** | | **10** | | **3.3** | | **2.2** | | **2.4** | | **7.9** | | **2.1** | |

(NO CODE) - Confirmed identification.
U - Analyte was analyzed for but not detected above the sample specific practical quantitation limit (PQL_sa).
UJ - Analyte not detected, reported PQL_sa may be inaccurate or imprecise.
J - Analyte detected, estimated concentration.
* - Ambient sample.
** - Field duplicate of sample on left.
Detections are bolded.

### 5.2.7 Ambient Concentrations

5.2.7.1 Parsons did not collect "background" samples, but rather "ambient" samples to provide separation from the statistical-based and baseline risk assessment connotation. For the Leesburg ASC site, no ambient surface water or sediment samples were collected due to the absence of an appropriate sampling location. Three ambient surface soil samples (LASC-AMB-SS-02-17 through LASC-AMB-SS-02-19) as shown on Figure 5.1, were collected during the SI at locations that were selected to be in the least likely MEC or MC-contaminated area and, therefore, potentially provide ambient condition data concerning metals concentrations at the site. No MEC or MD was observed near the ambient sample locations, which suggests that these samples are likely representative of the naturally occurring surface soil in the area. The results for these ambient surface soil samples are provided in Tables 5.3.

5.2.7.2 The TPP Team agreed, at the request of FDEP, that any of the selected MC detected in the biased samples would be compared directly to the relevant FDEP-approved risk screening values without comparison against the ambient sample data for source screening prior to the SLRA. Simply stated, the analytes that are potential MC and are detected in the biased samples will be retained for consideration in the SLRA (Chapter 6). However, the ambient sample data will be used in the MRSPP scoring.

### 5.2.8 Munitions Constituents Source Evaluation

As explained earlier in Subchapter 5.1, an exposure pathway is not complete unless MC have been released at the site. To make this determination, analytical results for MC are evaluated using several criteria to determine whether MC have been released to environmental media. MC that are detected in the sample medium may have been released due to munitions-related activities. Any detection of MC in the surface soil at the MRSs is considered a potential release and is evaluated further in the SLRA (Chapter 6).

## 5.3 MRS01 – 300 YARD KNOWN DISTANCE RIFLE RANGE

This subchapter of the SI Report evaluates exposure pathways for the MRS01– 300 Yard Known Distance Rifle Range. The setting of the overall site is described in Subchapters 5.2.1 and 5.2.2. The analysis of each pathway (groundwater, surface water/sediment, soil, and air) is described in detail. The related CSEM for this MRS is provided in Appendix J.

### 5.3.1 Historical Munitions Constituents Information

Prior to this SI, no data existed to indicate that MC related to munitions used at the site affected the MRS. No historical MC-related groundwater, surface water, soil, sediment, or air sampling has been documented at the MRS01– 300 Yard Known Distance Rifle Range.

### 5.3.2 Groundwater Exposure Pathway

Groundwater can serve as a contaminant transport mechanism that may affect surface water bodies, sediment, drinking water supplies, vegetation, and sensitive

environments such as wetlands. The likelihood of exposure because of leaching is influenced by such factors as the mass and concentration of MC in soil at the ground surface that can be transported to the groundwater, site-specific geology, climate, and the expected future land use.

#### 5.3.2.1 Geologic and Hydrogeologic Setting

There are no known differences between the geologic and hydrogeologic setting at the MRS01– 300 Yard Known Distance Rifle Range and the setting described for the overall range in subchapter 5.2. There are no known wells inside the MRS boundary (Figure 5.2).

#### 5.3.2.2 Releases and Potential Releases to Groundwater

Prior to the SI, there were no known releases of MC to groundwater at the MRS01– 300 Yard Known Distance Rifle Range. Based on the type of munitions activities conducted at the site, it is unlikely that groundwater would have been directly affected. Contaminant leaching from the surface soil to groundwater is possible at this MRS. If there were releases of MC to soil because of the munitions-related activities, it is possible that the constituents could leach to groundwater at the MRS01– 300 Yard Known Distance Rifle Range.

#### 5.3.2.3 Groundwater Exposure Pathways and Receptors

Currently, this MRS is owned by a private corporation. The MRS01- 300 Yard Known Distance Rifle Range is currently timberland/wetlands and unimproved, with some pastures being used for cattle. The former rifle range appears to be overgrown with vegetation and mostly undeveloped. County Road 468 now traverses part of the former 300-yard firing line. Power lines traverse the property from east/northeast to west/southwest passing through the approximate target area (USACE, 2010). A large residential development, named Southern Oaks, is planned for the southern portion of the FUDS and the MRS01- 300 Yard Known Distance Rifle Range. Based on the current and future land use of the MRS01– 300 Yard Known Distance Rifle Range, potential receptors in this MRS include future residents, visitors/recreational users and commercial/industrial workers. Human receptors are potentially exposed to groundwater through ingestion as drinking water, incidental ingestion, and dermal contact. Groundwater is not directly accessible to most ecological receptors, so this pathway is not present at this MRS. Groundwater would not have been directly affected by munitions-related activities at this MRS.

#### 5.3.2.4 Groundwater Sample Locations and Methods

No groundwater wells are reportedly located within the MRS, therefore no groundwater samples were collected during the SI at the MRS01– 300 Yard Known Distance Rifle Range.

#### 5.3.2.5 Groundwater Analytical Results

Not applicable. Groundwater samples were not collected at the MRS01– 300 Yard Known Distance Rifle Range.

#### 5.3.2.6 Groundwater Exposure Pathway Conclusions

Based on the absence of groundwater wells within the MRS01- 300 Yard Known Distance Rifle Range, it is unlikely that future residents, visitors/recreational users or commercial/ industrial workers would be exposed to MC that could potentially have leached from the soil into the groundwater, as discussed under Subchapter 5.2.6.4. There are no groundwater wells within the MRS; therefore, the groundwater exposure pathway is incomplete for all receptors.

### 5.3.3 Surface Water and Sediment Exposure Pathways

Surface water can serve as a contaminant transport mechanism that may affect surface water bodies, sediment, drinking water supplies, vegetation, and sensitive environments such as wetlands. The likelihood of exposure is influenced by such factors as the mass and concentration of MC in soil at the ground surface that can be transported to the surface water and sediment through runoff and erosion.

#### 5.3.3.1 Hydrologic Setting

There are no known differences between the hydrologic setting for the MRS01- 300 Yard Known Distance Rifle Range and the regional setting described in subchapter 5.2.4. No surface water was observed near the sampling areas during the SI.

#### 5.3.3.2 Releases and Potential Releases to Surface Water and Sediment

Based on the munitions used (small arms) at the MRS and former target locations, direct releases of MC to wetlands and to surface water was possible at the MRS01- 300 Yard Known Distance Rifle Range.

#### 5.3.3.3 Surface Water and Sediment Exposure Pathways and Receptors

The surface water exposure pathways account for the potential threat to human and ecological receptors on or near the MRS01- 300 Yard Known Distance Rifle Range who may be exposed to MC in surface water. Based on the current and future land use of this MRS, potential receptors include future residents, visitors/recreational users, commercial/industrial workers, and ecological receptors. When surface water is present, these receptors may be exposed to MC in surface water or sediment via incidental ingestion or dermal exposure. The drinking water exposure pathway is not present for humans as the surface water is not used as a drinking water source. Ecological receptors could be exposed to MC in surface water through ingestion as a drinking water source. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with the surface water or sediment. However, at the time of the site visit, surface water was not present within the MRS01- 300 Yard Known Distance Rifle Range.

#### 5.3.3.4 Surface Water and Sediment Sample Locations and Methods

At the time of the field investigation for the Leesburg ASC FUDS, no surface water was observed near the sampling areas within the MRS01- 300 Yard Known Distance Rifle Range. Due to the lack of an appropriate surface water source, no surface water/sediment samples were collected from this MRS.

#### 5.3.3.5 Surface Water and Sediment Analytical Results

Not applicable. Surface water/sediment samples were not collected at the MRS01- 300 Yard Known Distance Rifle Range.

#### 5.3.3.6 Surface Water and Sediment Exposure Pathway Conclusions

Based on the current and future land use of this MRS, potential receptors include future residents, visitors/recreational users, commercial/industrial workers, and ecological receptors. The drinking water exposure pathway is not complete for humans as the surface water is not used as a drinking water source but is complete for ecological receptors. Human receptors could be exposed to MC in the surface water/sediment through incidental ingestion and dermal contact and these pathways are potentially complete, but not quantitatively assessed because surface water and sediment were not sampled. Ecological receptors could be exposed to MC in surface water and sediment through ingestion as drinking water, incidental ingestion, and dermal contact. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with surface water or sediment. These exposure pathways are also potentially complete, but not quantitatively assessed because surface water and sediment were not sampled.

### 5.3.4 Soil Exposure Pathway

Potential soil exposure pathways include incidental ingestion, dermal contact, and inhalation of resuspended particulates by human and ecological receptors, as well as leaching to groundwater and runoff and erosion to surface water and sediment. The likelihood of exposure is influenced by such factors as the mass and concentration of MC in the soil exposed at the ground surface, site-specific geology, climate, and expected future land use.

#### 5.3.4.1 Physical Source Access Conditions

The MRS01- 300 Yard Known Distance Rifle Range is currently timberland/wetlands and unimproved land, with some pastures used for cattle. The former rifle range appears to be overgrown with vegetation and mostly undeveloped. County Road 468 now traverses part of the former 300-yard firing line. Power lines traverse the property from east/northeast to west/southwest passing through the approximate target area (USACE, 2010). Safety fan portions of the MRS are open lands, agricultural, and forested/wetland areas. A large residential development, named Southern Oaks, is planned for the southern portion of the FUDS and the MRS01- 300 Yard Known Distance Rifle Range. There are no known physical restrictions to access.

#### 5.3.4.2 Actual or Potential Contamination Areas

Prior to the SI, there were no known contamination areas within MRS01- 300 Yard Known Distance Rifle Range. The location of the rifle range was confirmed through historical documentation and included 15 targets with 100-, 200-, and 300-yard firing points. During the SI, a berm approximately 10 feet high and 400 feet in length was observed by the SVT. Conventional ordnance firing activities occurred at the rifle range and included small arms (rifle and pistol). The potential munitions used at the MRS01- 300 Yard Known Distance Rifle Range consist of .22 Caliber, .30 Caliber, .38 Caliber

and .45 Caliber small arms munitions. No MEC or MD were found during previous site investigations or during the QR for this SI.

#### 5.3.4.3 Soil Exposure Pathways and Receptors

The soil exposure pathway accounts for the potential risk to human and ecological receptors on the MRS01- 300 Yard Known Distance Rifle Range that may come in contact with potentially contaminated soil. Based on the current and future land use of this MRS, potential receptors include future residents, visitors/recreational users, commercial/industrial workers, and ecological receptors. These receptors may be exposed to MC in surface soil via dermal contact, incidental ingestion, or inhalation of resuspended soil particulates. The inhalation pathway is evaluated in Subchapter 5.3.5 Air Exposure Pathway. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with soil.

#### 5.3.4.4 Soil Sample Locations and Methods

Twelve biased surface soil samples (LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-12) and one field duplicate sample (LASC-MRS01-SS-02-20) were collected from locations within the MRS01- 300 Yard Known Distance Rifle Range (Figure 5.1). Four samples collected from the firing points were analyzed for explosives. Select metals antimony, copper, and lead were analyzed for the eight samples collected near the target berm. Figure 5.1 shows the actual QR paths and sample locations for the August 2011 site visit. Sampling methods and analytical procedures are summarized in Subchapter 5.2.6. For a complete list of samples and corresponding analyses, see Table 3.1.

#### 5.3.4.5 Soil Analytical Results

The analytical results for the surface soil samples collected from the MRS01- 300 Yard Known Distance Rifle Range are presented in Table 5.3. These results were evaluated using the criteria described in Subchapter 5.2.8. As shown in Table 5.3, no explosives were detected in any of the samples. As shown in the Soil Source Evaluation in Table 5.4, MC metals antimony, copper, and lead were detected in surface soil samples collected from this MRS.

**Table 5.4**
**MRS01– 300 Yard Known Distance Rifle Range**
**Surface Soil Source Evaluation**
**Leesburg ASC, Sumter County, Florida**

| Analyte | Units | Maximum Detected Site Concentration | Potential MC? (1) | SLRA Required? (2) | Primary reason for exclusion from SLRA |
|---|---|---|---|---|---|
| ***Metals*** | | | | | |
| Antimony | mg/kg | 0.37 | **Yes** | **Yes** | -- |
| Copper | mg/kg | 4.1 | **Yes** | **Yes** | -- |
| Lead | mg/kg | 30 | **Yes** | **Yes** | -- |

**Notes:**
(1) Potential MC as listed in Table 4.1
(2) The TPP Team requested that all detected concentrations of MC be retained for evaluation in the SLRA.
mg/kg – milligrams per kilogram
**Data Qualifiers:**
(NO CODE) - Confirmed identification.

### 5.3.4.6 Soil Exposure Conclusions

Based on the current and future land use of this MRS, potential receptors include future residents, visitors/recreational users, commercial/industrial workers, and ecological receptors. These receptors may be exposed to MC in surface soil via dermal contact, incidental ingestion, or inhalation of resuspended soil particulates. Ecological receptors may also be exposed to MC through the ingestion of biota that have been in contact with the soil. These surface soil exposure pathways are complete for human and ecological receptors. No explosives were detected at this MRS. Antimony, copper, and lead were detected and are retained for further evaluation in the SLRA (Chapter 6).

## 5.3.5 Air Exposure Pathway

The air exposure pathway accounts for hazardous substance migration in gaseous or particulate form through the air. Airborne transport of contaminants can be an exposure pathway for human and ecological receptors. No air sampling has been performed at this site, and the TPP Team agreed that air sampling would not be performed as part of this SI.

### 5.3.5.1 Climate

The climate at the site is described in subchapter 2.2.3.

### 5.3.5.2 Releases and Potential Releases to Air

There are no known direct releases of MC to air at the MRS01- 300 Yard Known Distance Rifle Range and none of the potential MC are volatile. During dry and windy conditions, soil particulates can become airborne. If there were releases of MC to soil because of DoD munitions activities, it is possible that the constituents would migrate to

air via resuspension of soil particulates. The occurrence of windblown soil particulates may be expected at this site. As described in Subchapter 5.3.4.5, antimony, copper, and lead were detected in surface soil samples at this MRS indicating that MC contamination may be present and released to air. However, the human health screening values selected for use in this SI are protective of inhalation pathways.

#### 5.3.5.3 Air Exposure Pathway and Receptors

Based on the known current and future land use of the MRS01- 300 Yard Known Distance Rifle Range, potential receptors in this MRS include future residents, visitors/recreational users, commercial/industrial workers, and ecological receptors. Exposure would occur through inhalation of resuspended particulates.

#### 5.3.5.4 Air Sample/Monitoring Locations and Methods

No air sampling is known to have been previously performed at the MRS01- 300 Yard Known Distance Rifle Range and the TPP Team agreed that air sampling would not be conducted as part of this SI.

#### 5.3.5.5 Air Analytical Results

Not applicable.

#### 5.3.5.6 Air Exposure Pathway Conclusions

As discussed in Subchapter 5.3.4.5, three MC metals (antimony, copper, and lead) were detected in the surface soil samples. Based on these results, the air exposure pathway is complete for all receptors present at this MRS. The air exposure pathway for human receptors is assessed through the soil exposure pathway, as the human health screening values for soil include inhalation. The ecological screening values for soil do not evaluate this pathway, so the inhalation exposure pathway is potentially complete, but not quantitatively assessed, for ecological receptors.

## 5.4 MRS02 – HAND GRENADE COURT

This subchapter of the SI Report evaluates exposure pathways for the MRS02– Hand Grenade Court. The setting of the overall site is described in Subchapters 5.2.1 and 5.2.2. The analysis of each pathway (groundwater, surface water/sediment, soil, and air) is described in detail. The related CSEM for this MRS is provided in Appendix J.

### 5.4.1 Historical Munitions Constituents Information

Prior to this SI, no data existed to indicate that MC related to munitions used at the site affected the MRS. No historical MC-related groundwater, surface water, soil, sediment, or air sampling has been documented at the MRS02– Hand Grenade Court.

### 5.4.2 Groundwater Exposure Pathway

Groundwater can serve as a contaminant transport mechanism that may affect surface water bodies, sediment, drinking water supplies, vegetation, and sensitive environments such as wetlands. The likelihood of exposure because of leaching is influenced by such factors as the mass and concentration of MC in soil at the ground

surface that can be transported to the groundwater, site-specific geology, climate, and the expected future land use.

#### 5.4.2.1 Geologic and Hydrogeologic Setting

There are no known differences between the geologic and hydrogeologic setting at the MRS02 – Hand Grenade Court and the setting described for the overall FUDS in Subchapter 5.2. There are no known registered wells inside the MRS boundaries (Figure 5.2).

#### 5.4.2.2 Releases and Potential Releases to Groundwater

Prior to the SI, there were no known releases of MC to groundwater at the MRS02– Hand Grenade Court. Based on the type of munitions (HE) activities conducted at the site, it is possible that surficial groundwater could have been directly affected. In addition, contaminant leaching from the surface soil to groundwater is possible at this MRS. If there were releases of MC to soil because of the munitions-related activities, it is possible that the constituents could leach to groundwater at the MRS02– Hand Grenade Court.

#### 5.4.2.3 Groundwater Exposure Pathways and Receptors

The MRS02– Hand Grenade Court is currently owned by a private corporation. The MRS is undeveloped land, mostly pasture. Based on the current and future land use of the MRS02– Hand Grenade Court, potential receptors in this MRS include visitors/recreational users and commercial/industrial workers. Human receptors are potentially exposed to groundwater through ingestion as drinking water, incidental ingestion, and dermal contact. Groundwater is not directly accessible to most ecological receptors, so this pathway is not present at this MRS. Since there are no reported wells located within the MRS02– Hand Grenade Court, human receptors would not be exposed to groundwater and this pathway is incomplete.

#### 5.4.2.4 Groundwater Sample Locations and Methods

No groundwater samples were collected during the SI at the MRS02– Hand Grenade Court because there are no wells located within this MRS.

#### 5.4.2.5 Groundwater Analytical Results

Not applicable. Groundwater samples were not collected at the MRS02– Hand Grenade Court.

#### 5.4.2.6 Groundwater Exposure Pathway Conclusions

Based on the current and future uses of the MRS, potential receptors include visitors/recreational users and commercial/industrial workers. Because there are no reported wells located within the MRS02– Hand Grenade Court, human receptors would not be exposed to groundwater and this pathway is incomplete. Groundwater is not directly accessible to most ecological receptors so this pathway is also incomplete at this MRS.

### 5.4.3 Surface Water and Sediment Exposure Pathways

Surface water can serve as a contaminant transport mechanism that may affect surface water bodies, sediment, drinking water supplies, vegetation, and sensitive environments such as wetlands. The likelihood of exposure is influenced by such factors as the mass and concentration of MC in soil at the ground surface that can be transported to the surface water and sediment through runoff and erosion.

#### 5.4.3.1 Hydrologic Setting

There are no known differences between the hydrologic setting for the MRS02– Hand Grenade Court and the regional setting described in subchapter 5.2.4. As shown on Figure 5.1, there is no surface water on-site.

#### 5.4.3.2 Releases and Potential Releases to Surface Water and Sediment

There are no known releases of MC to surface water or sediment at the MRS02– Hand Grenade Court. Surface water and sediment would not have been directly affected by munitions activities at the site because there are no surface water sources within this MRS.

#### 5.4.3.3 Surface Water and Sediment Exposure Pathways and Receptors

The surface water exposure pathways account for the potential threat to human and ecological receptors on or near the MRS02– Hand Grenade Court who may be exposed to MC in surface water. Based on the current and future land use of the MRS02– Hand Grenade Court, potential receptors in this MRS include visitors/recreational users, commercial/industrial workers, and ecological receptors. Human receptors may be exposed to MC in surface water or sediment via incidental ingestion or dermal exposure. The drinking water exposure pathway is not present for humans as the surface water is not used as a drinking water source. Ecological receptors could be exposed to MC in surface water through ingestion as a drinking water source. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with the surface water or sediment. All surface water and sediment exposure pathways are incomplete because there is no surface water within this MRS.

#### 5.4.3.4 Surface Water and Sediment Sample Locations and Methods

The MRS02– Hand Grenade Court is currently a pasture. No water bodies were observed by the SVT during the field investigation. Therefore, no surface water/sediment samples were collected from this MRS.

#### 5.4.3.5 Surface Water and Sediment Analytical Results

Not applicable. Surface water /sediment samples were not collected at the MRS02– Hand Grenade Court.

#### 5.4.3.6 Surface Water and Sediment Exposure Pathway Conclusions

Based on the current and future land use of this MRS, potential receptors include visitors/recreational users, commercial/industrial workers, and ecological receptors. Because there is no surface water located within the MRS02– Hand Grenade Court,

receptors would not be exposed to surface water and all exposure pathways are incomplete.

### 5.4.4 Soil Exposure Pathway

Potential soil exposure pathways include incidental ingestion, dermal contact, and inhalation of resuspended particulates by human and ecological receptors, as well as leaching to groundwater and runoff and erosion to surface water and sediment. The likelihood of exposure is influenced by such factors as the mass and concentration of MC in soil exposed at the ground surface, site-specific geology, climate, and expected future land use.

#### 5.4.4.1 Physical Source Access Conditions

The MRS02– Hand Grenade Court is undeveloped land and currently used as pasture. The SVT saw no evidence of former military use. The property is fenced but there are no access restrictions to the MRS.

#### 5.4.4.2 Actual or Potential Contamination Areas

Prior to the SI, there were no known possible contamination areas within MRS02– Hand Grenade Court. Based on previous investigations, the MRS02– Hand Grenade Court was utilized for a hand grenade range. The potential munitions used at this MRS include practice and fragmentation (HE) hand grenades. No MEC, MD, or range remnants were found during previous site investigations or during the QR for this SI.

#### 5.4.4.3 Soil Exposure Pathways and Receptors

The soil exposure pathway accounts for the potential risk to human and ecological receptors on the MRS02– Hand Grenade Court that may come in contact with potentially contaminated soil. Based on the current and future land use of this MRS, potential receptors include visitors/recreational users, commercial/industrial workers, and ecological receptors. Typically, these receptors may be exposed to MC in surface soil via dermal contact, incidental ingestion, or inhalation of resuspended soil particulates. The inhalation pathway is evaluated in Subchapter 5.4.5. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with the soil.

#### 5.4.4.4 Soil Sample Locations and Methods

Four biased surface soil samples (LASC-MRS02-SS-02-13 through LASC-MRS02-SS-02-16) and one field duplicate sample (LASC-MRS02-SS-02-21) were collected from locations within the MRS02- Hand Grenade Court (Figure 5.1). The samples were analyzed for explosives and select metals (iron and zinc). Sampling methods and analytical procedures are summarized in Subchapter 5.2.6. For a complete list of samples and corresponding analyses, see Table 3.1.

#### 5.4.4.5 Soil Analytical Results

The analytical results for the surface soil samples collected from the MRS02- Hand Grenade Court are presented in Table 5.3. These results were evaluated using the criteria described in Subchapter 5.2.8. The surface soil source evaluations for metals are presented in Table 5.5. No explosives were detected at this MRS. As shown in Table 5.5, MC metals (iron and zinc) were detected.

**Table 5.5**
**MRS02– Hand Grenade Court**
**Surface Soil Source Evaluation**
**Leesburg ASC, Sumter County, Florida**

| Analyte | Units | Maximum Detected Site Concentration | Potential MC? (1) | SLRA Required? (2) | Primary reason for exclusion from SLRA |
|---|---|---|---|---|---|
| ***Metals*** | | | | | |
| Iron | mg/kg | 270 J | **Yes** | **Yes** | -- |
| Zinc | mg/kg | 12 | **Yes** | **Yes** | -- |
| | | | | | |

**Notes:**
(1) Potential MC as listed in Table 4.1
(2) The TPP Team requested that all detected concentrations of MC be retained for evaluation in the SLRA.
mg/kg – milligrams per kilogram
**Data Qualifiers:**
(NO CODE) - Confirmed identification.
J - Analyte detected, estimated concentration.

### 5.4.4.6 Soil Exposure Conclusions

Based on the current and future land use of this MRS, potential receptors include visitors/recreational users, commercial/industrial workers, and ecological receptors. These receptors may be exposed to MC via dermal contact, incidental ingestion, and inhalation of resuspended particulate matter. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with the soil. No explosives were detected. MC metals (iron and zinc) were detected and are retained for further evaluation in the SLRA (Chapter 6). Therefore, the human and ecological exposure pathways for soil are complete at the MRS02- Hand Grenade Court.

## 5.4.5 Air Exposure Pathway

The air exposure pathway accounts for hazardous substance migration in gaseous or particulate form through the air. Airborne transport of contaminants can be an exposure pathway for human and ecological receptors. No air sampling has been performed at this site, and the TPP Team agreed that air sampling would not be performed as part of this SI.

### 5.4.5.1 Climate

The climate at the site is described in subchapter 2.2.3.

### 5.4.5.2 Releases and Potential Releases to Air

There are no known direct releases of MC to air at the MRS02- Hand Grenade Court and none of the potential MC are volatile. During dry and windy conditions, soil particulates can become airborne. If there were releases of MC to soil because of DoD munitions activities, it is possible that the constituents would migrate to air via

resuspension of soil particulates. The occurrence of windblown soil particulates may be expected at this site. As described in Subchapter 5.4.4.5, iron and zinc were detected in surface soil samples at this MRS indicating that MC contamination may be present and released to air. However, the human health screening values selected for use in this SI are protective of inhalation pathways.

### 5.4.5.3 Air Exposure Pathway and Receptors

Based on the known current and future land use of the MRS02- Hand Grenade Court, potential receptors in this MRS include visitors/recreational users, commercial/industrial workers, and ecological receptors. Exposure would occur through inhalation of resuspended particulates.

### 5.4.5.4 Air Sample/Monitoring Locations and Methods

No air sampling is known to have been previously performed at the MRS02- Hand Grenade Court and the TPP Team agreed that air sampling would not be conducted as part of this SI.

### 5.4.5.5 Air Analytical Results

Not applicable.

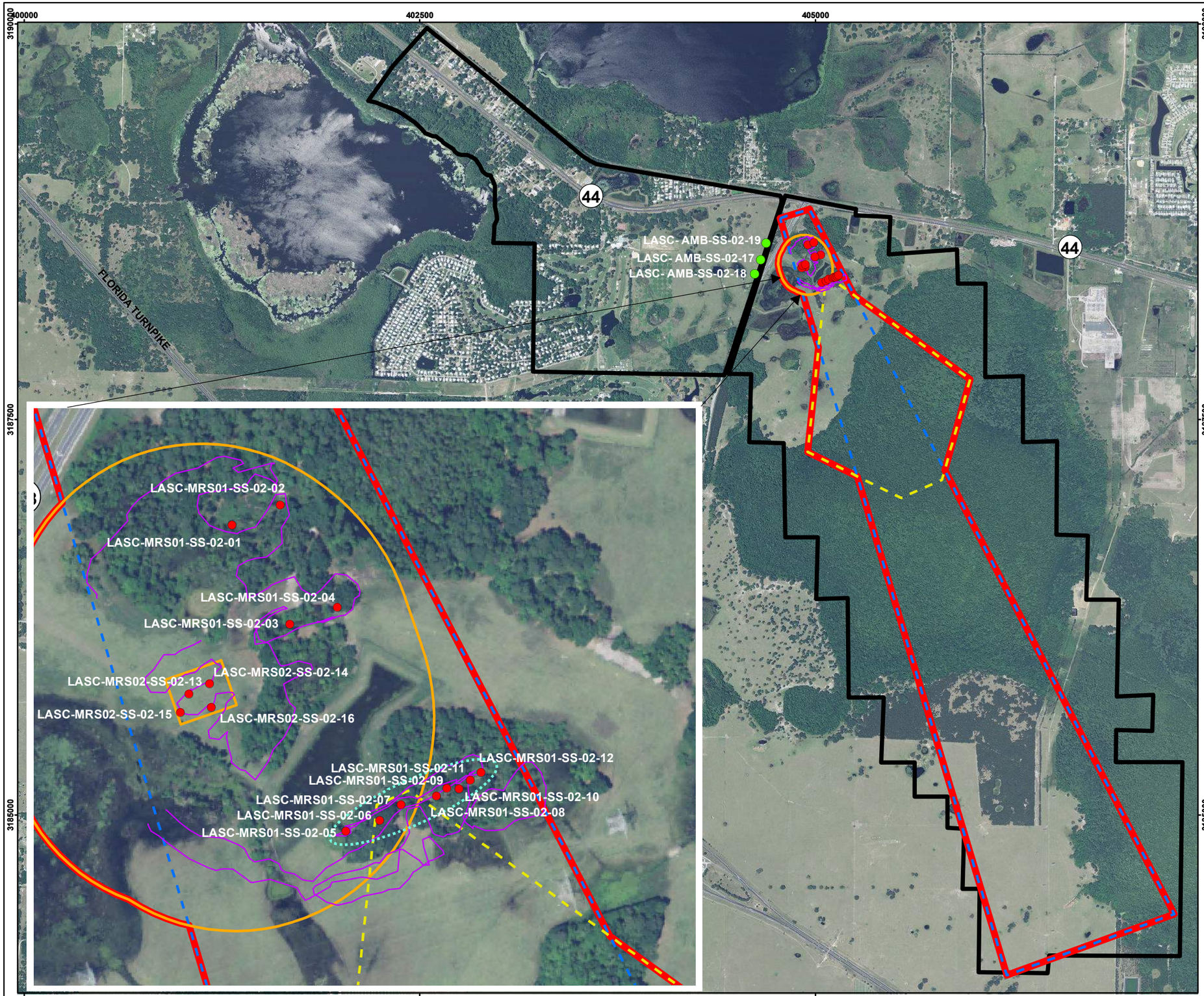
### 5.4.5.6 Air Exposure Pathway Conclusions

Based on the current and future land use of the MRS02- Hand Grenade Court, potential receptors in this MRS include visitors/recreational users, commercial/industrial workers, and ecological receptors. As discussed in Subchapter 5.4.4.5, two MC metals (iron and zinc) were detected in surface soil at the MRS. Based on these results, the air exposure pathway is complete for human receptors present at the MRS. The air exposure pathway for human receptors is assessed through the soil exposure pathway, as the human health screening values for soil include inhalation. The ecological screening values for soil do not evaluate this pathway, so the inhalation exposure pathway is potentially complete, but not quantitatively assessed, for ecological receptors.

Figure 5.1

# Qualitative Reconnaissance and Sample Locations
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- Soil Sample Location
- Ambient Soil Sample Location
- Qualitative Reconnaissance Track
- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Berm Location
- Hand Grenade Court MRS
- FUDS Boundary


Site Location in Florida

N

Image: 2010 Orthophotos
Projection: UTM Zone 17 NAD83, Map Units in Meters

800 400 0 800 Meters

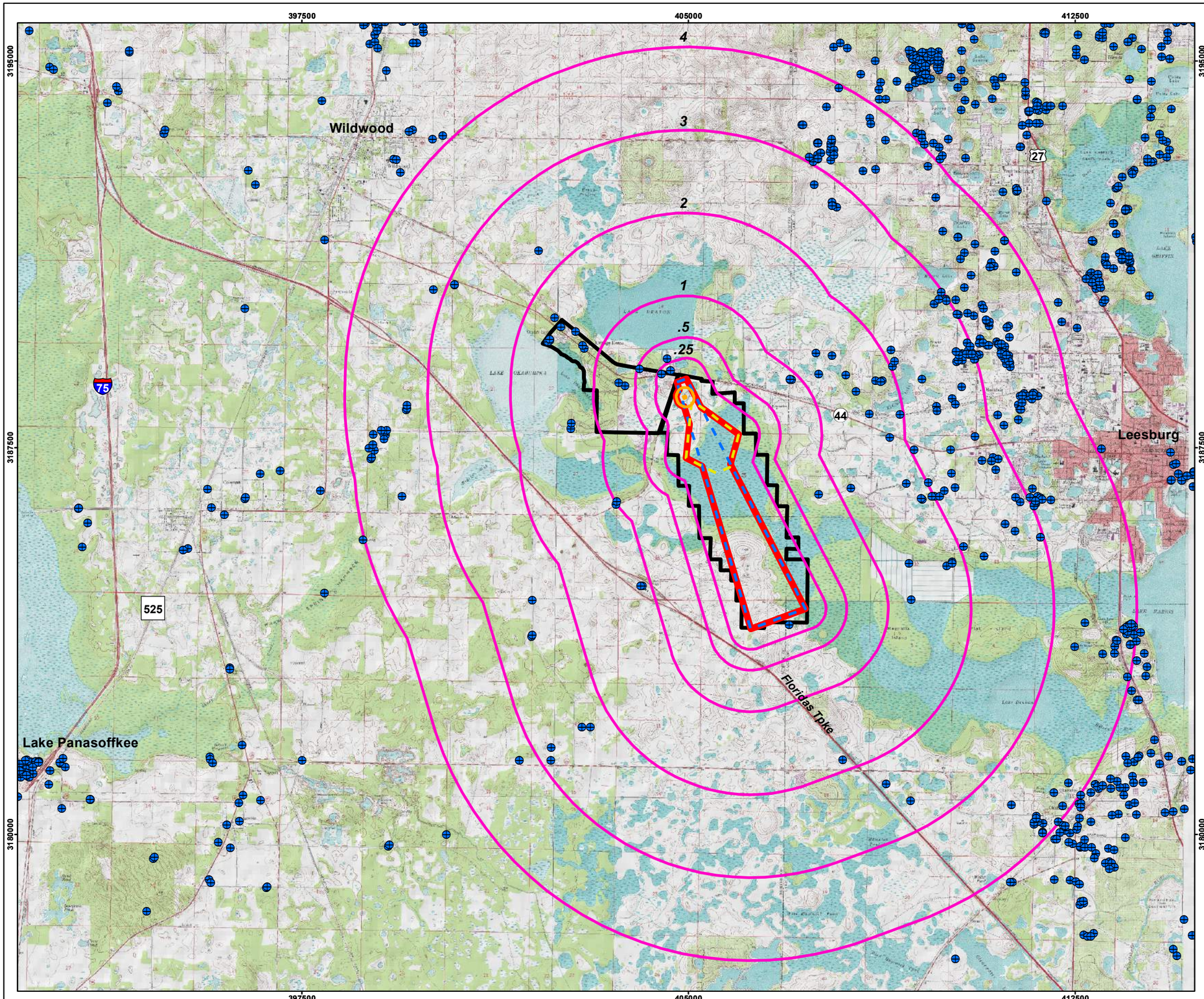
| | |
|---|---|
| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

| | | |
|---|---|---|
| DESIGNED BY: BT | Qualitative Reconnaissance and Sample Locations | |
| DRAWN BY: BT | SCALE: As Shown | PROJECT NUMBER: 748037.10014 |
| CHECKED BY: TB | DATE: December 2011 | PAGE NUMBER: 5-25 |
| SUBMITTED BY: TD | FILE: X:\GIS\Site_inspections_ne\Maps\leesburg_FL\Fig5_1.mxd | |

Figure 5.2

# Water Wells Within 4-Mile Buffer
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida




## Legend

- Active Water Well Location
- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Hand Grenade Court MRS
- FUDS Boundary
- Buffer (Mile)


Site Location in Florida

N

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 17 NAD83, Map Units in Meters

2 1 0 2 Kilometers

| | |
|---|---|
| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

| | | |
|---|---|---|
| DESIGNED BY: BT | **Water Wells Within 4-Mile Buffer** | |
| DRAWN BY: BT | | |
| CHECKED BY: TB | SCALE: As Shown | PROJECT NUMBER: 748037.10014 |
| SUBMITTED BY: TD | DATE: October 2011 | PAGE NUMBER: 5-26 |
| | FILE: X:\GIS\Site_inspections_ne\Maps\leesburg_FL\Fig5_2.mxd | |

Figure 5.3

# Wetlands
# Leesburg Air Service Center
# FUDS Project No. I04FL014301

Sumter County, Florida

405000

3187500

## Legend

- 300 Yard Known Distance Rifle Range MRS
- Pistol Subrange
- Rifle Subrange
- Hand Grenade Court MRS
- FUDS Boundary
- Wetland (Obtained from U.S. Fish & Wildlife Service)

Predominant Wetland Type:
PFO6F- Palustrine, forested, deciduous, semi-permanently flooded
PFO1/3C- Palustrine, forested, broad-leaveddeciduous/broad-leaved evergreen, seasonally flooded
PFO6C - Palustrine, forested, deciduous, seasonally flooded
PEM1F - Palustrine, persistent, semi-permanently flooded


Site Location in Florida

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 17 NAD83, Map Units in Meters

N

1 0.5 0 1 Kilometers

| | |
|---|---|
| PARSONS | U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER |

| | | | |
|---|---|---|---|
| DESIGNED BY: BT | **Wetlands** | | |
| DRAWN BY: BT | | | |
| CHECKED BY: TB | SCALE: As Shown | PROJECT NUMBER: 748037.10014 | |
| SUBMITTED BY: TD | DATE: October 2011 | PAGE NUMBER: 5-27 | |
| | FILE: X:\GIS\Site_inspections_ne\Maps\leesburg_FL\Fig5_3.mxd | | |

# CHAPTER 6
# SCREENING-LEVEL RISK ASSESSMENT

## 6.1 MUNITIONS AND EXPLOSIVES OF CONCERN SCREENING-LEVEL RISK ASSESSMENT

### 6.1.1 Conceptual Site Model

The Conceptual Site Model (CSM) for the Leesburg ASC FUDS included in Appendix J, summarizes conditions at the site that could result in human exposure to MEC. It describes the types of MEC potentially present in the MRS, past MEC and MD findings, and current and projected future land use and receptors.

### 6.1.2 Introduction

6.1.2.1 A qualitative risk evaluation was conducted to assess the potential explosive safety risk to the public at the Leesburg ASC. The purpose of this risk evaluation is to qualitatively communicate whether a potential risk is present at the site and the primary causes of that potential risk. The risk evaluation presented here is based on historical information presented in prior studies (for example, INPR, INPR Supplement, and HRR) and observations made during the SI while conducting QR.

6.1.2.2 An explosive safety risk exists if a person can come near or into contact with a MEC item and interact with it in a manner that results in a detonation. The potential for an explosive safety risk depends upon the presence of three critical elements:

- a source (*such as,* presence of MEC), AND
- a human receptor (*such as,* a person), AND
- the potential for interaction between the source and receptor (such as, the possibility that the item might be picked up or disturbed by the receptor).

6.1.2.3 All three of these elements must be present for there to be an explosive safety risk. There is no risk if any one element is missing. Each of these three elements provides a basis for implementing effective risk-management response actions.

### 6.1.3 Qualitative Risk Evaluation

6.1.3.1 The potential risk posed by MEC was characterized qualitatively by evaluating three primary risk factors for each MRS at a site. These factors are related to the three critical elements listed above and are:

1) MEC Presence: whether there is the potential for MEC to be present at the MRS;
2) MEC Type: the type(s) of MEC that might be present at the MRS and the related potential explosive hazards; and
3) Site Accessibility: the potential receptors at the MRS and how they might interact with the MEC.

6.1.3.2 The known or suspected presence of an explosive hazard and any potential human receptors at a MRS is typically sufficient justification for RI/FS. The following paragraphs describe each of the primary risk factors.

6.1.3.3 **MEC Presence**: this factor describes whether MEC either has been confirmed or is suspected to be present at the MRS, either at the surface or in the subsurface, and is based on historical information presented in prior studies (for example, INPR, INPR Supplement and HRR) and observations made during the SI while conducting QR. Note that if there is historical evidence of potential MEC presence at a site, lack of confirmation of MEC presence during the SI QR is not evidence of MEC absence for this qualitative risk evaluation. Table 6.1 lists the three possible categories used to describe MEC Presence for this evaluation.

**Table 6.1**
**Categories of MEC Presence**

| MEC Presence | Description |
|---|---|
| Confirmed or suspected | There is physical or confirmed historical evidence of MEC presence at the MRS, or there is physical or historical evidence indicating that MEC may be present at the MRS. |
| Small arms only (1) | The presence of small arms ammunition is confirmed or suspected, and there is evidence that no other types of munitions were used or are present at the MRS. |
| Evidence of no munitions | Following investigation of the MRS, there is physical or historical evidence that there are no UXO or discarded military munitions (DMM) present. |

(1) Small arms ammunition is defined as "ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller or for shotguns" (Department of the Army, 2005).

6.1.3.4 **MEC Type**: this factor describes whether the MEC potentially present at the MRS might be detonated, resulting in injury to one or more human receptors. If multiple MEC items are potentially present at an MRS, the item that poses the greatest risk to public health is selected for purposes of this qualitative risk evaluation. This determination is based on historical information presented in prior studies (for example, INPR, INPR Supplement, and HRR) and observations made during the SI while conducting QR. Table 6.2 lists the three possible categories used to describe MEC Presence for this evaluation.

**Table 6.2**
**Categories of MEC Type**

| MEC Type | Description |
|---|---|
| Potentially Hazardous | Fuzed or unfuzed MEC that may result in physical injury to an individual if detonated by an individual's activities. |
| Small arms only (1) | Small arms ammunition is confirmed or suspected, and there is evidence that no other types of munitions were used or are present at the MRS. |
| Inert | Munitions debris or other items that will cause no injury (for example, training ordnance containing no explosives, fuzes, spotting charges, etc.). |

(1) Small arms ammunition is defined as "ammunition, without projectiles that contain explosives (other than tracers), that is .50 Caliber or smaller or for shotguns" (Department of the Army, 2005).

6.1.3.5 **Site Accessibility**: this factor describes whether human receptors have any access to the MRS and, therefore, may interact with any MEC that is present at the surface or in the subsurface. For purposes of this qualitative risk evaluation, if MEC is confirmed or suspected to be present at the MRS, it is assumed that human receptors might come into contact with that MEC unless there is "Complete Restriction to Access." A description of the potential receptors is given with this assessment. Table 6.3 lists the two possible categories used to describe Site Accessibility for this evaluation.

**Table 6.3**
**Categories of Site Accessibility**

| Site Accessibility | Description |
|---|---|
| Accessible | Access control is not complete: residents, site workers, visitors, or trespassers can gain access to all or part of the MRS. |
| Complete restriction to access | Human receptors are completely prevented from gaining access to the MRS. |

6.1.3.6 With regard to this qualitative risk evaluation, further evaluation (such as, RI/FS) for the MRS will typically be justified if the following conditions are true:

- MEC is confirmed or suspected to be present, AND
- The MEC confirmed or suspected to be present is potentially hazardous, AND
- The MRS is accessible.

6.1.3.7 The primary risk factors identified above were evaluated for the MRSs at the Leesburg ASC using the data collected during the SI field investigation and the historical data available from other studies. The following sections discuss the qualitative risk evaluation by each primary risk factor to determine whether further evaluation is justified at the MRS.

### 6.1.4 Munitions and Explosives of Concern Risk Assessment – MRS01- 300 Yard Known Distance Rifle Range

6.1.4.1 MEC/MD were not observed at the MRS01- 300 Yard Known Distance Rifle Range during the SI field activities in August 2011. According to the INPR (USACE, 1994), no MEC or MD were observed during the site visit. Based upon the historic suspected use of the site (small arms only), the presence of MEC at the MRS01 – Rifle Range is ***"Evidence of no munitions."***

6.1.4.2 Based on the INPR Supplement (USACE, 2004) the potential munitions used at the MRS01- 300 Yard Known Distance Rifle Range consist of .22 Caliber, .30 Caliber, .38 Caliber, and .45 Caliber small arms munitions. These munitions do not present a residual explosive hazard if they remain at the site intact. Based on this information, the MEC Type at the MRS01- 300 Yard Known Distance Rifle Range is ***"Small arms only."***

6.1.4.3 The MRS01- 300 Yard Known Distance Rifle Range is currently timberland/wetlands and unimproved land with portions used as pasture. Although part of the property is fenced, there are no access restrictions. Based on these land uses and the lack of complete access restrictions, it is possible that human and ecological receptors might access the MRS. Based on this information, the Site Accessibility at the MRS01- 300 Yard Known Distance Rifle Range is ***"Accessible."***

### 6.1.5 Munitions and Explosives of Concern Risk Assessment – MRS02- Hand Grenade Court

6.1.5.1 MEC/MD were not observed at the MRS02– Hand Grenade Court during the SI field activities in August 2011. According to the INPR (USACE, 1994), no MEC or MD were observed during the site visit. Based upon the historic suspected use of the site (HE grenades), the presence of MEC at the MRS02 – Hand Grenade Court is assessed to be ***"Confirmed or suspected."***

6.1.5.2 Based on the 2010 FUDSMIS (USACE, 2010), the potential munitions used at the MRS02 – Hand Grenade Court consist of practice and fragmentation (HE) hand grenades. These fragmentation hand grenades present a residual explosive hazard if they remain at the site intact. Based on this information, the MEC Type at the MRS02 – Hand Grenade Court is ***"Potentially Hazardous."***

6.1.5.3 MRS02– Hand Grenade Court is currently owned by a private corporation. The MRS is undeveloped land used as pasture. Due to the lack of access restrictions, human and ecological receptors might access the MRS. Based on this information, the Site Accessibility at the MRS02 – Hand Grenade Court is ***"Accessible."***

### 6.1.6 Risk Summary

6.1.6.1 The qualitative MEC risk evaluation for the MRS01- 300 Yard Known Distance Rifle Range and the MRS02– Hand Grenade Court at the Leesburg ASC FUDS is summarized in Table 6.4.

6.1.6.2 Based on this qualitative MEC risk evaluation, there is little possibility that human receptors might come into contact with explosively hazardous MEC at the

MRS01- 300 Yard Known Distance Rifle Range; therefore, there is no potential for an explosive safety risk at this MRS.

6.1.6.3 Based on this qualitative MEC risk evaluation, there is a possibility that human receptors might come into contact with explosively hazardous MEC at the MRS02 – Hand Grenade Court; therefore, there is a potential for an explosive safety risk at this MRS.

**Table 6.4**
**MEC Risk Evaluation**
**Leesburg ASC, Sumter County, FL**

| MRS | MEC Presence | MEC Type (1) | | Site Accessibility | Further Evaluation ? |
|---|---|---|---|---|---|
| MRS01– 300 Yard Known Distance Rifle Range | Evidence of no munitions | .22, .30, .38, and .45 Caliber | Small arms only | Accessible | No |
| MRS02– Hand Grenade Court | Confirmed or suspected | Fragmentation hand grenades (HE) | Potentially Hazardous | Accessible | Yes |

(1)-Where multiple MEC items were used at an MRS, the item which poses the greatest risk to public health is listed for purposes of this risk assessment.

## 6.2 MUNITIONS CONSTITUENT HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT

### 6.2.1 Conceptual Site Model

6.2.1.1 Based on the current and future land use, potential human receptors for the former Leesburg ASC MRSs include visitors/recreational users and commercial/industrial workers. The FUDS property is owned by Sumter County, various private individuals and corporations. The MRSs are currently timberland/wetlands and unimproved land, with some pastures used for cattle. County Road 468 crosses a small portion of the MRS01– 300 Yard Known Distance Rifle Range. A large residential development, named Southern Oaks, is planned for the southern portion of the FUDS and the MRS01- 300 Yard Known Distance Rifle Range.

6.2.1.2 Receptors would primarily be exposed to surface soil (incidental ingestion, dermal contact, and inhalation of resuspended particulates) at both MRSs. Exposure to surface water and sediment (dermal contact and incidental ingestion) is possible at the MRS01– 300 Yard Known Distance Rifle Range. Surface water is not present within MRS02- Hand Grenade Court. Exposure to groundwater is precluded by the absence of supply wells within both MRSs, so the groundwater exposure pathways are incomplete. The MC CSEMs (Appendix J) identifies affected media, transport mechanism, exposure routes, and potential receptors.

### 6.2.2 Affected Media

Direct release of MC from munitions activities within the MRSs would be primarily to surface soil. Migration of MC from surface soil to surface water and sediment is possible through runoff and erosion. MC in the surface soil can also become resuspended particulate matter in the air. Contaminant leaching from the surface soil to surficial groundwater is possible at the MRSs. However, there are no known wells used for drinking water within the boundaries of the MRSs, thereby rendering the ingestion as drinking water pathway incomplete. Based on decisions made at the TPP Meeting, sixteen surface soil samples were collected from biased locations within the two MRSs. Surface water and sediment were not sampled due to an absence of appropriate sources. Air and groundwater were also not sampled at this site.

### 6.2.3 Human Health Screening Values

6.2.3.1 Per agreement with FDEP, the TPP Team agreed that those selected analytes that are potential MC and are detected in the samples would be retained for consideration in the SLRA. The TPP Team for the Leesburg ASC FUDS selected the human health screening values for surface soil in the SS-WP. The screening values used are noted in the Tables 6.5 and 6.6.

6.2.3.2 The human health screening levels for surface soil were selected by the TPP Team for the Leesburg ASC FUDS and were identified in the SS-WP Addendum (Parsons, 2011b). The human health screening values for surface soil include the more stringent (lowest value) of the USEPA RSLs for Chemical Contaminants at Superfund Sites for Residential Soil, and the FDEP FAC 62-777 Soil Cleanup Target Levels (the more stringent of Direct Exposure Residential, Leachability Based on Freshwater Surface Water Criteria, and Leachability based on Groundwater Criteria). For the MRS02– Hand Grenade Court, the Leachability Based on Freshwater Surface Water Criteria was not used due to lack of surface water on-site. The screening levels used are noted in the SLRA table (Tables 6.5 and 6.6).

### 6.2.4 Risk Characterization

As discussed in Subchapter 5.2.8, the MC source evaluation is used to determine which analytes are retained for consideration in a SLRA. Only those analytes retained for consideration in the SLRA following the source evaluation are evaluated in this chapter. To complete the risk characterization at the Leesburg ASC, the maximum detected concentrations of each selected MC for each media were retained for consideration in the SLRA. These maximum detected concentrations were compared to the screening levels agreed to by the TPP Team, described above. For an analyte to be a potential health concern related to a release from munitions activities at the MRSs, it is necessary for the MC concentrations to exceed their risk-based screening values. The following subchapters evaluate the MRS01– 300 Yard Known Distance Rifle Range and the MRS02– Hand Grenade Court at the Leesburg ASC FUDS and any potential effects on human health.

### 6.2.5 MRS01 – 300 Yard Known Distance Rifle Range

**Surface Soil:** Twelve biased surface soil samples (LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-12) were collected from locations within the MRS01-300 Yard Known Distance Rifle Range. The samples were analyzed for explosives at the firing points and select metals antimony, copper, and lead were analyzed for the samples collected from the berm area. No explosives were detected at this MRS. The surface soil source evaluation for metals is presented in Table 5.4. As shown in Table 5.4, three MC metals (antimony, copper, and lead) were detected in the biased surface soil samples analyzed. Based on the results shown in Table 6.5, the maximum detected concentrations of these MC metals were below their respective human health screening values for surface soil at the MRS01-300 Yard Known Distance Rifle Range. ***Therefore, based on the analytical results presented in this report, a human health risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS***.

**Table 6.5**
**MRS01– 300 Yard Known Distance Rifle Range**
**Surface Soil Human Health Screening Level Risk Assessment**
**Leesburg ASC, Sumter County, Florida**

| Analyte | Units | Maximum Detected Site Concentration | Human Health Screening Values (1) | Exceeds Screening Level? |
|---|---|---|---|---|
| ***Metals*** | | | | |
| Antimony | mg/kg | 0.37 | 5.4 (2) | No |
| Copper | mg/kg | 4.1 | 150 (3) | No |
| Lead | mg/kg | 30 | 400 (3) | No |

(1) More stringent of USEPA RSLs for Chemical Contaminants at Superfund Sites for Residential Soil, June 2011 and FDEP FAC 62-777 Soil Cleanup Target Levels (more stringent of the Direct Exposure Residential, Leachability based on Groundwater Criteria, and Leachability Based on Freshwater Surface Water Criteria), February 2005.
(2) FAC 62-777 Soil Cleanup Target Levels, Leachability Based on Groundwater Criteria, February 2005 (http://www.dep.state.fl.us/waste/quick_topics/publications/wc/FinalGuidanceDocumentsFlowCharts_April2005/TechnicalReport2FinalFeb2005(Final3-28-05).pdf).
(3) FDEP FAC 62-777 Soil Cleanup Target Levels, Direct Exposure Residential, February 2005 (http://www.dep.state.fl.us/waste/quick_topics/publications/wc/FinalGuidanceDocumentsFlowCharts_April2005/TechnicalReport2FinalFeb2005(Final3-28-05).pdf).

mg/kg - milligrams per kilogram

### 6.2.6 MRS02- Hand Grenade Court

6.2.6.1 **Surface Soil:** Four biased surface soil samples (LASC-MRS02-SS-02-13 through LASC-MRS02-SS-02-16) were collected from locations within the MRS02– Hand Grenade Court. The samples were analyzed for explosives and MC metals iron and zinc. No explosives were detected at this MRS. The surface soil source evaluations for metals are presented in Table 5.5. As shown in Table 5.5, two MC metals (iron and zinc) were detected in the biased surface soil samples analyzed. Iron is not a CERCLA

hazardous substance; therefore, iron is not generally evaluated as a MC under the FUDS program. Based on the results shown in Table 6.6, the maximum detected concentration of zinc was below its human health screening value for surface soil at the MRS02– Hand Grenade Court. ***Therefore, based on the analytical results presented in this report, a human health risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS.***

6.2.6.2 At the request of FDEP, the iron results were reviewed for this site. The FDEP SCTL direct exposure value for iron is 53,000 mg/kg. The maximum detected concentration for iron at this MRS is 270 mg/kg, much lower than the SCTL value, and therefore not expected to pose a risk to human health.

**Table 6.6**
**MRS02– Hand Grenade Court**
**Surface Soil Human Health Screening Level Risk Assessment**
**Leesburg ASC, Sumter County, Florida**

| Analyte | Units | Maximum Detected Site Concentration | Human Health Screening Values (1) | Exceeds Screening Level? |
|---|---|---|---|---|
| ***Metals*** | | | | |
| Iron | mg/kg | 270 J | -- (2) | -- (2) |
| Zinc | mg/kg | 12 | 23,000 (3) | No |

(1) More stringent of USEPA RSLs for Chemical Contaminants at Superfund Sites for Residential Soil, June 2011 and FDEP FAC 62-777 Soil Cleanup Target Levels (more stringent of the Direct Exposure Residential and Leachability based on Groundwater Criteria), February 2005.
(2) Iron is an essential nutrient that is not expected to pose a risk to human receptors.
(3) USEPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites for Residential Soil, June 2011 (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_run_JUN2011.pdf).
mg/kg - milligrams per kilogram
**Data Qualifier:**
J - Analyte detected, estimated concentration.
No Code – Confirmed identification

### 6.2.7 Human Health Discussion

Antimony, copper, and lead were detected at the MRS01-300 Yard Known Distance Rifle Range and iron and zinc were detected at the MRS02– Hand Grenade Court. None of these detections exceeded the human health screening values for soil. ***Therefore, based on the analytical results presented in this report, a human health risk due to exposure to MC in surface soil at either MRS at the Leesburg ASC FUDS is not expected.***

## 6.3 MUNITIONS CONSTITUENT SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

Based on the information presented in Subchapter 5.2.5, the MRS01– 300 Yard Known Distance Rifle Range and MRS02– Hand Grenade Court are important ecological places because they support habitat suitable for T&E species and include wetland areas (Figure 5.3). This classification is based on a review of the Army Checklist for Important Ecological Places (USACE, 2006). Ecological receptors are potential receptors for exposure pathways at this site.

### 6.3.1 Conceptual Site Exposure Model

Based on the evaluation of exposure pathways conducted in Chapter 5, ecological receptors may be exposed to surface water (dermal contact, ingestion as drinking water, and incidental ingestion) and sediment (dermal contact and incidental ingestion) at the MRS01– 300 Yard Known Distance Rifle Range. Ecological receptors may be exposed to MC through ingestion of biota that have been exposed to MC in surface water. These exposure pathways are complete for surface water and sediment. Ecological receptors may be exposed to surface soil at both MRSs through incidental ingestion, dermal exposure, and inhalation of resuspended soil particulates. Therefore, the soil exposure pathways are complete for ecological receptors at the MRSs. The ecological screening values for soil do not evaluate the air exposure pathway, so the inhalation exposure pathway is potentially complete but not quantitatively assessed for ecological receptors. Ecological receptors might also be exposed indirectly to MC in surface soil by ingestion of biota that may have been exposed to MC; this exposure pathway is complete. The MC CSEM identifies affected media, transport mechanisms, exposure routes, and potential receptors. Appendix J presents the CSEMs developed for the MRSs.

### 6.3.2 Affected Media

Direct release of MC from munitions activities within the MRS would be primarily to surface soil. In addition, MC could migrate to surface water and sediment through runoff and erosion. MC in the surface soil can also become airborne in resuspended soil particulates. Contaminant leaching from the surface soil to surficial groundwater is possible at the MRSs; however, groundwater is not directly accessible to most ecological receptors and is not evaluated in this subchapter. Based on decisions made at the TPP Meeting, sixteen surface soil samples were collected from biased locations within the two MRSs. Surface water and sediment were not sampled due to an absence of appropriate sources. Air and groundwater were also not sampled at this site.

### 6.3.3 Ecological Screening Values

6.3.3.1 Per agreement with FDEP, the TPP Team agreed that those selected analytes that are potential MC and are detected in the samples would be retained for consideration in the SLERA. The TPP Team for the Leesburg ASC FUDS selected the ESVs for surface soil in the SS-WP Table 4.5. The screening values used are noted in the Tables 6.7 and 6.8.

6.3.3.2 The ecological screening values for surface soil are USEPA Region 4 Ecological Screening Values. When Region 4 ESVs are not available, ESVs were

obtained from the most recent version of the sources referenced in the PSAP Addendum (USACE, 2006).

6.3.3.3 ESVs are based on a number of conservative assumptions. These include assumptions concerning the types of receptors present at a site (for example, insectivores, terrestrial mammals, etc.) as well as exposure parameters (such as soil ingestion rate and receptor range). Site-specific information was not used to develop these ESVs. The use of site-specific information typically results in less conservative, and higher, ESVs.

### 6.3.4 Ecological Risk Characterization

Subchapter 5.2.8 describes how the analytical data for the Leesburg ASC were evaluated. Only those analytes retained for consideration in the SLERA following the source evaluation are evaluated in this chapter. To complete the ecological risk characterization for this site, the maximum detected concentration of each selected analyte was evaluated using the selected screening values (Subchapter 6.3.3). This comparison resulted in the calculation of a hazard quotient (HQ) for each analyte. Each HQ was calculated by determining the ratio of the maximum detected site concentration to the screening value. If the HQ is equal to or less than 1, the potential for ecological risk for that medium was considered negligible. If the HQ is greater than 1, unacceptable ecological risks cannot be ruled out based on the screening comparison alone. HQs that are greater than 1 should be reviewed to evaluate the significance of the exceedance.

### 6.3.5 MRS01– 300 Yard Known Distance Rifle Range

**Surface Soil:** Twelve biased surface soil samples LASC-MRS01-SS-02-01 through LASC-MRS01-SS-02-12) were collected from locations within the MRS01- 300 Yard Known Distance Rifle Range. The samples were analyzed for explosives at the firing points and select metals (antimony, copper, and lead) were analyzed for the samples collected from the berm area. No explosives were detected at this MRS. The surface soil source evaluation for metals is presented in Table 5.4. As shown in Table 5.4, three MC metals (antimony, copper, and lead) were detected in the biased surface soil samples analyzed. Based on the results shown in Table 6.7, the maximum detected concentrations of these MC metals were below the ESVs for soil at the MRS01-300 Yard Known Distance Rifle Range resulting in HQs less than 1. ***Therefore, based on the analytical results presented in this report, an ecological risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS.***

**Table 6.7**
**MRS01- 300 Yard Known Distance Rifle Range**
**Surface Soil Screening Level Ecological Risk Assessment**
**Leesburg ASC, Sumter County, Florida**

| Analyte | Units | Maximum Detected Site Concentration | Ecological Screening Values for Soil (1) | HQ |
|---|---|---|---|---|
| ***Metals*** | | | | |
| Antimony | mg/kg | 0.37 | 3.5 | <1 |
| Copper | mg/kg | 4.1 | 40 | <1 |
| Lead | mg/kg | 30 | 50 | <1 |

(1) - USEPA Region 4 Ecological Screening Values for Soil, November 30, 2001 (http://www.epa.gov/region04/waste/ots/ecolbul.html#tbl4).
mg/kg - milligrams per kilogram
**Data Qualifier:**
No Code – Confirmed identification

### 6.3.6 MRS02- Hand Grenade Court

6.3.6.1 **Surface Soil:** Four biased surface soil samples (LASC-MRS02-SS-02-13 through LASC-MRS02-SS-02-16) were collected from locations within the MRS02- Hand Grenade Court. The samples were analyzed for explosives and MC metals iron and zinc. No explosives were detected at this MRS. The surface soil source evaluations for metals are presented in Table 5.5. As shown in Table 5.5, two MC metals (iron and zinc) were detected in the biased surface soil samples analyzed. Iron is not a CERCLA hazardous substance; therefore, iron is not generally evaluated as a MC under the FUDS program. Based on the results shown in Table 6.8, the maximum detected concentration of zinc was below its ecological screening value for surface soil at the MRS02– Hand Grenade Court with a HQ less than 1. ***Therefore, based on the analytical results presented in this report, an ecological risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS.***

6.3.6.2 At the request of FDEP, the iron results were reviewed for this site. The USEPA Region 4 soil ESV for iron is 200 mg/kg. The maximum detected concentration for iron at this MRS is 270 mg/kg, slightly higher than the Region 4 value, resulting in a HQ of 1.3. All three ambient soil samples collected had detections of iron; 970 mg/kg, 760 mg/kg, and 100 mg/kg.

**Table 6.8**
**MRS02– Hand Grenade Court**
**Surface Soil Screening Level Ecological Risk Assessment**
**Leesburg ASC, Sumter County, Florida**

| Analyte | Units | Maximum Detected Site Concentration | Ecological Screening Values for Surface Water (1) | HQ |
|---|---|---|---|---|
| ***Metals*** | | | | |
| Iron | mg/kg | 270 J | -- (2) | --(2) |
| Zinc | mg/kg | 12 | 50 | <1 |

(1) - USEPA Region 4 Ecological Screening Values for Soil, November 30, 2001 (http://www.epa.gov/region04/waste/ots/ecolbul.html#tbl4).
(2) Iron is an essential nutrient that is not expected to pose a risk to ecological receptors.
mg/kg - milligrams per kilogram
**Data Qualifier:**
J - Analyte detected, estimated concentration.
No Code – Confirmed identification

### 6.3.7 Ecological Discussion

Antimony, copper, and lead were detected at the MRS01-300 Yard Known Distance Rifle Range and iron and zinc were detected at the MRS02– Hand Grenade Court. At the MRS02- Hand Grenade Court, the maximum detected concentration of iron (270 mg/kg) slightly exceeded its ESV (200 mg/kg), resulting in a HQ of 1.3. In addition, the data qualifier for this detection is a "J", indicating an estimated value. Based on these results, an ecological risk is not expected from iron at this MRS. Antimony, copper, lead, and zinc detections did not exceed their respective ecological screening values for surface soil at either MRS and have HQs less than 1. ***Therefore, based on the analytical results presented in this report, an ecological risk due to exposure to MC in surface soil at either MRS at the Leesburg ASC FUDS is not expected.***

# CHAPTER 7
# SUMMARY AND CONCLUSIONS

## 7.1 SUMMARY

7.1.1 Two MRSs (MRS01– 300 Yard Known Distance Rifle Range and the MRS02- Hand Grenade Court) were identified at the Leesburg ASC in Sumter County, Florida, and evaluated to determine the potential to cause significant MEC and/or MC presence to the environment or to adversely affect human and ecological receptors. The evaluation included the collection of surface soil samples, as well as the implementation of QR within the MRSs during August 2011.

7.1.2 Construction of the Leesburg ASC was completed in May 1943. The site was used as a satellite training facility of the Army Air Forces School of Applied Tactics based in Orlando, FL. The former Leesburg ASC consisted of two main sections – Orange Home Tent Camp (northwest portion of the FUDS) and the adjacent MRS01- 300 Yard Known Distance Rifle Range and MRS02- Hand Grenade Court (southeastern portion of the FUDS). The Orange Home Tent Camp was located in the northwestern portion of the FUDS and was comprised of 587 acres, of which 215 acres were used as an ordnance storage site. Conventional ordnance items associated with Leesburg ASC include small arms (.22, .30, .38, and .45 Caliber) and potential grenade use (hand fragmentation [HE] and hand practice) (USACE, 2010).

## 7.2 MUNITIONS AND EXPLOSIVES OF CONCERN EXPOSURE PATHWAYS

7.2.1 A MEC SLRA was conducted based on the QR performed in the field as part of this SI and historical data regarding previous site visits and removal actions (Chapter 6). During the 2011 site visit, no MD or MEC were observed within the MRS01- 300 Yard Known Distance Rifle Range or the MRS02- Hand Grenade Court. However, ***within the MRS01- 300 Yard Known Distance Rifle Range, a berm approximately 10 feet high and 400 feet in length was observed by the SVT.***

7.2.2 Based on the 1994 INPR, 2004 INPR Supplement, 2010 HRR, and the 2010 FUDMIS, it is very unlikely that any MEC exist on or around portions of the MRS01- 300 Yard Known Distance Rifle Range. The MRS was utilized for small arms training and the potential munitions (.22 Caliber, .30 Caliber, .38 Caliber, and .45 Caliber) used do not pose a residual explosive risk if left at the site intact. ***Therefore, the MEC exposure pathways for the MRS01- 300 Yard Known Distance Rifle Range are incomplete and an explosive safety risk is not present.***

7.2.3 Based on the 2010 HRR, and the 2010 FUDMIS MEC may remain on or around portions of the MRS02- Hand Grenade Court. Live grenades containing HE and practice grenades were potentially utilized during training exercises at this MRS. The potential munitions (hand fragmentation [HE] and hand practice) pose a residual

explosive risk if left at the site intact. ***Therefore, the MEC exposure pathways for the MRS02- Hand Grenade Court are complete and an explosive safety risk may exist.***

## 7.3 CONCLUSIONS REGARDING POTENTIAL MUNITIONS CONSTITUENTS EXPOSURE PATHWAYS

7.3.1 An exposure pathway is not completed unless all four of the following elements are present (USEPA, 1989):

- A source and mechanism for chemical release;
- An environmental transport/exposure medium;
- A receptor exposure point; and
- A receptor and a likely route of exposure at the exposure point.

### 7.3.2 MRS01- 300 Yard Known Distance Rifle Range

7.3.2.1 Based on the current and future land use of the MRS01- 300 Yard Known Distance Rifle Range, potential receptors in this MRS include visitors/recreational users, commercial/industrial workers, and ecological receptors. The drinking water exposure pathway is not complete for humans as the surface water is not used as a drinking water source but is complete for ecological receptors. Human receptors could be exposed to MC in the surface water/sediment through incidental ingestion and dermal contact and these pathways are potentially complete, but not quantitatively assessed because surface water and sediment were not sampled. Ecological receptors could be exposed to MC in surface water and sediment through ingestion as drinking water, incidental ingestion, and dermal contact. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with surface water or sediment. These exposure pathways are also potentially complete, but not quantitatively assessed because surface water and sediment were not sampled. The groundwater exposure pathways are incomplete for all receptors because there are no wells located within this MRS. The surface soil exposure pathways are complete for all receptors, as MC metals antimony, copper, and lead were detected in the soil samples collected. The maximum detected concentrations of copper and lead did not exceed their human health screening values for surface soil at the MRS01- 300 Yard Known Distance Rifle Range; therefore, based on the analytical results presented in this report, ***an unacceptable human health risk due to former munitions-related activities is not expected from exposure to MC in the surface soil at the MRS01- 300 Yard Known Distance Rifle Range.***

7.3.2.2 The maximum detected concentrations of antimony, copper, and lead did not exceed the ESVs for surface soil at the MRS01- 300 Yard Known Distance Rifle Range producing HQs less than 1. Therefore, based on the analytical results presented in this report, ***an unacceptable ecological risk due to former munitions-related activities is not expected from exposure to MC in the surface soil at the MRS01- 300 Yard Known Distance Rifle Range.***

### 7.3.3 MRS02 – Hand Grenade Court

7.3.3.1 Based on the current and future land use of the MRS02- Hand Grenade Court, potential receptors in this MRS include visitors/recreational users, commercial/industrial workers, and ecological receptors. The groundwater exposure pathways are incomplete at this MRS for both human and ecological receptors; no wells are located within this MRS. The surface water exposure pathways account for the potential threat to human and ecological receptors on or near the MRS02– Hand Grenade Court who may be exposed to MC in surface water. Human receptors may be exposed to MC in surface water or sediment via incidental ingestion or dermal exposure. The drinking water exposure pathway is not present for humans because the surface water is not used as a drinking water source. Ecological receptors could be exposed to MC in surface water through ingestion as a drinking water source. Ecological receptors may also be exposed to MC through ingestion of biota that have been in contact with the surface water or sediment. All surface water and sediment exposure pathways are incomplete because there is no surface water within this MRS. No explosives were detected at this MRS; however, MC metals iron and zinc were detected in the biased surface soil samples analyzed. Iron is not a CERCLA hazardous substance; therefore, iron is not generally evaluated as a MC under the FUDS program. The maximum detected concentration of zinc was below its human health screening value for surface soil at the MRS02– Hand Grenade Court. ***Therefore, based on the analytical results presented in this report, a human health risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS.***

7.3.3.2 The maximum detected concentration of zinc was below its ecological screening value for surface soil at the MRS02– Hand Grenade Court with a HQ less than 1. ***Therefore, based on the analytical results presented in this report, an ecological risk due to former munitions-related activities is not expected from exposure to surface soil at this MRS.***

## 7.4 OVERALL CONCLUSIONS

### 7.4.1 Human Health

No MEC or MD were found within the MRS01 – 300 Yard Known Distance Rifle Range or the MRS02- Hand Grenade Court during the 2010 SI or previous investigations. Antimony, copper, and lead were detected at the MRS01-300 Yard Known Distance Rifle Range and iron and zinc were detected at the MRS02– Hand Grenade Court. None of these detections exceeded the human health screening values for soil. ***Therefore, based on the analytical results presented in this report, a human health risk due to exposure to MC in surface soil at either MRS at the Leesburg ASC FUDS is not expected.***

### 7.4.2 Ecological

No MEC or MD was found within the MRS01 – 300 Yard Known Distance Rifle Range or the MRS02- Hand Grenade Court during the 2010 SI or previous investigations. Antimony, copper, and lead were detected at the MRS01- 300 Yard Known Distance Rifle Range and iron and zinc were detected at the MRS02– Hand Grenade Court.

Antimony, copper, lead, and zinc detections did not exceed their respective ecological screening values for surface soil and have HQs less than 1. Iron is not a CERCLA hazardous substance; therefore, iron is not generally evaluated as a MC under the FUDS program. ***Therefore, based on the analytical results presented in this report, an ecological risk due to exposure to MC in surface soil at either MRS at the Leesburg ASC FUDS is not expected.***

### 7.4.3 Iron

Although iron is not a CERCLA hazardous substance and is not expected to pose a risk to human or ecological receptors, it is listed in Table 4.1 as a selected metal for the potential munitions utilized at the MRS02- Hand Grenade Court. At the request of FDEP, the human health and ecological results for iron were reviewed for the MRS02-Hand Grenade Court. The FDEP SCTL human health direct exposure value for iron is 53,000 mg/kg. The maximum detected concentration for iron at this MRS is 270 mg/kg, much lower than the SCTL value, and therefore not expected to pose a risk to human health. The USEPA Region 4 soil ESV for iron is 200 mg/kg. The maximum detected concentration for iron at this MRS is 270 mg/kg, slightly higher than the Region 4 value, resulting in a HQ of 1.3. It should also be noted that all three ambient soil samples collected had detections of iron; 970 mg/kg, 760 mg/kg, and 100 mg/kg. Based on these results, an ecological risk is not expected from iron at this MRS.

# CHAPTER 8
# RECOMMENDATIONS

8.1 Based on the August 2011 SI field effort, the analysis results, and the historical record review, the MRS01 – 300 Yard Known Distance Rifle Range and the MRS02 – Hand Grenade Court at the Leesburg ASC FUDS in Sumter County, Florida are recommended for ***NDAI*** and ***RI/FS*** respectively (Table 8.1). ***Munitions removal actions are not warranted at this time.*** The NDAI recommendation for the MRS01 – 300 Yard Known Distance Rifle Range is based on the following:

- MEC/MD were not observed at the MRS01 – 300 Yard Known Distance Rifle Range during the SI field activities in August 2011. No MEC or MD have been observed and no injuries have been reported at the MRS01 – 300 Yard Known Distance Rifle Range since site closure.
- Based on the 2004 INPR Supplement, 2010 HRR and 2010 FUDSMIS the potential munitions used at the MRS01 – Rifle Range consist of .22 Caliber, .38 Caliber, .30 Caliber, and .45 Caliber small arms munitions. These munitions do not present a residual explosive hazard if they remain at the site intact. Based on the qualitative MEC risk evaluation (subchapter 6.1), it is unlikely that human receptors might come into contact with explosively hazardous MEC at the MRS01 – 300 Yard Known Distance Rifle Range. Therefore, there is no potential for an explosive safety risk at this MRS.
- The maximum detected concentrations of antimony, copper, and lead did not exceed their human health or ESVs for surface soil at the MRS01 – 300 Yard Known Distance Rifle Range.

8.2 The RI/FS recommendation for the MRS02– Hand Grenade Court is based on the following:

- Based on the 2010 HRR and 2010 FUDSMIS the potential munitions used at the MRS02– Hand Grenade Court consist of live (HE) and practice grenades. Some of these munitions present a residual explosive hazard if they remain at the site intact. Based on the qualitative MEC risk evaluation (subchapter 6.1), there is a possibility that human receptors might come into contact with explosively hazardous MEC at the MRS02– Hand Grenade Court. Therefore, there is a potential for an explosive safety risk at this MRS.

**Table 8.1**
**Recommendations**
**Leesburg ASC, Sumter County, Florida**

| MRS | Acreage | Munitions and Explosive of Concern and/or Munitions Debris Assessment (1) | Munitions Constituents Assessment (2) | Recommendation |
|---|---|---|---|---|
| MRS01– 300 Yard Known Distance Rifle Range | 1112 | ***No*** USACE documents issued since site closing confirm the use of the site as a small arms range. The munitions suspected to have been used at this MRS do not present a residual explosive hazard if any remain at the site intact | ***No*** An unacceptable risk to human receptors and ecological receptors via exposure to MC in surface soil is not expected at the MRS01– 300 Yard Known Distance Rifle Range | ***NDAI*** |
| MRS02– Hand Grenade Court | 24.92 | ***Yes*** USACE documents issued since site closing confirm the use of the site as a potential grenade range. Some of the munitions (live grenades) suspected to have been used at this MRS do present a residual explosive hazard if any remain at the site intact | ***No*** An unacceptable risk to human receptors and ecological receptors via exposure to MC in surface soil is not expected at the MRS02-Hand Grenade Court | ***RI/FS*** |

Notes:
(1) "Yes" in this column indicates confirmed MEC or MD presence indicative of potential MEC presence, resulting in a RI/FS recommendation for the MRS. "No" in this column indicates no confirmed MEC or MD indicative of potential MEC presence.
(2) "Yes" in this column indicates the presence of MC at levels indicating a potential elevated risk to human health or ecological receptors, resulting in a recommendation for further MC sampling during a RI/FS. "No" in this column of the table indicates the absence of MC at levels indicating a potential risk to human health or ecological receptors, resulting in a recommendation for no further MC sampling for the MRS.

# CHAPTER 9
# REFERENCES

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# APPENDIX A

# Performance Work Statement
# Electronic Only

SECTION C - DESCRIPTIONS AND SPECIFICATIONS

**PERFORMANCE WORK STATEMENT**
**FOR**
**Formerly Used Defense Sites (FUDS)**
**Military Munitions Response Program (MMRP)**
**Site Inspections (SI)**
**at Multiple Sites**
**(CONUS and OCONUS)**
**24 May 2005**

**Revison #1: 8 July 2005**
**Revision #2: 27 July, 2006**
***Revision #3: 28 September, 2006***
**This is a firm fixed price Task Order**

**Revision #2 (27 July, 2006): This revision adds Perchlorate Sampling and Analysis and MRSPP Coordination to the requirements of this Task Order.**

***Revision #3 (28 September, 2006): This revision clarifies requirements for the MRSPP Coordination and specifies the Period of Performance.***

## 1.0 OBJECTIVE:

The objective of the MMRP SI is to determine whether the individual project sites within the FUDS program warrants further response action or no Department of Defense action indicated (NDAI).

## 2.0 BACKGROUND AND GENERAL STATEMENT OF WORK:

**2.1 Regulatory Guidelines.** The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program - Formerly Used Defense Sites (DERP-FUDS). Munitions and Explosives of Concern (MEC) exist on property formerly owned or leased by the Department of Army. USACE is conducting environmental response activities at FUDS in accordance with Engineer Regulation (ER) 200-3-1 and the DoD Management Guidance for the Defense Environmental Response Program (DERP). USACE is conducting these activities in accordance with CERCLA.

**2.1.1** MEC is a safety hazard and may constitute an imminent and substantial endangerment to the local populace and site personnel. The work associated with this Site Investigation(s) shall

be performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104, and the National Contingency Plan (NCP), Sections 300.120(d) and 300.400(e), Executive Orders 12580 and 13016.

**2.1.2** All activities involving work in areas potentially containing unexploded ordnance hazards shall be conducted in full compliance with Department of Defense (DoD), Department of Army, US Army Corps of Engineers (USACE), state, local and federal requirements regarding safety, personnel, equipment, and procedures. 29 CFR 1910.120 shall apply to all actions taken at this site.

**2.1.3** The project sites are not suspected to contain Recovered Chemical Warfare Materiel (RCWM); however, if the contractor identifies or suspects CWM, the contractor shall immediately withdraw upwind from the work area and notify the USAESCH Chemical Warfare Design Center and the USAESCH Ordnance and Explosives (OE) Safety Office for assistance and guidance. The contractor shall secure the area and locate two Unexploded Ordnance (UXO) Technicians at level II or above upwind of the suspect CWM to secure the site until relieved by the Technical Escort Unit (TEU) or Explosive Ordnance Disposal (EOD) personnel.

**3.0 Performance Work Statement:**

The following performance work statement will apply to all tasks/projects in this PWS.

The contractor shall perform the activities necessary to meet the objective in paragraph 1.0 of this PWS for munitions and explosives of concern (MEC) and munitions constituents (MC). MEC intrusive activities shall **not** be performed during this SI. Work shall be in accordance with (IAW) with ER 200-3-1, the DoD Management Guidance for the Defense Environmental Response Program (DERP), and Engineering Pamphlet (EP) 75-1-2.

The contractor shall collect the minimum amount of information necessary to (i) eliminate from further consideration those releases that pose no significant threat to public health or the environment; (ii) determine the potential need for a time critical removal action; (iii) collect or develop additional data, as appropriate, for Hazard Ranking System (HRS) scoring by

Environmental Protection Agency (EPA); and (iv) collect data, as appropriate, to characterize the release for effective and rapid initiation of the Remedial Investigation and Feasibility Study (RI/FS). The contractor shall also collect the appropriate data to complete the Munitions Response Site Prioritization Protocol (MRSPP).

Methods to be used to achieve the specified objectives shall be determined by the Contractor.

**Quality Control**. The Contractor shall implement an accepted Quality Control (QC) Program. The Quality Control Program shall include QC procedures for all aspects and types of work. The Contractor shall ensure that QC documentation is maintained, and provided in the Final Reports. If any Government QA review identifies a process failure or a work product failure, the contractor will be issued a Corrective Action Request (CAR). The Contractor shall provide full documentation detailing the cause of the failure, why it was not detected in the Contractor's QC Program, and how the problem was corrected. Failure can be defined as workmanship or work products not complying with the WP or not meeting project needs defined during TPP or other accepted industry practices or defined as not complying with basic safety concepts and other industry safety practices.

**Kick Off Meeting:** The Contractor(s) shall plan to attend a kick off meeting, after award, in Huntsville, Alabama for 1 day.

**Work Plan:** The contractor shall prepare and submit a programmatic SI Work Plan (WP) which will also address any contractor-specific programmatic information supplemental to the Programmatic Sampling and Analysis Plan provided by the government. The WP shall be prepared following the general format described in data item description (DID) MR-001. Deviations from this format will be accepted if they are for the purpose of consolidating topics into a single chapter or sub-chapter or for removing duplications. For each site, a site-specific Work Plan and SAP annex shall be prepared.

**Geographic Information System (GIS)**. The Contractor shall create a GIS in accordance with DID MR-005-07. The coordinate system for these tasks/projects shall be UTM Coordinates. All

geo-referenced data shall be submitted in UTM Coordinates.

**Munitions Constituents Sampling and Analysis:** MC sampling and analysis shall be performed IAW Final Programmatic SAP and applicable Site-Specific SAP. Any exceptions to the Programmatic SAP must be clearly indicated in the Site-Specific SAP. Contractor shall determine in consultation with their subcontractor laboratory appropriate analytical methodology to meet or exceed the data quality objectives provided in Table 1 of the Programmatic SAP. If these DQOs cannot be met with standard analytical methodology, provide recommendation for best value approach. Technical proposal shall provide laboratory's proposed reporting limits along with their method detection limits. It shall also describe laboratory's procedures for subsampling and sample preparation for explosives and any method variations to address analytes not addressed by routine methods, such as PETN and nitroglycerine. For aqueous samples, solid phase extraction rather than salting out extraction shall be used.

The contractor shall address MC sampling and analysis requirements and deliverables IAW with DID MR-005-10, with the following exceptions:

- The USACE validation process has been replaced. The contractor shall use a laboratory that meets the requirements of the HTRW Chemical Data Quality Management (CDQM) Policy for Environmental Laboratory Testing (USACE, 2004), to include NELAP accreditation and self declaration of compliance with the DoD Quality Systems Manual (DoD QSM) (latest version). All laboratory requirements of DID MR 005-10 not related to the validation process continue to apply.
- Section 1.4 of DID MR-005-10 shall be modified as follows:

  **Electronic Data Deliverable; G.**

  All laboratory data for samples analyzed by commercial laboratories shall be submitted in the Staged Electronic Data Deliverable (SEDD) format. Details on the SEDD format are provided in SEDD Version 5.0 (or most recent version) specification located at http://www.epa.gov/superfund/programs/clp/sedd.htm. EDDs shall be provided to applicable Design Center and MM CX on a site-by-site basis IAW schedule provided in Contractor's proposal. SEDD Stage 2a is a mandatory submittal. SEDD Stage 2b should be provided if the laboratory is capable.

- Section 2.8 of DID MR-005-10 shall be modified as follows:

  2.8 ELECTRONIC DATA DELIVERABLE

  Chemical data shall also be provided electronically by the Contractor in the SEDD format and as part of the Geographic Information System. The SEDD formatted deliverable will require data parsing for use in the Automated Data Review (ADR) software (most current version). Use of the ADR software will also require that the contractor develop a comprehensive library file for all of the methods to be analyzed under this PWS. The library file will accurately reflect all of the analytical quality requirements as documented in the Final Programmatic SAP (or site-specific SAP, if deviations from the Programmatic SAP are approved) and will be provided to the appropriate Design Center, MM CX, and the sub-contract lab for use in screening EDD submittals. All electronic data submitted by the contract laboratory is required to be error-free, and in complete agreement with the hardcopy data. Data files are to be delivered both by e-mail and on high density CD accompanying the hardcopy data reports. The disk must be submitted with a transmittal letter from the laboratory that certifies that the file is in agreement with hardcopy data reports and has been found to be free of errors using the latest version of the ADR evaluation software provided to the laboratory. The contract laboratory, at their cost, will correct any errors identified by USACE. The Contractor is responsible for the successful electronic transmission of field and laboratory data under this PWS. The Contractor's laboratory is responsible for archiving the electronic raw data and sufficient associated hardcopy data (e.g., sample login sheets and sample preparation log sheets) to completely reconstruct the analyses that were performed for a period of ten years after completion of this contract.

- The following software is available upon request to support this task as government furnished software: ADR, Environmental Data Management System (EDMS), and Forms II Lite. Use of the ADR software is mandatory, use of EDMS and Forms II Lite are optional.
- Information required for completion of main SI Report need not be duplicated in SI Report Appendix containing **CHEMICAL DATA FINAL REPORT**

**Perchlorate Sampling and Analysis.** **Sampling and analysis for perchlorate shall be conducted IAW OSD Policy on DoD Required Actions Related to Perchlorate, DoD Perchlorate Handbook, and Interim Army Guidance on Perchlorate for Restoration/Cleanup Activities (or most recent version). Where potential for a DoD-related perchlorate source exists, the contractor shall include consideration of the need for perchlorate sampling and analysis in the project TPP. Analysis must be performed by Liquid Chromatography/Mass Spectrometry or Ion Chromatography/Mass Spectrometry. Either tandem or single mass spectrometry is acceptable. If the laboratory identified in the Contractor's initial proposal is unable to perform perchlorate analysis by one of these methods, Contractor may propose a supplemental laboratory for perchlorate analysis. If a supplemental laboratory is proposed, it must meet all PWS requirements and all documentation for new laboratory that was required for initial proposal must be provided.**

**SI Reports:** The Contractor shall prepare a final report using DID MR-030 as a guideline for general document format. The report content outline is attached as Appendix A. Each report shall identify the specific members and title of the Contractor's staff and subcontractors that had significant and specific input into the reports' preparation or review. The contractor shall also include a cover letter signed by an authorized person (preferably the person who signed the Task Order) of the company certifying, on behalf of the company, that the requirements of this Task Order have been met.

**MRSPP Coordination: The Contractor shall coordinate stakeholder participation for the MRSPP IAW 32 CFR Part 179, specifically:**

- **Notify stakeholders of the opportunity to participate in the Protocol application** ***at a meeting to be held immediately after (on the same day or the next day) the second TPP meeting. This is to be a meeting for the regulators and stakeholders only and will not include the public unless the specifically requested by the District.***
- **Publish announcements to request involvement in the application of the Protocol and information pertinent to prioritization or sequencing.** ***An ad in a local newspaper must run for 2 days, once during the week and once on Sunday.***
- **Include a copy of all notices and announcements in the project file**

- **Incorporate stakeholders' input in prioritization**
- **Include information influencing the priority in the project file**

**Schedule**: The Contractor shall submit a proposed programmatic project schedule in the proposal. Seven (7) days after Award the contractor shall submit and electronic copy (preferably by email) of the schedule. The schedule shall be adjusted and refined during the Technical Project Planning (TPP) process. The contractor shall update the schedule in accordance with DID MR-085, Project Status Report. A task/project specific schedule shall be submitted a minimum of 14 days after the completion of the TPP process. All schedules shall be in a format compatible with Primavera software.

**Teleconferences:** The Contractor shall participate in monthly MMRP teleconferences with HQ, MM CX, Technical PM, District PM, and other contractors to discuss project status and any issues that have arisen during the SI phase of work. The Contractor will be prepared to present issue resolution alternatives as part of these discussions.

**In Progress Review Meetings:** The Contractor shall attend Quarterly In-Progress Review (IPR) meetings on the MMRP SI with USACE representatives and other contractors at various CONUS locations. In addition, the Contractor will be expected to plan, coordinate, and host one IPR meeting each year.

**Reports/Minutes, Record of Meetings.** The Contractor shall prepare and submit a report/minutes of all meetings attended in accordance with DID MR-045.

**Telephone Conversations/Correspondence Records.** The Contractor shall keep a record of each phone conversation and written correspondence concerning this Task Order in accordance with DID MR-055. A copy of this record shall be attached to the Project Status Report.

**Project Status Reports**. The Contractor shall prepare and submit project status reports in accordance with DID MR-085 and include any other items required in the PWS.

**Specific Tasks/Projects:**

The specific Tasks/Projects below are shown in the table below. Along with the project, the responsible Geographic FUDS USACE District is shown as well as the USACE design center that will provide technical management and execute the project. The 4 (four) design centers are the Huntsville Center MM Design Center (HNC), Omaha District MM Design Center (NWO), South Pacific Division Range Support Center (SPD), Baltimore District MM Design Center (NAB).

An additional list of project sites is attached as Appendix B. This list will be used for optional future SI Projects based on funding and priority from DoD.

| Task # | District | FUDS ID | FUDS Name | MM DC | Perchlorate Sampling |
|---|---|---|---|---|---|
| 1.1 | SAW | I04NC107101 | Corolla Naval Target | HNC | YES |
| 1.2 | SAS | I04GA004503 | Camp Toccoa Mil Res | HNC | YES |
| 1.3 | SAJ | I04 FL 0405 | Pinecastle Jeep Range | HNC | YES |
| 1.4 | POH | H09HI024901 | Kane Puu | HNC | YES |
| 1.5 | LRL | G04KY0028 | Camp Breckinridge | HNC | YES |
| 1.6 | SAM | I04AL06700 | Fort McClellan | HNC | YES |
| 1.7 | POA | F10AK0291 | Burma Road | HNC | YES |
| 1.8 | SAC | I04SC0040 | Lake Murray Bombing & Gunnery Range | HNC | NO |
| 1.9 | SAW | I04NC080303 | Charlotte Naval Ammo Depot | HNC | NO |
| 1.10 | SAS | I04GA106401 | Arabia Mountain State Park | HNC | NO |
| 1.11 | SAJ | I04 FL 0856 | Chaffee Road Bomb Target | HNC | NO |
| 1.12 | SAC | I04SC0023 | Sand Hills Bombing & Gunnery Range | HNC | YES |
| 1.13 | POH | H09HI047601 | Big Island Target – Mahukona Range | HNC | NO |
| 1.14 | LRL | G04KY016506 | Kentucky Ordnance Works | HNC | NO |
| 1.15 | SAW | I04NC1085 | Southern Shores | HNC | YES |
| 1.16 | SAC | I04SC0042 | Lk Isaqueena Bom Rng | HNC | NO |
| 1.17 | SAJ | | | HNC | YES |
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| 2.1 | NAB | C03MD0930 | Assateague Island | NAB | NO |
| 2.2 | NAE | D01ME003200 | Seal Island Gunnery Range | NAB | NO |
| 2.3 | NAN | C02NJ0004 | Fort Hancock | NAB | YES |
| 2.4 | NAO | C03VA000901 | NAAS Creeds | NAB | YES |
| 2.5 | NAB | CO3DE0526 | Fort Delaware | NAB | NO |
| 2.6 | NAE | D01MA023204 | Hingham NAD | NAB | YES |
| 2.7 | NAN | C02NJ0792 | Millville Bomb & Gunnery Range | NAB | YES |

| Task # | District | FUDS ID | FUDS Name | MM DC | Perchlorate Sampling |
|---|---|---|---|---|---|
| 2.8 | NAO | C03VA020201 | Plum Tree Island | NAB | YES |
| 2.9 | NAB | C03PA0048 | Susquehanna Ordnance Sub-Depot | NAB | NO |
| 2.10 | NAO | C03VA0162 | Virginia Ordnance Works | NAB | NO |
| 2.11 | NAB | C03DE0528 | Governor Bacon Health Center | NAB | NO |
| 2.12 | NAO | C03VA0103 | Ft. Monroe/Ft. Wool | NAB | NO |
| 2.13 | NAO | C03VA1012 | Camp Wallace | NAB | YES |
| 2.14 | NAO | C03VA0194 | Chopawamic Troop Trng | NAB | YES |
| 2.15 | NAO | C03VA0027 | Ft. Lee | NAB | NO |
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| 3.1 | LRL | G05OH0007 | Lockbourne, AFB | NWO | YES |
| 3.2 | NWK | B07MO014601 | Jefferson Barracks Target Range | NWO | YES |
| 3.3 | NWO | B08WY042601 | Casper Ground Gunnery Range | NWO | NO |
| 3.4 | NWS | F10OR004102 | Camp Abbott | NWO | YES |
| 3.5 | LRL | E05MI003402 | Camp Claybanks AAA Firing Range | NWO | YES |
| 3.6 | NWK | B07KS002904 | Olathe Naval Air Station | NWO | NO |
| 3.7 | NWO | B08WY042901 | Casper Precision Bombing Range No. 3 | NWO | NO |
| 3.8 | NWS | F10OR002903 | Camp Adair | NWO | YES |
| 3.9 | LRL | G05IN0010 | Camp Atterbury | NWO | NO |
| 3.10 | LRL | G05OH002706 | Erie Army Depot | NWO | YES |
| 3.11 | LRL | G05IN001904 | Kingsbury Ordnance Plant | NWO | NO |
| 3.12 | LRL | E05MI001303 | Ft Custer Rec Area | NWO | YES |
| 3.13 | LRL | E05MI000501 | Camp Lucas/Camp Brady Target Range | NWO | NO |
| 3.14 | LRL | E05IL009903 | Green River Ordnance Plant | NWO | YES |
| 3.15 | LRL | E05IL010203 | Sangamon Ordnance Plant | NWO | NO |
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| 4.1 | SPA | K06NM042401 | Fort Sumner | SPD | YES |
| 4.2 | SWF | K06TX1008 | Matagorda Peninsula Bombing Range | SPD | YES |
| 4.3 | SPL | J09CA1110 | Camp Matthews | SPD | YES |
| 4.4 | SWT | K06OK011001 | Great Salt Plains Bombing Range | SPD | YES |
| 4.5 | SPL | J09AZ057601 | Sahuarita AFR | SPD | YES |
| 4.6 | SWF | A06LA0008 | Camp Livingston | SPD | YES |
| 4.7 | SPL | J09CA707802 | Camp Lockett - Target Pit | SPD | YES |
| 4.8 | SWT | K06OK001301 | Camp Gruber | SPD | YES |
| 4.9 | SPA | K06NM005206 | Walker AFB | SPD | YES |
| 4.10 | SWF | K06TX0058 | Matagorda Island AF Range | SPD | YES |
| 4.11 | SPL | J09CA711501 | Naval Air Base - Ordnance Areas | SPD | YES |
| 4.12 | SPL | J09CA724201 | Camp Vista Army - Green Oak Ranch Small | SPD | NO |

| Task # | District | FUDS ID | FUDS Name | MM DC | Perchlorate Sampling |
|---|---|---|---|---|---|
| | | | Arms Range | | |
| 4.13 | SWF | K06TX0144 | Pyote AAF Bomb Range #1 | SPD | NO |
| 4.14 | SWF | K06TX0293 | Childress AAF Bombing Range #1 | SPD | NO |
| 4.15 | SWF | | | SPD | NO |
| 4.16 | | | | | |
| 4.17 | | | | | |
| 4.18 | | | | | |

**Design Center-Specific Requirements:**

**Huntsville Design Center Projects: Southeast and Pacific IMA Regions (Tasks 1.X)**

The contractor that is awarded the tasks/projects assigned to the Huntsville MM Design Center shall plan for an onboard review of draft programmatic work plan and the internal draft SI report at USAESCH in Huntsville, AL. This onboard review shall take place after the contractor has received comments on the draft WP and after receiving comments on the internal draft SI Report. The contract shall be expected to provide a CD of the draft version at the conclusion of the onboard review.

**Baltimore MM Design Center Projects: Northeast IMA Region (Tasks 2.X)**

The contractor that is awarded the tasks/projects assigned to the Baltimore MM Design Center shall plan for an onboard review of the draft SI report at the District office in Baltimore, MD. This onboard review shall take place after the contractor has received comments on the internal draft version.

**Omaha District Design Center Projects: Northwest IMA Region (Tasks 3.X)**

The contractor that is awarded the tasks/projects assigned to the Omaha District MM Design Center shall plan for an onboard review of the draft SI report at the District office in Omaha, NE. This onboard review shall take place after the contractor has received comments on the internal draft version.

**South Pacific Division Range Support Center Projects: Southwest IMA Region (Tasks 4.X)**

The contractor that is awarded the tasks/projects assigned to the South Pacific Division Range Support Center shall plan for an onboard review of draft programmatic work plan and the internal draft SI report at the South Pacific Division USACE Headquarters, San Francisco, Ca. This onboard review shall take place after the contractor has received comments on the draft WP and after receiving comments on the internal draft SI Report. The contract shall be expected to provide a CD of the draft version at the conclusion of the onboard review.

## 4.0 SUBMITTALS AND CORRESPONDENCE:

**Computer Files.** All final text files generated by the Contractor under this task order shall be furnished to the Contract Officer in Microsoft Word 6.0 or higher software. Spreadsheets shall be provided in Microsoft EXCEL format. All final CADD drawings shall be in Microstation 95 or higher. All GIS data shall be in ESRI (Arcview/Arcinfo) format. All chemical sampling data submittals shall be IAW DID MR 005-10 except as noted above. These documents shall be submitted on CD or DVD.

**PDF Deliverables.** In addition to the paper and digital copies of submittals, the final version of any and all reports and/or plans shall be submitted, uncompressed, on CD or DVD in PDF format along with a linked table of contents, linked tables, linked photographs, linked graphs and linked figures, all of which shall be suitable for viewing on the Internet. PDF files shall be produced from source documents wherever possible.

**Review Comments.** Various reviewers will have the opportunity to review submittals made by the Contractor under this contract. The Contractor shall review all comments received through the Technical or Project Manager/Contracting Officer and evaluate their appropriateness based upon their merit and the requirements of the PWS. The Contractor shall issue to the Project Manager a formal, annotated response to each. The Contractor shall not non-concur with a comment without discussing with the PM and/or comment maker.

**Public Affairs.** The Contractor shall not publicly disclose any data generated or reviewed under this contract. The Contractor shall refer all requests for information concerning site conditions to the subject FUDS Geographic USACE Corps of Engineers District with a copy furnished to the

Technical Manager. Reports and data generated under this contract are the property of DoD and distribution to any other source by the Contractor, unless authorized by the Contracting Officer, is prohibited.

**Submittals:** The contractor shall furnish copies of the plans, maps, and reports as identified in table below, or as specified in this PWS, to each addressee listed below in the quantities indicated.

**Document Distribution:** For the purposes of determining when documents get submitted to specific organizations, the attached document distribution table is provided.

| Document Description | HTRW CX | | MM Design Center | | District PM | | MM CX | | HQ USACE |
|---|---|---|---|---|---|---|---|---|---|
| | Hard Copy | CD Copy | Hard Copy | CD Copy | Hard Copy | CD Copy | Hard Copy | CD Copy | CD |
| CSM: | | | | | | | | | |
| Draft | 2 | | 3 | | 6 | | 2 | | |
| Working Final | 2 | | 3 | | 6 | | 2 | | 1 |
| TPP Memorandum: | | | | | | | | | |
| Draft | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | 1 |
| Final Memorandum | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | 1 |
| SI Work Plan: | | | | | | | | | |
| Draft | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | 1 |
| Final | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | 1 |
| SI Report: | | | | | | | | | |
| Draft | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | |
| Draft Final | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | 1 |
| Final | 1 | 2 | 1 | 3 | 1 | 6 | 1 | 2 | 1 |

Notes:

1. The number of final copies distributed may vary from that shown above

**Period of Performance:** *All projects are to be completed within 18 months of the award date.*

**Milestones:**

TPP Memorandum (accepted)

Work Plan (accepted)

Field Work Completed

Final SI Report (accepted)

Milestones will be considered met or completed when the appropriate QC documentation has been submitted and QA completed and the submittal and/or product is accepted.

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## 5.0 REFERENCES

5.1 Basic Contract

5.2 USACE, 2004 - HTRW Chemical Data Quality Management (CDQM) Policy for Environmental Laboratory Testing, September 30, 2004

5.3 DoD Quality Systems Manual (DoD QSM) (latest version).

5.4 USEPA, 1992 - Guidance for Performing Site Inspections under CERCLA; Interim Final, September 1992, PB92-963375, EPA 9345.1-05

5.5 EM 200-1-3, Requirements for the Preparation of Sampling and Analysis Plans

5.6 ER 1110-1-263, Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities

5.7 DOD Memorandum on Definitions Related to Munitions Response Actions, 18 December 2003, http://www.epa.gov/fedfac/pdf/MRP_Definitions_12-18-03.pdf.

5.8 Military Munitions Center of Expertise Technical Update Munitions Constituent (MC) Sampling March 2005.

5.9 OASA(I&E) Memorandum on Munitions Response Terminology, April 21, 2005

5.10 DUSD (I&E) Policy on DoD Required Actions Related to Perchlorate, January 26, 2006

5.11 EPA OSWER Assessment Guidance for Perchlorate, January 26, 2006

5.12 DoD Perchlorate Handbook, March 2006

5.13 ACSIM Memorandum: Interim Army Guidance on Perchlorate for Restoration/Cleanup Activities, May 25, 2006

## SAMPLE PUBLIC COMMENT NEWSPAPER AD

# PUBLIC NOTICE

***Name of site***

Taking into consideration various factors relating to safety and environmental hazard potential, the U.S. Army Corps of Engineers designated ***name of site*** as a Munitions Response Site for applying the Department of Defense's Munitions Response Site Prioritization Protocol.

DoD conducted live-fire training and testing of weapon systems at active and former military installations throughout the United States to ensure force readiness and defend our nation. While DoD has made great progress in addressing the potential hazards associated with former munitions-related activities, much remains to be done. Through direction provided by Congress, DoD developed a model that assigns priorities to defense sites containing unexploded ordnance, discarded military munitions or munitions constituents.

***One sentence that describes what took place at this site (i.e. chemical warfare training, live-fire, testing, etc.).*** The U.S. Army Corps of Engineers has recently completed a site inspection at ***name of site*** and evaluated it using the prioritization model. The evaluation criteria, including types of munitions that may be present, ease of access to the site and number of people living near the site, are available for public review at ***district Web site*** and ***name of information repository.***

If you have additional information about ***name of site*** please send it to: U.S. Army Corps of Engineers, ***name of district***, Public Affairs Office, ***address*** or email to ***email address for PAO***.

For more information, please contact the U.S. Army Corps of Engineers, ***name of district***. Public Affairs Office at ***phone number***.

SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by $1,212,109.00 from $7,051,591.53 to $8,263,700.53.

CLIN 0008:

CS: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 9L4D96 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN CS has been added.

CT: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 L4JD47 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN CT has been added.

CU: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 92D9K0 was increased by $6,721.00 from $0.00 to $6,721.00
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CV: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 607BG5 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN CV has been added.

CW: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 1FB51L was increased by $6,721.00 from $0.00 to $6,721.00
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CX: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 9F300K was increased by $6,721.00 from $0.00 to $6,721.00
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CY: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 72K0L4 was increased by $6,721.00 from $0.00 to $6,721.00
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CZ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 3D7KBB was increased by $6,721.00 from $0.00 to $6,721.00
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DB: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 4LHFFJ was increased by $6,721.00 from $0.00 to $6,721.00
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DC: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 H8H6D7 was increased by $6,721.00 from $0.00 to $6,721.00
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DD: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 9GG8K9 was increased by $6,721.00 from $0.00 to $6,721.00
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DE: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 GLHL60 was increased by $6,721.00 from $0.00 to $6,721.00
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DF: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 0DB05F was increased by $6,721.00 from $0.00 to $6,721.00
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DG: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 41DBDG was increased by $6,721.00 from $0.00 to $6,721.00
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DH: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 7H12CD was increased by $6,721.00 from $0.00 to $6,721.00
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DJ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 D93881 was increased by $6,721.00 from $0.00 to $6,721.00
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DK: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 C2B331 was increased by $6,721.00 from $0.00 to $6,721.00
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DL: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 B1J839 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DL has been added.

DM: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 D5DD53 was increased by $6,721.00 from $0.00 to $6,721.00
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DN: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 H1203K was increased by $6,721.00 from $0.00 to $6,721.00
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DP: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 KF76K9 was increased by $6,721.00 from $0.00 to $6,721.00
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DQ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 06BG23 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DQ has been added.

DR: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 C87G9L was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DR has been added.

DS: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 2139H4 was increased by $6,721.00 from $0.00 to $6,721.00

The contract ACRN DS has been added.

DT: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 J683GK was increased by $6,721.00 from $0.00 to $6,721.00
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DU: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 6F055C was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DU has been added.

DV: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 8J2D8L was increased by $6,721.00 from $0.00 to $6,721.00
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DW: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 46H2FL was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DW has been added.

DX: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 K1L26J was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DX has been added.

DY: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 12F88B was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DY has been added.

DZ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 32GJ3K was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN DZ has been added.

EA: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 J58C47 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EA has been added.

EB: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 31GLD6 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EB has been added.

EC: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 C64120 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EC has been added.

ED: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 8H80KH was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN ED has been added.

EE: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 7H33HK was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EE has been added.

EF: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 K73G68 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EF has been added.

EG: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 KB03L2 was increased by $6,721.00

from $0.00 to $6,721.00
The contract ACRN EG has been added.

EH: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 F7H91G was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EH has been added.

EJ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 G831CJ was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EJ has been added.

EK: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 9K5G1L was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EK has been added.

EL: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 3L2J39 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EL has been added.

EM: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 3B9K34 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EM has been added.

EN: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 GK27D1 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EN has been added.

EP: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 D51KF1 was increased by $6,721.00 from $0.00 to $6,721.00
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EQ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 03CF6G was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EQ has been added.

ER: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 9B1LK9 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN ER has been added.

ES: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 452B6D was increased by $6,721.00 from $0.00 to $6,721.00
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ET: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 75H962 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN ET has been added.

EU: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 JD0KD0 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EU has been added.

EV: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 18114K was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EV has been added.

EW: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 D9K38L was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EW has been added.

EX: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 081K5K was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EX has been added.

EY: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 J88B1F was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EY has been added.

EZ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 D4GJL5 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN EZ has been added.

FA: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 L7K3K4 was increased by $6,721.00 from $0.00 to $6,721.00
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FB: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 9D6B16 was increased by $6,721.00 from $0.00 to $6,721.00
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FC: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 6B1L69 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN FC has been added.

FD: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 325GD3 was increased by $6,721.00 from $0.00 to $6,721.00
The contract ACRN FD has been added.

FE: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 1K8FLG was increased by $163,350.00 from $0.00 to $163,350.00
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FF: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 14B53C was increased by $150,346.50 from $0.00 to $150,346.50
The contract ACRN FF has been added.

FG: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 75C2KJ was increased by $150,346.50 from $0.00 to $150,346.50
The contract ACRN FG has been added.

FH: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 F015FC was increased by $154,035.00 from $0.00 to $154,035.00
The contract ACRN FH has been added.

FJ: 21 NA 2006 2020.0000 A0 2006 08 8130 49300821000 01110 3230 D52172 was increased by $190,771.00 from $0.00 to $190,771.00
The contract ACRN FJ has been added.

(End of Summary of Changes)

# Appendix A
# Site Inspection Report Outline
# 21 November 2006

TABLE OF ACRONYMS

GLOSSARY OF TERMS

Table of Contents (Government will provide example table of contents but allows for flexibility in the TOC)

EXECUTIVE SUMMARY

- Brief 1-2 page summary
- Include a table summarizing findings by MRA/MRS.
- Include small paragraph summarizing recommendations.

1.0 INTRODUCTION

- State that an SI was performed, the name of the agency performing it, and the authority under which it was conducted (authority language provided below):

  The Department of Defense (DoD) has established the Military Munitions Response Program (MMRP) to address DoD sites suspected of containing munitions and explosives of concern (MEC) or munitions constituents (MC). Under the MMRP, the U.S. Army Corps of Engineers (USACE) is conducting environmental response activities at formerly used defense sites (FUDS) for the Army, DoD's Executive Agent for the FUDS program.

  Pursuant to USACE's Engineer Regulation (ER) 200-3-1 (USACE, 10 May 2004) and the Management Guidance for the Defense Environmental Response Program (DERP) (Office of the Deputy Under Secretary of Defense (Installations and Environment), September 2001), USACE is conducting FUDS response activities in accordance with the DERP statute (10 USC 2701 et seq.), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC §9601 et seq.), Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300). As such, USACE is conducting remedial site inspections (SI), as set forth in the NCP, to evaluate hazardous substance releases or threatened releases from eligible FUDS.

  While not all MEC/MC constitute CERCLA hazardous substances, pollutants or contaminants, the DERP statute provides DOD the authority to respond to releases of MEC/MC, and DOD policy states that such responses shall be conducted in accordance with CERCLA and the NCP.

- State the FUDS property name, FUDS property and project numbers, and location (street address, city, county, State, latitude/longitude coordinates). If necessary, provide brief directions to the property.
- State the purpose, scope, and objectives of the SI (standard language provided below):

  The primary objective of the MMRP SI is to determine whether a FUDS project warrants further response action under CERCLA or not. The SI collects the minimum amount of information necessary to make this determination, as well as it (i) determines the potential need for a removal action (ii) collects or develops additional data, as appropriate, for Hazard Ranking System (HRS) scoring by Environmental Protection Agency (EPA); and (iii) collects data, as appropriate, to characterize the release for effective and rapid initiation of the Remedial Investigation and Feasibility Study (RI/FS). An additional objective of the MMRP SI is to collect the additional data necessary to ~~(i)~~ complete the Munitions Response Site Prioritization Protocol (MRSPP).

# Appendix A
# Site Inspection Report Outline
# 21 November 2006

2.0 PROPERTY DESCRIPTION AND HISTORY

- Identify and describe historic military operations (e.g., munitions manufacturing plant, Air Force or Navy base, Army WWII training camp, etc.) at the FUDS property, as well as the individual MRAs (e.g., mortar range, artillery range, open burning/open detonation area, burial pit, etc.)/MRSs identified.
    - Identify former owners and operators, years of operation, types of MEC and MC used and thought to be present, any MEC or MC treatment or disposal practices, containment features, if present, and quantities of MEC or MC used and thought to be present, if known or possible to estimate. Identify current owners and operators and current land use.
    - Describe the area's physical setting (e.g., topography, climate, vegetation, and significant structures). Describe accessibility to MEC and MC and current institutional controls (e.g., fencing, signage, etc.). Briefly describe surrounding land uses and identify nearby populations.
- Include the appropriate portion of a USGS 7.5-minute topographic map locating the project and surrounding area. On the map, identify nearby surface water bodies and the nearest groundwater and drinking water wells, drinking water intake, residence, wetlands, and other sensitive environments, as applicable.
- If applicable, provide the dates, scopes, and general results of previous investigations for MEC and MC, including previous records reviews (Archives Search Reports (ASR) and results of subsequent range inventory (ASR supplement)) and any investigations conducted under USACE's hazardous, toxic, and radioactive waste (HTRW) program related to MC.
- If applicable, describe other land use that may have contributed to contamination, as well as regulatory history, if applicable, including RCRA status, permits, permit violations, and inspections by local, State, or Federal authorities.
- Discuss any occurrences of MEC found by citizens and any accidents, injuries, chemical exposures, or complaints.

3.0 SI TASKS

- Include a summary of agreements made in the first Technical Project Planning (TPP) session and contacts made with the State Historical Preservation Office, U.S. Fish and Wildlife Service, or other agencies coordinated with on cultural and natural resources considerations.
- Describe the results of any additional desk-top research or interviews conducted as part of the SI, by MRA, as applicable.

4.0 MEC Findings

- Summarize, by MRA, the investigative activities conducted for MEC and the results. Present data quality objectives (DQOs) of the SI and discuss whether they were satisfied.
    - Identify specific MEC items found, wherever possible, and list them in a table, describing the results of the qualitative reconnaissance, as well as any geophysical studies, spatial analysis, aerial surveys, and footprint analysis (i.e., identification of MRA boundaries), if conducted. Include a map of the results of the reconnaissance inspections.
    - Summarize previous MEC findings in a table. Include a map of MEC finds, and add locations to the CSM, or refer to a map in a previous report.

5.0 MIGRATION/EXPOSURE PATHWAYS AND TARGETS

# Appendix A
# Site Inspection Report Outline
# 21 November 2006

GROUND WATER MIGRATION PATHWAY

- Describe the local geologic and hydrogeologic setting and features, (including the stratigraphy, geologic formations, aquifers, karst features, confining layers, and depth to each aquifer. Provide a description of the underlying unit with the lowest hydraulic conductivity, including its thickness. (Do not consider units within the first 10 feet below ground surface.)
- Discuss ground water use within a 4-mile radius of the MRAs. Identify the nearest private and municipal drinking water wells, including standby wells used at least once a year. Provide the number of wells, their locations, pumping rates, and the aquifer from which water is drawn. Identify wells in karst aquifers. Quantify drinking water populations served by wells within 4 miles, breaking out populations into the following distance categories: 0-1/4; >1/4-1/2; >1/2-1; >1-2; >2-3; and >3-4 miles, including residents, students, and workers. Identify any municipal wells that are part of a blended system (ground water mixed with surface water), and provide the relative amount the wells contribute to the system. [Note: Where more than one MRSs have been identified, measure the distance to ground water targets from them, as opposed to the MRA.]
- Indicate whether ground water within a 4-mile radius of the MRAs is used for any of the following purposes: irrigation (5-acre minimum) of commercial food or forage crops; watering of commercial livestock; ingredient in commercial food preparation; supply for commercial aquaculture; or supply for a major or designated water recreation area. If there are no drinking water wells, indicate whether aquifers are usable for drinking water purposes.
- Identify designated Wellhead Protection Areas (pursuant to Section 1428 of the Safe Drinking Water Act) and specify location.
- Note: Some of the information listed above may already have been collected during the preliminary assessment (PA), and if so, may be summarized from the PA. If not, the contractor may choose to utilize companies that specialize in providing or compiling environmental data to parties involved in real estate transactions.
- Discuss any previous ground water sampling results (analyzed for MC); provide dates of sampling events, well locations, and the depths and names of sampled aquifers. Summarize analytical results in a table and include sampling locations in the CSM in Appendix J or refer to a map in a previous report.
- List in a table each well or spring sampled during the SI, provide the depth from which it draws drinking water and the screened interval, quantify the population served by the well, if applicable, and identify its distance from the MRAs. Discuss SI ground water sampling results in terms of attribution of hazardous substances to DoD activities and comparison to background concentrations, as applicable. List in a table each sample and summarize analytical results. Include a map of sampling locations ~~or~~ Identify drinking water wells exposed to hazardous substances, if present, and quantify the populations served by those wells, as applicable. If no groundwater samples were taken, explain. For example, sampling may not be supported by the CSM (no complete exposure route exists or no receptors are present), or it was decided in the TPP session that soil/sediment/surface water, etc. would be the focus of the SI because the project was already identified as requiring an RI/FS, and groundwater contamination could more effectively be addressed at that phase.

SURFACE WATER MIGRATION PATHWAY

- Describe the local hydrologic setting, including MRA location with respect to the nearest surface water bodies and potentially affected floodplains. Include a figure depicting surface water features and targets (fisheries, wetlands, etc.) Describe the overland and in-water segments of the surface water migration path, starting at the perimeter of the MRA and ending 15 miles downstream of the probable point of entry (PPE) of MEC/MC into surface water. Identify all water bodies within the

in-water segment, and state the length of reach and flow or depth characteristics of each. Describe any tidal influence along the surface water migration path. Note: surface water includes perennially flowing man-made ditches as well as intermittently flowing ditches in areas with <20 inches of mean annual precipitation. For lakes, oceans, coastal tidal waters, and the Great Lakes, apply the 15-mile target distance limit as an arc. [Note: Where more than one MRSs have been identified, measure the distance to all surface water targets from them, not the MRAs.]

- Add the surface water migration path to the CSM in Appendix J. Describe upgradient drainage areas (including predominant soil type), onsite drainage (including storm drains, ditches, culverts, etc.), discharges into surface water, and pertinent historical events, including floods, fish kills, and fishery closures.
- Indicate whether surface water within the 15-mile target distance limit supplies drinking water. Identify the location and state the distance from the PPE to each drinking water intake. Quantify the population served by the intake; identify blended systems (where surface water is mixed with ground water) and provide the relative amount that surface water contributes.
- Indicate whether surface water within the target distance limit contains recreational, subsistence, or commercial fisheries. Identify and state the distance from the PPE to each fishery; briefly characterize each.
- Identify sensitive environments present within or adjacent to the in-water segment. Include all sensitive environments listed in Attachment 2 of the USACE guidance entitled "Screening Level Ecological Risk Assessments for MMRP SIs" (Army checklist for important ecological places). State the distance from the PPE to each sensitive environment. In addition, quantify the length of wetlands frontage along the surface water migration path within the following mileage categories downstream of the PPE: <0.1, 0.1-1, >1-2, >2-3, >3-4, >4-8, >8-12, >12-16, >16-20, >20 miles.
- Note: Some of the information listed above may already have been collected during the PA, and if so, may be summarized from the PA. If not, the contractor may choose to utilize companies that specialize in providing or compiling environmental data to parties involved in real estate transactions.
- Discuss any previous surface water and/or sediment sampling results (analyzed for MC), including dates, locations, and types of samples. Summarize analytical results in a table and include sampling locations in the CSM in Appendix J or refer to a map in a previous report.
- Discuss SI surface water and sediment sampling results. List in a table each sample and summarize analytical results. Identify surface water intakes, fisheries, and sensitive environments exposed to hazardous substances, if present at concentrations significantly above background; quantify the affected drinking water populations and fisheries (in pounds per year) and describe the exposed sensitive environments, including wetlands frontage, as applicable. If no surface water or sediment samples were collected, explain. For example, sampling may not be supported by the CSM (no complete exposure route exists or no receptors are present). Alternatively, surface water may not have been present to allow collection of a sample..

SOIL EXPOSURE PATHWAY

- Discuss any previous observations and sampling results of surface MEC or MC, including dates and locations. Summarize analytical results in a table and include sampling locations in the CSM in Appendix J or refer to a map in a previous report.
- Discuss SI surface soil samples. List each sample in a table and summarize analytical results. If soil samples were not collected, explain. For example, sampling may not be supported by the CSM (e.g., no surface soil sampling was planned for the FUDS because range activities were limited to the use of practice bombs with spotting charges. If field reconnaissance identified MEC debris associated with MEC other than practice bombs, the need for MC sampling was reassessed in the field).

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- State the number of workers, residents, and students present on and within 200 feet of areas of observed surface contamination (hazardous substances within top 2 feet of surface soil) and identify the locations of the pertinent workplaces, schools, day care facilities, and homes. If there are no workers, residents, or students on or within 200 feet of observed contamination, state the shortest travel distance within 1 mile to any residence or school (accounting for natural barriers to travel on foot).
- State the number of people who live or attend school within 1 mile travel distance of areas of observed contamination, within the following distance categories: >0-1/4, >1/4-1/2, >1/2-1 mile. (Do not include those counted on or within 200 feet of area of observed contamination, as above.)
- Indicate whether any of the following terrestrial sensitive environments exist in the area of observed contamination:
  - Terrestrial critical habitat for Federal designated endangered or threatened species; National Park; designated Federal Wilderness Area; National Monument
  - Terrestrial habitat known to be used by Federal designated or proposed endangered or threatened species; National Preserve (terrestrial); National or State Terrestrial Wildlife Refuge; Federal land designated for protection of natural ecosystems; administratively proposed Federal Wilderness Area; terrestrial areas utilized for breeding by large or dense aggregations of animals
  - Terrestrial habitat known to be used by State designated endangered or threatened species; terrestrial habitat known to be used by species under review as to its Federal status
  - State land designated for wildlife or game mgmt; State designated Natural Areas; particular areas, relatively small in size important to maintenance of unique biotic communities
- Describe how attractive/accessible the area of observed contamination is for public use, indicating whether the area is: designated for recreational use; area is regularly used for public recreation; accessible and uniquely used for recreation (e.g., vacant lots in urban areas); moderately accessible (e.g., some access improvements, such as gravel road) with some public recreation use; slightly accessible (e.g., rural area with no road improvement) with some public recreation use; accessible, with no public recreation use; physically inaccessible to the public, with no evidence of public recreation use.

AIR MIGRATION PATHWAY

- Identify for each MRA the potential for release of contaminated particulate to the air and conditions that may prevent release (area is covered by liquids, uncontaminated soil cover, or thick vegetation, or area is surrounded by windbreak, or source is totally enclosed in intact building or containers.) Describe the results of any air samples, if collected. If air samples were not collected, explain. For example, no air samples were collected because there are no known sources of air contamination associated with the historic DoD operations; Surface soil may present a source of particulate contamination; therefore surface soil samples were collected during the SI, as applicable). Discuss any previous observations of air releases or air sampling results, including dates, locations, sampling procedures, and meteorological conditions.
- Identify the location of and distance to the nearest resident, worker, or student within 1 mile of the source of particulate contamination.
- State the population within 4 miles of the sources of particulate contamination, including residents, students, and workers, broken out into the following distance categories: on a source; >0-1/4, >1/4-1/2, >1/2-1, >1-2, >2-3, >3-4 miles.
- Indicate all types of sensitive environments, using those listed in Attachment 2 of the USACE guidance entitled "Screening Level Ecological Risk Assessments for MMRP SIs" (Army checklist for important ecological places), within 4 miles of the source of particulate contamination, broken out into the same distance categories listed above for human populations.

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- Indicate the total acres of wetlands within 4 miles of the source of particulate contamination, broken out into the same distance categories listed above for human populations

- For results of the MC investigation, summarize the number and type of samples collected in each MRA, including background samples, and identify specific hazardous substances, if detected. Describe observations made at each sampling location (presence of MEC, MEC scrap, MC bulk material, targets, craters, proximity of known or suspected MEC items, stressed vegetation, and nature of sample material if unusual characteristics are noted (e.g., high turbidity, discoloration, high organic matter content). List in a table each environmental sample collected and summarize analytical results. Include a map of sampling locations.

6.0 SCREENING-LEVEL RISK ASSESSMENT

- Provide discussion of risk from MEC. (i.e. likelihood of removing MEC from its original location, accessibility, detonation on contact, etc.). State whether or not it is believed that MEC may be present and why. Summarize the attributes of the potential MEC (type, how it functions, and potential hazard) Describe the potential receptors and how they may interact with the MEC. {Describe the potential hazards from potential MEC. Presence of MEC and any potential human receptors is normally sufficient to justify an RI/FS. More detailed explanation of hazards will be required to justify NDAI (if there is a potential MEC presence), TCRA, or NTCRA.}
- Provide sub-sections entitled "Screening Level Human Health Risk Assessment (HHRA)" and "Screening-Level Ecological Risk Assessment (ERA)." Discuss the conservative evaluation of the potential for adverse effects to human health and the environment due to MC contamination. This information is used to make recommendations for areas that do not pose a significant threat from MC, those that require further investigation, and those that may require a removal action. The HHRA will compare exposure point concentrations (highest detection or 95% upper confidence limit (UCL) if sufficient data exists) to health-based screening levels and will be consistent with USACE's Risk Assessment Handbook Vol. I: Human Health Evaluation (EM 200-1-4). The ERA shall be consistent with Steps 1 and 2 of the U.S. EPA guidance, Ecological Risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting Ecological Risk Assessments.
- All complete pathways shown in the CSM (Appendix J) shall be addressed in this section.
    - Human
    - Ecological
    - MEC

7.0 SUMMARY AND CONCLUSIONS

- Briefly summarize the major aspects of the FUDS property, the MRAs (and the MRSs), and their histories that relate to the release or threatened release of MEC or MC and the exposure of human and ecological target populations. Briefly summarize principal migration pathways and targets of concern. [Note: Where MRSs have been identified, provide a summary for each.]
- Summarize sampling results, including MEC and MC found and detected in the MRAs as well as within the migration pathways.

8.0 RECOMMENDATIONS

- Summarize recommendations for further remedial response (RI/FS), removal response, or No Department of Defense (DoD) Action Indicated. Provide recommendations and the basis for these recommendations (from MEC and MC results) in tabular format

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9.0 REFERENCES

- List, in bibliographic citation format, all references cited in the SI report.

APPENDICES

A. Performance Work Statement – Electronic Only
B. Technical Project Planning (TPP) Session Documentation/Meeting Minutes – Electronic Only
C. Interview Documentation (pertinent teleconferences regarding site history or conditions; coordination on cultural and natural resources considerations)
D. Field Notes and Field Forms
E. Photodocumentation Log (As an attachment, provide photographs taken during the SI depicting pertinent observations such as MEC and MC source areas, containment conditions, stained soil, stressed vegetation, drainage routes, sample locations, and any MEC or munitions debris findings. Describe each photograph in captions or accompanying text. Key each photo to its location on the site sketch or CSM)
F. Analytical Data – Electronic Only, should include SEDD files and laboratory reports in pdf. – for all versions (Draft, Draft-Final, and Final) of the report
G. Analytical Data QA/QC Report, to include all requirements from DID MR005-10 for Chemical Data Final Report that are not addressed elsewhere and the USACE-prepared Chemical Quality Assurance Report (CQAR)
H. Geographic Information Systems Data – Electronic Only
I. Geophysical Data, if applicable. (All raw and processed geophysical data and geophysical maps in their native format (Surfer, Geosoft Oasis montaj, Intergraph, or ESRI ArcView format) and/or as raster bit-map images such as BMP, JPEG, TIF, or GIF.) – Electronic Only; Maps hardcopy also.
J. Conceptual Site Model
K. Munitions Response Site Prioritization Protocol Evaluations (for each MRS)
    - The protocol is being applied at the MRS level, because individual MRSs are to be delineated. For purposes of applying the Protocol herein, usually the MRS equals one MRA. [Note: Where MRSs have been identified and there is more than one MRS in the MRA apply the Protocol to individual MRSs, ensuring the total acreage adds up to the MRA acreage.]
    - Directions section of the MRSPP sheets shall contain specific references and critical information used to develop the score for that particular table in the MRSPP.
    - Do not use bolding to show selection. Use boxes or circles to show selection.
    - Recommend printing the Table 20 rather than all the CWM tables for the printed copy. The other CWM tables provide no information if there's no known or suspected hazard.
    - Include site name, FUDS Project ID, MRS identifier, and Appendix Pg # to each page. If the site is in the Range Inventory (i.e., has a number in the ASR Supplement), the Range Inventory designation/name should be included. Similarly, if there is an ARC number (see http://deparc.egovservices.net/deparc/do/home), it should be included.
    - Need to provide guidance on what to do if no media sampled (no hazard or just leave blank)
    - Table 9 (cultural and eco) shouldn't just refer to the ASR, but also the SI report, which presumably acquired more current and complete information than the ASR.
    - Per the current draft (and all preceding drafts) of the Primer, "All contaminants of concern attributable to an MRS should be included. Naturally occurring compounds that are detected within established background concentration ranges are not included." Given that the contractor collected background (or "ambient") samples, it is unreasonable to include every detected metal in these worksheets.
L. Reference Copies: Attach copies of communication records and other references gathered for additional HRS and MRSPP data (e.g., records of teleconferences with local water or county health departments on groundwater use; references for locating sensitive environments and population densities). Any site specific documents/reports used to formulate your recommendation (include other pertinent reference materials generated during the SI that are not otherwise cited or included in the

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Appendices. (e.g. Copies of previously issued reports, ASRs, other investigation reports (i.e. ATSDR, CDC, DHHS), etc) in electronic copy only. Include hard copies only of things produced as part of the SI effort (contact records, etc.) and critical excerpts from reference documents.

# APPENDIX B

## TPP Session Documentation/Meeting Minutes
## Electronic Only

US Army Corps of Engineers ®
Jacksonville District

US Army Corps of Engineers ®
Huntsville, US Army Engineering and Support Center

# Technical Project Planning Memo:

**Subject:** Formerly Used Defense Site (FUDS) Military Munitions Response Program (MMRP) Documentation of Technical Project Planning (TPP) Team Concurrence for Site Inspection Phase

**Site:** **Leesburg Air Service Center, I04FL014301, Sumter County, Florida**

This document provides a record of the TPP Meeting for the Leesburg Air Service Center FUDS. The TPP Team members listed below indicated concurrence with the Site Inspection (SI) Technical Approach as developed during the TPP Meeting held at the Wildwood City Hall in Sumter County, Florida, on January 6, 2011. An initial Technical Approach (as presented) was developed using the collaborative experience of Parsons Infrastructure and Technology Group (Parsons) and U.S. Army Corps of Engineers (USACE) technical experts in conjunction with available site information including the Inventory Project Report (INPR), INPR Supplement, Historical Records Review (HRR), and other pertinent documents. The TPP Team discussed and refined the initial Technical Approach during the course of the TPP Meeting yielding a final Technical Approach for implementation at the two munitions response sites (MRS) associated with the FUDS. The Final Technical Approach agreed upon by the TPP Team is documented herein and will be further detailed in the forthcoming Draft Site-Specific Work Plan (SS-WP) Addendum (an addendum to the Programmatic Work Plan [PWP]). The Draft SS-WP Addendum will be submitted to the TPP Team members for review to ensure that the key aspects of the TPP Meeting resolutions are fully captured.

Beginning November 1, 1942, construction began on Orange Home Tent Camp and was completed on approximately May 1, 1943. The FUDS was further developed and later renamed Leesburg Air Service Center. The main mission of the Leesburg Air Service Center was use as a satellite of the Army Air Forces School of Applied Tactics (AAFSAT). Beginning on October 27, 1942, the Army Air Forces (AAF) activated the AAFSAT at Orlando, FL to develop new tactics and train personnel in their use. AAFSAT was a post-graduate, or finishing facility for students who completed courses elsewhere. AAFSAT was not solely directed at pilots and crews, but all elements of the AAF preparing to serve in a combat theatre. Although located at Orlando Air Base, AAFSAT was the Command headquarters and oversaw dozens of installations including the Leesburg Air Service Center.

Over the course of developing Leesburg Air Service Center, the federal government acquired 2,232 acres of land by lease and condemnation between 1942 and 1945 for an AAF tent camp, rifle range, and ordnance area. The site was used to support personnel performing third echelon maintenance and supply for the outlying airdromes in west-

central Florida. The site consisted predominantly of vacant land; however, known site improvements included grading, fencing, and 1,125 tents. The AAF determined that the property was excess to their needs on March 8, 1945, and declared it surplus. Between May 14, 1945, and April 10, 1946, the War Department terminated the leases and relinquished the property to the then current owners.

Currently, portions of the property are owned by the county of Sumter and various private individuals and corporations. Approximately a quarter of the property is utilized for residential purposes, orange groves, a public park, and a boat ramp. The remainder of the FUDS property is timberland or unimproved. There is no evidence of former military structures except for a building formerly used as a barracks which is now the Heartland Christian Church.

The FUDS Management Information System (FUDSMIS) summary reports the site has a 300 Yard Known Distance Rifle Range (with Pistol Range) and a Hand Grenade Court for use with conventional munitions. Potential munitions associated with the Leesburg ASC ranges are .22, .30, .38, and .45 Calibers (300 Yard Rifle Range MRS) and practice and/or high-explosive hand grenades (Hand Grenade Court MRS). There have not been any munitions related incidents reported since site closure.

Based on Parsons' understanding of the Leesburg Air Service Center FUDS as noted in the 2010 HRR, the 300 Yard Known Distance Rifle Range MRS is anticipated to proceed to a ***No Department of Defense Action Indicated (NDAI) designation***. The Hand Grenade Court MRS is expected to be ***a possible Remedial Investigation/Feasibility Study (RI/FS) site***. Exposure pathways are possibly complete due to the potential for remaining munitions and explosives of concern (MEC) and/or munitions constituents (MC) contamination and a lack of complete access restrictions. Therefore, in accordance with Engineer Regulation (ER) 200-3-1, sufficient data will need to be collected during the SI to evaluate the potential presence of MEC and MC for effective initiation of an NDAI or RI/FS, if necessary. In addition, the data necessary for the United States Environmental Protection Agency (USEPA) to complete the Hazard Ranking System (HRS) scoring and for completion of the Munitions Response Site Prioritization Protocol (MRSPP) will be collected and developed.

To accomplish the primary SI project objectives (possible NDAI for the Rifle Range MRS and possible RI/FS for the Hand Grenade Court MRS), the TPP Team agreed that the SI data collection efforts will focus on the placement of MC sampling locations in and around areas that represent the highest likelihood for the presence of MC contamination. Surface soil is the primary exposure medium at the MRS; however, surface water and sediment may be sampled depending on site conditions. The site visit will implement the use of magnetometers, global positioning systems (GPS), Geographic Information System (GIS) data loggers, and digital photography in an integrated format. The MC sampling field effort will be performed in a manner that minimizes any intrusion on property owner activities and special interests. Procedural details of the field work will be provided in a Draft SS-WP Addendum for stakeholder review and comment. The U.S. Army Corps of Engineers, Jacksonville District (CESAJ) will coordinate the efforts, as applicable.

In addition to TPP Team determinations stated above, the following issues and resolutions are noted:

- The TPP Team concurred with the Technical Approach (supporting a potential NDAI recommendation for the Rifle Range and RI/FS for the Grenade Court) as presented and refined at the TPP Meeting on January 6, 2011.
- Mr. Robert Smith, City of Wildwood, stated that development was slated for the area in the vicinity of the MRSs. County Road 468 is expected to be expanded to four lanes. Currently, the Southern Oaks Industrial Park is going through the Development of Regional Impact (DRI) process. The DRI has reported potential archeological sites in the area near County Road 468 and the Sumter/Lake County line. Mr. Smith offered to supply Parsons with the DRI report. Ms. Peavy (City of Wildwood) stated she could supply Parsons with the DRI report.
    - On 06 January 2011, Ms. Peavy provided Parsons with a copy of the Southern Oaks DRI Map H – Master Development Plan (see Figure 4) and the contact information for the property owner/developer and the Withlacoochee Regional Planning Council.
- Mr. Smith stated that there are two property owners for this site, Bailey Brothers Inc. and Daryl Carter (Trustee), in addition to some county right-of-way property.
    - Review of Sumter County parcel maps indicates that Bailey Brothers Inc. is the property owner in the area of interest to this SI.
- Mr. Nuzie, FDEP, asked if the berm was still on-site. Parsons responded that the berm was still visible in 1964 aerials, but not visible in more recent aerials. It is possible, however, that the site is overgrown and the berm is still in place but not visible from the air.
- Parsons asked if anyone knew the discharge location for the retention pond on-site (located at the 100 yard firing point). Mr. Cottrell, Sumter County, said he would check the drainage plans and let us know.
- Springstead Engineering is the contractor who handled the road widening project. Mr. Cottrell stated that he would find out if there are aerial photos available from the road widening project.
    - Mr. Cottrell provided Parsons with the construction blueprints for the road-widening project on County Road 468. A drainage line and catchment basin were installed during the roadway expansion (see Figure 5). Construction of the drainage line and catchment basin may have impacted areas within the MRSs where Parsons has proposed samples. Parsons will take this construction into account and move the proposed samples, as appropriate, during creation of the Draft SS-WP Addendum.
- Mr. Nuzie stated that if the rifle range target berm is 100 yards long, more samples should be collected. Parsons agreed to add or move samples to the berm area, as appropriate, based on actual site conditions.

- Ms. Terry, USACE Huntsville, suggested that some metals analysis, and possibly perchlorate, may be needed for the grenade court samples (currently only explosives analysis is proposed). Mr. Nuzie agreed, especially regarding the possibility of iron being a MC. Parsons agreed to research the potential MC from fragmentation grenades further and add select metals to the analysis list if appropriate.
    - Parsons has investigated the compounds associated with the fragmentation grenades. Approximately, 80% of the munitions weight is composed of iron. An additional 10% of the munitions weight is zinc. Both iron and zinc will be sampled at the Hand Grenade Court MRS. Perchlorate is not a component of either the practice or fragmentation grenades used at this range.
- Mr. Nuzie stated that information should be documented thoroughly to support the no groundwater sampling decision. Additional information regarding groundwater in the vicinity of the MRSs will be provided in the Draft SS-WP Addendum.
- Twelve biased surface soil samples are proposed to be collected within the 300 Yard Known Distance Rifle Range. Two samples will be collected at each of the three firing points and a minimum of six samples will be collected at the berm. Four surface soil samples are proposed to be collected within the Hand Grenade Court MRS. Three ambient soil samples will be collected outside the MRSs for use in the MRSPP scoring. Four discretionary surface water/sediment sample couples are proposed at the site and will be collected based on site conditions. The surface water/sediment sample couple locations will be located downgradient of the former firing points/impact berm and grenade court. If surface water and sediment samples are collected, two ambient surface water/sediment couples will be collected outside and upgradient of the MRSs for use in the MRSPP. The surface water in the area is interpreted to be representative of the local groundwater and the proposed surface water sampling will address any potential groundwater contamination issues.
    - No groundwater sampling is planned at this time. There are no reported wells within either MRS. Depth to the water table is shallow (approximately 5 feet) in the northern part of the FUDS, therefore, surface water sampling is expected to be representative of groundwater. More information on groundwater conditions will be provided in the upcoming SS-WP Addendum.

The meeting adjourned at the conclusion of the presentations and questions.

A “windshield tour” was conducted immediately following the meeting. The team parked on the east side of County Road 468 adjacent to the Hand Grenade Court MRS. A barbed wire fence was located at the edge of the road. Portions of the land are clear and cattle were observed grazing in the area. No evidence of the firing points, berm, or grenade court were observed; however, a clear view was obstructed by trees and vegetation. The

team noted that evidence of construction surveying was present within the MRSs, but interpreted the flagging as leftover from previous roadway construction on County Road 468.

The SI Technical Approach described above will not be modified without consultation and agreement by the TPP Team whose names appear below.

**Mr. William Spence**
**CESAJ**
**Project Manager**

**Ms. Paula Henderson**
**USAESCH**
**Project Manager**

**Ms. Kelly VanSandt**
**USAESCH**
**Technical Lead**

**Mr. Eric Nuzie**
**FDEP**

**Ms. Becky Terry**
**USAESCH**
**Project Manager**

**Mr. Robert Smith**
**City Manager - Wildwood**

**Mr. Scott Cottrel**
**Sumter County Public Works**

**Ms. Kathy Rowland**
**Parsons**

**Mr. Tim Davis**
**Parsons**

| TPP Team | EM 200-1-2, Paragraph 1.1.1 | |
|---|---|---|
| **Decision Makers** | | |
| **Customer** | USACE Jacksonville District (CESAJ) | |
| **Project Manager** | Bill Spence, CESAJ | |
| **Regulators** | Florida Department of Environmental Protection | |
| **Primary Stakeholders** | Private and commercial land owners | |
| **Data Types** | | **Data Gatherer** |
| **Demographics/Land Use** | Risk, Responsibility, and Compliance Perspectives | Parsons (Senior Scientist) |
| **Site Conditions** | Remedy Perspective | Parsons (Geologist, Senior Scientist) |
| **Munitions and Explosives of Concern (MEC)** | Risk and Remedy Perspectives | Parsons (UXO Technician III or higher, Risk Specialist, Senior Scientist) |
| **Munitions Constituents (MC)** | Risk and Remedy Perspectives | Parsons (Chemist, Risk Specialist, Senior Scientist) |
| **Archaeology** | Compliance and Remedy Perspectives | CESAJ, Parsons (Staff Scientist, Senior Scientist) |
| **Endangered Species** | Risk and Compliance Perspectives | CESAJ, Parsons (Staff Scientist, Senior Scientist) |

| **(c) For example, Meeting with Customer/stakeholder/Regulator, State Regulation____,** | | | |
|---|---|---|---|
| (d) Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3. | **Contaminant Issues** | **Future Land Use** | **Site-specific Closeout Goal (if applicable)** |
| 300 Yard Known Distance Rifle Range MRS01 | MEC / MC | Undeveloped land / cattle pasture land | See below |
| Hand Grenade Court MRS02 | MEC / MC | Undeveloped land / cattle pasture land | See below |
| | | | |
| | | | |
| Site Closeout Statement | | | |
| To manage the munitions and explosives of concern (MEC) and munitions constituents (MC) risk through a combination of removal action, administrative controls, and public education; thereby rendering the site as safe as reasonably possible to humans and the environment and conducive to the anticipated future land use. | | | |
| **Customer's Schedule Requirements** | | | |
| Site Inspection and Reporting Complete by July 2012 | | | |
| **Customer's Site Budget** | | | |
| Site Inspection and Reporting: Fully Funded through SI Phase | | | |

| IDENTIFY SITE APPROACH | | |
|---|---|---|
| **EXISTING SITE INFORMATION & DATA EM 200-1-2, Paragraph 1.1.3 and 1.2.1** | | |
| **Attachment(s) to Phase I TPP Memorandum** | **Located at Repository** | **Preliminary Conceptual Site Model** |
| Historical Records Review (USACE, 2010) | N/A for SI Phase; Implemented in post-SI Phase as warranted | No |
| Site-Specific SI Work Plan Addendum | N/A for SI Phase; Implemented in post-SI Phase as warranted | Yes |
| **POTENTIAL POINTS OF COMPLIANCE EM 200-1-2, Paragraph 1.2.1.3** | | |
| Determination of absence or presence of MEC/MC. | | |
| If MC is detected, comparison against risk screening criteria as identified in "Site Constraints and Dependencies" below to determine if further MC evaluation during RI/FS is warranted, if necessary. | | |
| Avoidance of sensitive conditions: wetlands, endangered species, archaeological sites | | |
| | | |
| **MEDIA OF POTENTIAL CONCERN EM 200-1-2, Paragraph 1.2.1.4** | | |
| Qualitative review of MEC presence. | | |
| Quantitative screening of MCs in soil, sediment, and surface water. | | |
| | | |
| | | |
| **SITE OBJECTIVES EM 200-1-2, Paragraph 1.2.2** | | |
| Collection of sufficient MEC and MC data to determine if concentrations are high enough to warrant further study or action. | | |
| Eliminate from further consideration those releases that pose no significant threat to public health or the environment. | | |
| Collection of sufficient data to perform MRSPP scoring and USEPA to conduct MC-related HRS | | |
| *See Programmatic and Site-Specific Work Plan Addendum* | | |
| *See Attached Worksheets Developed by the Project Team* | | |
| **REGULATOR AND STAKEHOLDER PERSPECTIVES EM 200-1-2, Paragraph 1.2.3** | | |
| **Regulators** | **Community Interests** | **Others** |
| FDEP | TBD | TBD |
| | | |
| | | |
| **PROBABLE REMEDIES EM 200-1-2, Paragraph 1.2.4** | | |
| Remedial Action, following RI/FS characterization | | |
| NDAI with institutional controls (signage and education) | | |
| Institutional Controls / Public Education | | |
| **EXECUTABLE STAGES TO SITE CLOSEOUT EM 200-1-2, Paragraph 1.2.5** | | |
| Site Inspection (SI) | | |
| No Department of Defense Action Indicated (NDAI) or RI/FS | | |
| Proposed Plan | | |
| Decision Document | | |
| Remedial Design (RD) | | |
| Remedial Action (as necessary) | | |
| Recurring Review | | |
| Time Critical Removal Action (as required) | | |
| | | |

| IDENTIFY CURRENT PROJECT | |
|---|---|
| **SITE CONSTRAINTS AND DEPENDENCIES** | **EM 200-1-2, Paragraph 1.3.1** |
| Administrative Constraints and Dependencies | |
| Rights of Entry (ROE) | |
| Cultural Resources | |
| Funding beyond the SI | |
| Schedule | |
| Concurrent Planning Programs | |
| Technical Constraints and Dependencies | |
| Property owner/leaseholder site activities (Site access) | |
| Cultural Resources | |
| Topography/vegetation | |
| MEC avoidance screening of MC sample locations for safety | |
| Environmentally sensitive areas | |
| Legal and Regulatory Milestones and Requirements | |
| Consistent with CERCLA and NCP, and in compliance with all legally applicable Federal/State requirements. | |
| Public, stakeholder and regulatory involvement and review of key documents | |
| Funding beyond the SI | |
| **Soil/Sediment:** The human health selected values are the more stringent between USEPA RSLs for Chemical Contaminants at Superfund Sites for Residential Soil, November, 2010 and FDEP FAC 62-777 Soil Cleanup Target Levels (more stringent of the Direct Exposure Residential and leachability Based on Freshwater Surface Water Criteria and leachability based on Groundwater Criteria), February 2005. The ecological selected values for soil are USEPA Region 4 Ecological Screening Values, updated November 30, 2001. When Region 4 ESVs are not available, ESVs were obtained from the most recent version of the sources referenced in the PSAP Addendum (USACE, 2006). **Sediment**: The selected ecological values were the more stringent of FDEP Sediment Quality Assessment Guidelines (SQAG), January 2003 and USEPA Region 4 Ecological Screening Values for Sediment supplemented with ESVs obtained from sources identified in the 2006 Programmatic Sampling and Analysis Plan (PSAP) Addendum, updated with most current values, in absence of available ESV from FDEP SQAG and Region 4 ESVs. | |
| **Surface Water:** More stringent of USEPA RSLs for Chemical Contaminants at Superfund Sites for Tapwater, November, 2010 and FDEP FAC 62-777 Groundwater and Surface Water Cleanup Target Levels, Freshwater Surface Water Criteria and FAC 62-302 Surface Water Quality Standards (for Class III waters). The ecological selected values are more stringent of FAC 62-302 Surface Water Quality Standards (SWQS; for Class III waters) and USEPA Region 4 Ecological Screening Values for Freshwater Surface Water supplemented with ecological screening value sources from 2006 Programmatic Sampling and Analysis Plan (PSAP) Addendum, updated with most current values, in absence of available value from FAC 62-302 SWQS and Region 4 values. | |
| **CURRENT EXECUTABLE STAGE** | **EM 200-1-2, Paragraph 1.3.3** |
| TPP Technical Memorandum | |
| Site-specific Work Plan Addendum | |
| Site Inspection | |
| TPP Meeting #2 | |
| SI Report | |
| | |
| | |

| **Basic** (For Current Projects) | **Optimum** (For Future Projects) | **Excessive** (Objectives that do not lead to site closeout) |
|---|---|---|
| Site Reconnaissance | NDAI or RI/FS | |
| | | |
| | | |
| | | |
| | | |

**Acronyms**

AOC - Area of Concern
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CESAJ - U.S. Army Corps of Engineers, Jacksonville District
FUDS - Formerly Used Defense Sites
HRS - Hazard Ranking System
MC - munitions constituents
MEC - munitions and explosives of concern
MRSPP - Munitions Response Site Prioritization Protocol
NCP - National Contingency Plan
NDAI - No Department of Defense Action Indicated
NPS - National Park Service
RI/FS - Remedial Investigation / Feasibility Study
SI - Site Inspection
TBD - To be determined
TPP - Technical Project Planning
USEPA -U.S. Environmental Protection Agency
USFWS - U.S. Fish & Wildlife Service

**PROJECT OBJECTIVES WORKSHEET**

SITE: **300 Yard Known Distance Rifle Range MRS01**

PROJECT: **Leesburg Air Service Center**



| Site Objective [a] | | | | | Data Needs | Data Collection Methods | Data Users | Project Objective Classification [d] |
|---|---|---|---|---|---|---|---|---|
| Number | Executable Stage [b] | | Description | Source [c] | | | | |
| | Current | Future | | | | | | |
| 1 | Yes | | Determine presence/lack thereof of MEC. | ASR, Recon | Are there any MEC? If so what type, where and hazard posed. Future LU. | Qualitative Reconnaissance | Risk and Remedy Perspectives | Basic |
| 2 | Yes | | Determine if the concentration of MC is high enough to pose a risk to human health or the environment. | Surface Soil, Surface Water, and Sediment Sampling | Is there any MC present in surface soil samples collected from this MRS? Is there any MC present in surface water or sediment samples collected from this MRS? If present, what is it? To what degree is it present? Is it above the designated comparison criteria? And if so, is action required? Future LU. | Sample collection IAW SAP | Risk and Remedy Perspectives | Basic |
| | | | | | | | | |
| | | | | | | | | |

(a) Refer to EM 200-1-2, Paragraph 1.2.2

(b) Refer to EM 200-1-2, Paragraph 1.2.5

(c) For example, Meeting with Customer/stakeholder/Regulator, State Regulation

(d) Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3.

IAW - In accordance with
MEC - Munitions and Explosives of Concern
LU - Land Use
MC - Munitions Constituents
SAP - Sampling and Analysis Plan

**PROJECT OBJECTIVES WORKSHEET**

SITE: **Hand Grenade Court MRS02**

PROJECT: **Leesburg Air Service Center**



| Site Objective [a] | | | | | Data Needs | Data Collection Methods | Data Users | Project Objective Classification [d] |
|---|---|---|---|---|---|---|---|---|
| Number | Executable Stage [b] | | Description | Source [c] | | | | |
| | Current | Future | | | | | | |
| 1 | Yes | | Determine presence/lack thereof of MEC. | ASR, Recon | Are there any MEC? If so what type, where and hazard posed. Future LU. | Qualitative Reconnaissance | Risk and Remedy Perspectives | Basic |
| 2 | Yes | | Determine if the concentration of MC is high enough to pose a risk to human health or the environment. | Surface Soil, Surface Water, and Sediment Sampling | Is there any MC present in surface soil samples collected from this MRS? Is there any MC present in surface water or sediment samples collected from this MRS? If present, what is it? To what degree is it present? Is it above the designated comparison criteria? And if so, is action required? Future LU. | Sample collection IAW SAP | Risk and Remedy Perspectives | Basic |
| | | | | | | | | |
| | | | | | | | | |

(a) Refer to EM 200-1-2, Paragraph 1.2.2

(b) Refer to EM 200-1-2, Paragraph 1.2.5

(c) For example, Meeting with Customer/stakeholder/Regulator, State Regulation.

(d) Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3.

IAW - In accordance with

MEC - Munitions and Explosives of Concern

LU - Land Use

MC - Munitions Constituents

SAP - Sampling and Analysis Plan

# MEC DATA QUALITY OBJECTIVE WORKSHEET

SITE: **Leesburg Air Service Center, Wildwood, Florida**
PROJECT: **MMRP Site Inspection / FUDS Project No. I04FL014301**
DQO STATEMENT NUMBER: **1 of 4**

| DQO Element Number* | DQO Element Description* | Site-Specific DQO Statement |
|---|---|---|
| **Intended Data Use(s):** | | |
| 1 | Project Objective(s) Satisfied | Evaluate presence/lack thereof of MEC |
| **Intended Need Requirements:** | | |
| 2 | Data User Perspective(s) | Risk, Remedy |
| 3 | Contaminant or Characteristic of Interest | MEC, MD |
| 4 | Media of Interest | N/A |
| 5 | Required Locations or Areas | 300 Yard KD Rifle Range MRS and Grenade Court MRS |
| 6 | Number of Samples Required | QR path (total length) to be determined |
| 7 | Reference Concentration of Interest or Other Performance Criteria | Any indication of residual MEC/MD will be evaluated. Based on the indications of type, degree and quantity of MEC/MD a recommendation will be made regarding subsequent actions at the site. If the presence of MEC is confirmed or physical evidence of a potential explosive hazard is identified, a RI/FS may be recommended. If there are no anomalies detected and a potential explosive hazard is not identified, an NDAI recommendation may be warranted. |
| **Appropriate Sampling and Analysis Methods:** | | |
| 8 | Sampling Method | Qualitative Reconnaissance with magnetometer (Schonstedt GA 92 XTi) |
| 9 | Analytical Method | N/A |

* Refer to EM 200-1-2, Paragraph 4.2.1

## MC DATA QUALITY OBJECTIVE WORKSHEET

SITE: **Leesburg Air Service Center, Wildwood, Florida**
PROJECT: **MMRP Site Inspection / FUDS Project No. I04FL014301**
DQO STATEMENT NUMBER: **2 of 4**

| DQO Element Number* | DQO Element Description* | Site-Specific DQO Statement |
|---|---|---|
| **Intended Data Use(s):** | | |
| 1 | Project Objective(s) Satisfied | Evaluate presence/lack thereof of MC |
| **Intended Need Requirements:** | | |
| 2 | Data User Perspective(s) | Risk, Remedy |
| 3 | Contaminant or Characteristic of Interest | See Tables 4.4a and 4.4b |
| 4 | Media of Interest | Surface Soil, potentially Surface Water & Sediment |
| 5 | Required Sampling Locations or Areas and Depths | As determined by the Project Team, see Figure 3. Biased locations based on locations of the various areas of concern. Depth is 0 to 2 inches for surface soil. |
| 6 | Number of Samples Required<br>• Discretionary surface water/sediment | 16 biased surface soil samples and 3 ambient surface soil samples. Two biased surface water/ sediment sample couples and two ambient surface water /sediment sample couples. Plus associated QA/QC samples. |
| 7 | Reference Concentration of Interest or Other Performance Criteria | **Soil:** The human health selected values are the more stringent between USEPA RSLs for Chemical Contaminants at Superfund Sites for Residential Soil, November, 2010, and FDEP FAC 62-777 Soil Cleanup Target Levels (more stringent of the Direct Exposure Residential and leachability based on Freshwater Surface Water Criteria and leachability based on Groundwater Criteria), February 2005. The ecological selected values are USEPA Region 4 Ecological Screening Values, updated November 30, 2001. When Region 4 ESVs are not available, ESVs were obtained from the most recent version of the sources referenced in the PSAP Addendum (USACE, 2006). Screening Values as listed in Tables 4.5a – 4.5c. |

## MC DATA QUALITY OBJECTIVE WORKSHEET (CONTINUED)

SITE: **Leesburg Air Service Center, Wildwood, Florida**
PROJECT: **MMRP Site Inspection / RUDS Project No. I04FL014301**
DQO STATEMENT NUMBER: **2 of 4**

| **Appropriate Sampling and Analysis Methods:** | | |
|---|---|---|
| 7 | Reference Concentration of Interest or Other Performance Criteria | **Sediment:** The selected values for ecological were the more stringent of FDEP Sediment Quality Assessment Guidelines (SQAG), January 2003 and USEPA Region 4 Ecological Screening Values for Sediment supplemented with ESVs obtained from sources identified in the 2006 Programmatic Sampling and Analysis Plan (PSAP) Addendum, updated with most current values, in absence of available ESV from FDEP SQAG and Region 4 ESVs. **Surface Water-human health**: More stringent of USEPA RSLs for Chemical Contaminants at Superfund Sites for Tapwater, November, 2010 and FDEP FAC 62-777 Groundwater and Surface Water Cleanup Target Levels, Freshwater Surface Water Criteria and FAC 62-302 Surface Water Quality Standards (for Class III waters). **Surface Water-ecological**: More stringent of FAC 62-302 Surface Water Quality Standards (SWQS; for Class III waters) and USEPA Region 4 Ecological Screening Values for Freshwater Surface Water supplemented with ecological screening value sources from 2006 Programmatic Sampling and Analysis Plan (PSAP) Addendum, updated with most current values, in absence of available value from FAC 62-302 SWQS and Region 4 values. Screening Values as listed in Tables 4.5a – 4.5c. |
| 8 | Sampling Method | Discrete samples in accordance with the FDEP and TPP Team concurrence |
| 9 | Analytical Method | SW6020/SW6010B-Metals<br>SW8321A-Explosives |

* Refer to EM 200-1-2, Paragraph 4.2.1

**MRSPP Data Quality Objective Worksheet**

**Site:** Leesburg Air Service Center, Leesburg, Florida
**Project:** MMRP Site Inspection / FUDS No. I04FL014301
**DQO Statement Number:** 3 of 4

| Module | Table # | Table Description | Known Data | Current Data Gap | Data Source |
|---|---|---|---|---|---|
| Explosive Hazard Evaluation (EHE) | 1 | Munitions Type | X | | Historical Records/Findings |
| | 2 | Source of Hazard | X | | Historical Maps |
| | 3 | Location of Munitions | | X | Historical or Field Findings |
| | 4 | Ease of Access | | X | Field Findings |
| | 5 | Status of Property | X | | Historical Records |
| | 6 | Population Density | | X | U.S. Census Bureau |
| | 7 | Population Near Hazard | | X | Field Findings |
| | 8 | Types of Activities/Structures | | X | Regional Zoning |
| | 9 | Ecological and/or Cultural Resources | | X | State Historic Preservation Office |
| | 10 | Determining the EHE | | X | Scores from Tables 1 through 9 |
| Chemical Warfare Materiel (CWM) Hazard Evaluation (CHE) | 11 | CWM Configuration | X | | Historical Records/Findings |
| | 12 | Sources of CWM | X | | Historical Records/Findings |
| | 13 | Location of CWM | | X | Historical or Field Findings |
| | 14 | Ease of Access | | X | Field Findings |
| | 15 | Status of Property | X | | Historical Records |
| | 16 | Population Density | | X | U.S. Census Bureau |
| | 17 | Population Near Hazard | | X | Field Findings |
| | 18 | Types of Activities/Structures | | X | Regional Zoning |
| | 19 | Ecological and/or Cultural Resources | | X | State Historic Preservation Office |
| | 20 | Determining the CHE | | X | Scores from Tables 11 through 19 |
| Health Hazard Evaluation (HHE) | 21 | Groundwater Data | X | | N/A |
| | 22 | Surface Water - Human Endpoint | | X | Surface Water Sampling Results (if collected) |
| | 23 | Sediment - Human Endpoint | | X | Sediment Sampling Results (if collected) |
| | 24 | Surface Water - Ecological Endpoint | | X | Surface Water Sampling Results (if collected) |
| | 25 | Sediment - Ecological Endpoint | | X | Sediment Sampling Results (if collected) |
| | 26 | Surface Soil | | X | Surface Soil Sampling Results |
| | 27 | Supplemental Contaminant Hazard Factor | | X | All MC Sampling Results |
| | 28 | Determining the HHE | | X | Scores from Tables 21 through 27 |
| | 29 | MRS Priority | | X | Scores from Tables 10, 20, and 28 |
| | A | MRS Background Information | X | | DoD Databases |

**HRS Data Quality Objective Worksheet**

**Site:** Leesburg Air Service Center, Leesburg, Florida
**Project:** MMRP Site Inspection / FUDS No. I04FL014301
**DQO Statement Number:** 4 of 4

| Data Description | Known Data | Current Data Gap | Data Source |
|---|---|---|---|
| Source Type | X | | Historical Records/Findings |
| Estimated Volume or Area | | X | Field Findings |
| Hazardous Substance | X | | Constituents of Suspected Munitions |
| Groundwater Sample Concentration | X | | N/A |
| Groundwater Use | | X | Well Records/Municipal Data |
| Surface Water Sample Concentration | | X | Sample results (if collected) |
| Surface Water Pathways | | X | Municipal data |
| Soil Sample Concentration | | X | Sample Results |
| Soil Pathways | | X | Municipal Data |
| Sensitive Environments | | X | State Historic Preservation Office, US Fish and Wildlife Service, various government agencies |
| Attractiveness/Accessibility | | X | Field Findings/Land Use Records |

# APPENDIX C

## Interview Documentation
## Not Applicable

# APPENDIX D

# Field Notes and Field Forms

# DAILY FIELD REPORT
# MMRP SITE INSPECTION

| | | | |
|---|---|---|---|
| **CONTRACT NO.** | **W912DY-04-D-0005** | **DELIVERY ORDER NO.** | **0009** |
| **JOB NO:** | **748037-10014** | **DATE/DAY:** | 23-Aug-11 |
| **SITE NAME:** | Leesburg ASC | **REPORT NO:** | 1 |
| **USACE DISTRICT:** | **CESAJ** | **SHEET:** | 1 |
| **WEATHER:** | Partly sunny, scattered showers, low of 75, high of 96 | | |

**WORK IN PROGRESS OR COMPLETED:**

## 1. Mobilization/Demobilization

| | | CUMULATIVE |
|---|---|---|
| **885** | ***Miles Driven*** | **885** |
| **1/500** | ***Number of Flights/Miles Flown*** | **1/500** |
| **3** | ***Number of Personnel*** | **3** |

## 2. Reconnaissance Details

| | | |
|---|---|---|
| **0** | ***Linear Feet:*** | **0** |

## 3. MC Sampling Details

| | | |
|---|---|---|
| **0** | ***Soil Samples*** | **0** |
| **0** | ***Sediment Samples*** | **0** |
| **0** | ***Water Samples*** | **0** |

## 4. QC Activities

| | | |
|---|---|---|
| **0** | ***Soil Samples*** | **0** |
| **0** | ***Sediment Samples*** | **0** |
| **0** | ***Water Samples*** | **0** |

## 5. QA Activities

| | | |
|---|---|---|
| **0** | ***Soil Samples*** | **0** |
| **0** | ***Sediment Samples*** | **0** |
| **0** | ***Water Samples*** | **0** |

**Sampling Notes: No QA samples for this site.**

## 6. Safety Activities

No safety brief was performed on this mobilization day.

| **PARSONS SITE VISIT TEAM (SVT)** | | | On-site Yes/No | Tailgate Brief Yes/No |
|---|---|---|---|---|
| Parsons Field Team Leader - | Erich Stedman | Cell Phone: 678-595-8650 | No | No |
| Parsons UXO Technician/SSHO - | Jon Bell | Cell Phone: 850-685-5145 | No | No |
| Parsons Sampling Technician - | Steve Czekalski | Cell Phone: 919-606-0381 | No | No |
| **VISITORS** | | | | |
| None | | | | |

**EQUIPMENT LIST:**

| | | | | | |
|---|---|---|---|---|---|
| **Standard Field Kit Items:** | Schonstedt GA-92XTd, 3 Garmin 520/530 Rino handheld GPS/radio, Trimble GeoXT, Digital Camera and First Aid Kit. | | | | |
| **Water Sampling Equipment:** | U-53 | | | | |
| **QUALITY CONTROL CHECKS** | **Analog Instrument** | **YES** | | **NO** | X |
| | **Handheld GPS** | **YES** | | **NO** | X |
| | **GIS Data Logger** | **YES** | | **NO** | X |

## DAILY FIELD SI ACTIVITIES CONDUCTED

The SVT mobilized to the site today. Two team members drove and one flew. Supplies were bought and equipment prepped.

## ACTIVITIES SCHEDULED FOR NEXT WORK DAY:

The SVT will start QR and sampling in the MRS.

## REQUEST FOR PROJECT ACTION:

None

| | | | |
|---|---|---|---|
| **ACCIDENTS REPORTED TODAY:** | 0 | | |
| **ACCIDENTS TO DATE:** | 0 | **PREPARED BY FTL:** | Erich Stedman |

## Check all attachments:

_____ Field sampling forms (in separate submittal)
_____ Field-generated analytical results
_____ Chain-of-custody forms (in separate submittal)

| | | |
|---|---|---|
| **Signed by:** |  | |
| **Name** | Erich Stedman, FTL | |
| **Date:** | 23-Aug-11 | |
| **Phone** | Mobile: 678-595-8650 | Office#: 678-969-2428 |
| **Copies sent to:** | | |
| | Deborah Walker (CEHNC-EMM) | William A. Spence (CESAJ) |
| | Paula K. Henderson (MM DC) | Rebecca Terry (MM DC) |
| | Kelley Longberg (MM DC) | Michael D'Auben (MM DC) |
| | Don Silkebakken (Parsons PM) | Tim Davis (Parsons) |
| | Laura Kelley (Parsons PM) | Kathy Rowland (Parsons) |
| | Tammy Chang (Parsons) | Mohammad Estiri (Eco Solutions) |
| | Carlos Hernandez (Eco Solutions) | Opjit Ghuman (Eco Solutions) |

## DAILY FIELD REPORT
## MMRP SITE INSPECTION

| | | | |
|---|---|---|---|
| **CONTRACT NO.** | **W912DY-04-D-0005** | **DELIVERY ORDER NO.** | **0009** |
| **JOB NO:** | **748037-10014** | **DATE/DAY:** | 24-Aug-11 |
| **SITE NAME:** | Leesburg ASC | **REPORT NO:** | 2 |
| **USACE DISTRICT:** | **CESAJ** | **SHEET:** | 1 |
| **WEATHER:** | Partly sunny with a low of 76 and a high of 93 | | |

**WORK IN PROGRESS OR COMPLETED:**

### 1. Mobilization/Demobilization

| | | CUMULATIVE |
|---|---|---|
| 40 | ***Miles Driven*** | **925** |
| 0/0 | ***Number of Flights/Miles Flown*** | **1/500** |
| 3 | ***Number of Personnel*** | **3** |

### 2. Reconnaissance Details

| | | |
|---|---|---|
| 9,200 | ***Linear Feet:*** | **9,200** |

### 3. MC Sampling Details

| | | |
|---|---|---|
| 19 | ***Soil Samples*** | **19** |

**Sampling Notes: See Attached DQCR**

### 4. QC Activities

| | | |
|---|---|---|
| 6 | ***Soil Samples*** | **6** |

**Sampling Notes: See Attached DQCR**

### 5. QA Activities

| | | |
|---|---|---|
| 0 | ***Soil Samples*** | **0** |

**Sampling Notes: No QA samples for this site.**

### 6. Safety Activities

A safety briefing was performed. Topics covered were MEC/MD, route to the hospital, poisonous plants/animals, slips trips falls and PPE.

| PARSONS SITE VISIT TEAM (SVT) | | | | On-site Yes/No | Tailgate Brief Yes/No |
|---|---|---|---|---|---|
| Parsons Field Team Leader - | Erich Stedman | Cell Phone: | 678-595-8650 | Yes | Yes |
| Parsons UXO Technician/SSHO - | Jon Bell | Cell Phone: | 850-685-5145 | Yes | Yes |
| Parsons Sampling Technician - | Steve Czekalski | Cell Phone: | 919-606-0381 | Yes | Yes |
| **VISITORS** | | | | | |
| None | | | | | |

**EQUIPMENT LIST:**

| | | | | | |
|---|---|---|---|---|---|
| **Standard Field Kit Items:** | Schonstedt GA-92XTd, 3 Garmin 520/530 Rino handheld GPS/radio, Trimble GeoXT, Digital Camera and First Aid Kit. | | | | |
| **QUALITY CONTROL CHECKS** | **Analog Instrument** | **YES** | | **NO** | X |
| | **Handheld GPS** | **YES** | | **NO** | X |
| | **GIS Data Logger** | **YES** | | **NO** | X |

**ACTIVITIES SCHEDULED FOR NEXT WORK DAY:**

The SVT will mobilize back to their homes.

**REQUEST FOR PROJECT ACTION:**

None

**ACCIDENTS REPORTED TODAY:** 0
**ACCIDENTS TO DATE:** 0
**PREPARED BY FTL:** Erich Stedman

# DAILY CONTRACTOR QUALITY CONTROL REPORT

**Contract Number:** W912DY-04-D-0005
**Delivery Order Number:** 0009
**Project Name:** MMRP FUDS SI
**Project Number:** 748037-10014
**Site Location:** Leesburg ASC
**Date:** 24-Aug-11

## DAILY FIELD SI ACTIVITIES CONDUCTED

The SVT collected 9,200 Ft of walked QR from the MRSs. The SVT started in the area around the potential firing lines for the 300 Yard Rifle Range. No sign of the firing line was observed. The 4 soil samples in this area were collected from their proposed location. The next area observed was MRS02, Hand Grenade Court. No sign of the court or any MD was observed and the 4 samples were also collected in their proposed locations. The final area visited was the Berm area of the 300 Yard Rifle Range. The berm was observed in the trees near its approximated location. It is about 10 Ft tall and about 400 Ft long. There were no bullets observed and no subsurface anomalies were heard using the Schoenstedt.

The 8 samples proposed for this area were moved to the berm to better represent the most likely biased soils. The QR was slightly adjusted due to heavy vegetation and the berm location. The fence for the run-off basin also went through the QR so a little bit was cut off. The only area where the SVT saw a potential for surface water was the run-off basin previously mentioned (it was dry). The basin was built when the highway was expanded and is meant to help drain the highway. No other evidence of munitions use was observed during this site visit. The samples were packed and shipped via FedEx overnight to the lab.

## TOMORROW'S OPERATIONS PLAN

The SVT will mobilize back to their homes.

**List all field and quality control samples collected (list or provide attachment):**

| Sample ID | Media | Time | Analysis | Shipment Date | Lab | Comments |
|---|---|---|---|---|---|---|
| LASC-MRS01-SS-02-01 | Soil | 848 | Explosives | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-02 | Soil | 857 | Explosives | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-04 | Soil | 907 | Explosives | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-03 | Soil | 916 | Explosives | 8/24/2011 | APPL | |
| LASC-MRS02-SS-02-16 | Soil | 930 | Metals (Fe,Zn), Explosives | 8/24/2011 | APPL | |
| LASC-MRS02-SS-02-15 | Soil | 937 | Metals (Fe,Zn), Explosives | 8/24/2011 | APPL | |
| LASC-MRS02-SS-02-13 | Soil | 943 | Metals (Fe,Zn), Explosives | 8/24/2011 | APPL | MS/MSD |
| LASC-MRS02-SS-02-14 | Soil | 951 | Metals (Fe,Zn), Explosives | 8/24/2011 | APPL | |
| LASC-MRS02-SS-02-21 | Soil | 1015 | Metals (Fe,Zn), Explosives | 8/24/2011 | APPL | FD of LASC-MRS02-SS-02-14 |
| LASC-MRS01-SS-02-05 | Soil | 1029 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-20 | Soil | 1129 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | FD of LASC-MRS01-SS-02-05 |
| LASC-MRS01-SS-02-06 | Soil | 1032 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | MS/MSD |
| LASC-MRS01-SS-02-07 | Soil | 1036 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-08 | Soil | 1040 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-09 | Soil | 1041 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-10 | Soil | 1043 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-11 | Soil | 1045 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-MRS01-SS-02-12 | Soil | 1049 | Metals (Sb, Cu, Pb) | 8/24/2011 | APPL | |
| LASC-AMB-SS-02-19 | Soil | 1127 | Metals (Sb, Cu, Fe, Pb, Zn) | 8/24/2011 | APPL | Ambient Sample |
| LASC-AMB-SS-02-17 | Soil | 1131 | Metals (Sb, Cu, Fe, Pb, Zn) | 8/24/2011 | APPL | Ambient Sample |
| LASC-AMB-SS-02-18 | Soil | 1135 | Metals (Sb, Cu, Fe, Pb, Zn) | 8/24/2011 | APPL | Ambient Sample |

**Departures from approved SAP:**

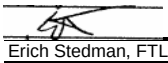
Samples SS-02-05 through SS-02-12 were moved to the berm. QR was slightly adjusted due to vegetation and to cover the berm. APPL lab is being used instead of Test America.

**Instructions given by government personnel:**

None

**Check all attachments:**

| | |
|---|---|
| | Field sampling forms (in separate submittal) |
| | Field-generated analytical results |
| X | Chain-of-custody forms (in separate submittal) |

| | | |
|---|---|---|
| **Signed by:** |  | |
| **Name** | Erich Stedman, FTL | |
| **Date:** | 24-Aug-11 | |
| **Phone** | Mobile: 678-595-8650 | Office#: 678-969-2428 |
| **Copies sent to:** | | |
| | Deborah Walker (CEHNC-EMM) | William A. Spence (CESAJ) |
| | Paula K. Henderson (MM DC) | Rebecca Terry (MM DC) |
| | Kelley Longberg (MM DC) | Michael D'Auben (MM DC) |
| | Don Silkebakken (Parsons PM) | Tim Davis (Parsons) |
| | Laura Kelley (Parsons PM) | Kathy Rowland (Parsons) |
| | Tammy Chang (Parsons) | Mohammad Estiri (Eco Solutions) |
| | Carlos Hernandez (Eco Solutions) | Opjit Ghuman (Eco Solutions) |

# DAILY FIELD REPORT
## MMRP SITE INSPECTION

| | | | |
|---|---|---|---|
| **CONTRACT NO.** | **W912DY-04-D-0005** | **DELIVERY ORDER NO.** | **0009** |
| **JOB NO:** | **748037-10014** | **DATE/DAY:** | 25-Aug-11 |
| **SITE NAME:** | Leesburg ASC | **REPORT NO:** | 3 |
| **USACE DISTRICT:** | **CESAJ** | **SHEET:** | 1 |
| **WEATHER:** | Partly sunny with a low of 76 and a high of 93 | | |

**WORK IN PROGRESS OR COMPLETED:**

### 1. Mobilization/Demobilization

| | | CUMULATIVE |
|---|---|---|
| 885 | *Miles Driven* | 1810 |
| 1/500 | *Number of Flights/Miles Flown* | 2/1000 |
| 3 | *Number of Personnel* | 3 |

### 2. Reconnaissance Details

| | | |
|---|---|---|
| 0 | *Linear Feet:* | 9,200 |

### 3. MC Sampling Details

| | | |
|---|---|---|
| 0 | *Soil Samples* | 19 |

### 4. QC Activities

| | | |
|---|---|---|
| 0 | *Soil Samples* | 6 |

### 5. QA Activities

| | | |
|---|---|---|
| 0 | *Soil Samples* | 0 |

**Sampling Notes: No QA samples for this site.**

### 6. Safety Activities

No safety brief was performed on this demobilization day.

| PARSONS SITE VISIT TEAM (SVT) | | | | On-site Yes/No | Tailgate Brief Yes/No |
|---|---|---|---|---|---|
| Parsons Field Team Leader - | Erich Stedman | Cell Phone: | 678-595-8650 | No | No |
| Parsons UXO Technician/SSHO - | Jon Bell | Cell Phone: | 850-685-5145 | No | No |
| Parsons Sampling Technician - | Steve Czekalski | Cell Phone: | 919-606-0381 | No | No |
| **VISITORS** | | | | | |
| None | | | | | |

**EQUIPMENT LIST:**

| | | | | | |
|---|---|---|---|---|---|
| **Standard Field Kit Items:** | Schonstedt GA-92XTd, 3 Garmin 520/530 Rino handheld GPS/radio, Trimble GeoXT, Digital Camera and First Aid Kit. | | | | |
| **QUALITY CONTROL CHECKS** | **Analog Instrument** | **YES** | | **NO** | X |
| | **Handheld GPS** | **YES** | | **NO** | X |
| | **GIS Data Logger** | **YES** | | **NO** | X |

**ADDITIONAL INFORMATION**

The SVT mobilized back to their homes.

**ACTIVITIES SCHEDULED FOR NEXT WORK DAY:**

None

**ACCIDENTS REPORTED TODAY:** 0
**ACCIDENTS TO DATE:** 0
**PREPARED BY FTL:** Erich Stedman

**Check all attachments:**

_____ Field sampling forms (in separate submittal)
_____ Field-generated analytical results
_____ Chain-of-custody forms (in separate submittal)

**Signed by:** 

**Name** Erich Stedman, FTL
**Date:** 25-Aug-11
**Phone** Mobile: 678-595-8650 Office#: 678-969-2428
**Copies sent to:**

| | |
|---|---|
| Deborah Walker (CEHNC-EMM) | William A. Spence (CESAJ) |
| Paula K. Henderson (MM DC) | Rebecca Terry (MM DC) |
| Kelley Longberg (MM DC) | Michael D'Auben (MM DC) |
| Don Silkebakken (Parsons PM) | Tim Davis (Parsons) |
| Laura Kelley (Parsons PM) | Kathy Rowland (Parsons) |
| Tammy Chang (Parsons) | Mohammad Estiri (Eco Solutions) |
| Carlos Hernandez (Eco Solutions) | Opjit Ghuman (Eco Solutions) |

# APPENDIX E

# Photo-Documentation Log

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 8:48:28 AM | ***Point_ID:*** | 1 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.821539 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.97415 |
| ***Sample ID:*** | LASC-MRS01-SS-02-01 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0001.JPG
Sample location

IMG_0002.JPG
View north

IMG_0003.JPG
View east

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 8:57:31 AM | ***Point_ID:*** | 2 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.821683 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.973769 |
| ***Sample ID:*** | LASC-MRS01-SS-02-02 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0004.JPG
Sample location

IMG_0005.JPG
View north

IMG_0006.JPG
View west

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 9:08:07 AM | ***Point_ID:*** | 3 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.820969 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.973308 |
| ***Sample ID:*** | LASC-MRS01-SS-02-04 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0007.JPG
Sample location

IMG_0008.JPG
View east

IMG_0009.JPG
View west

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 9:16:37 AM | ***Point_ID:*** | 4 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.82085 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.973686 |
| ***Sample ID:*** | LASC-MRS01-SS-02-03 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0010.JPG
Sample location

IMG_0011.JPG
View south

IMG_0012.JPG
View north

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS02 | ***Time*** | 9:30:50 AM | ***Point_ID:*** | 5 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.820286 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.974242 |
| ***Sample ID:*** | LASC-MRS02-SS-02-16 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | Low Density |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0013.JPG
Sample location

IMG_0014.JPG
View east

IMG_0015.JPG
View west

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS02 | ***Time*** | 9:37:43 AM | ***Point_ID:*** | 6 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.820226378 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.974546324 |
| ***Sample ID:*** | LASC-MRS02-SS-02-15 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0016.JPG
Sample location

IMG_0017.JPG
View north

IMG_0018.JPG
View south

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS02 | ***Time*** | 9:43:25 AM | ***Point_ID:*** | 7 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.820356038 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.974480108 |
| ***Sample ID:*** | LASC-MRS02-SS-02-13 | | | | MS/MSD |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | Low Density |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0019.JPG
Sample location

IMG_0020.JPG
View west

IMG_0021.JPG
View south

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS02 | ***Time*** | 9:51:24 AM | ***Point_ID:*** | 8 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.820427591 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.974315544 |
| ***Sample ID:*** | LASC-MRS02-SS-02-14 | | | | FD21, time 1015 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect | | |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None | | |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A | | |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None | | |
| | | | | ***MD/MOD:*** | N/A | | |

IMG_0022.JPG
Sample location

IMG_0023.JPG
View east

IMG_0024.JPG
View north

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:29:36 AM | ***Point_ID:*** | 9 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819405707 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.973225819 |
| ***Sample ID:*** | LASC-MRS01-SS-02-05 | | | | Moved sample location to berm |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

FD20 time

IMG_0025.JPG
Sample location

IMG_0026.JPG
View east berm

IMG_0027.JPG
View west berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:32:17 AM | ***Point_ID:*** | 10 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819484147 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.972958088 |
| ***Sample ID:*** | LASC-MRS01-SS-02-06 | | | | MS MSD |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

Moved sample location to berm

IMG_0028.JPG
Sample location

IMG_0029.JPG
View east berm

IMG_0030.JPG
View west berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:36:22 AM | ***Point_ID:*** | 11 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819595592 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.97279221 |
| ***Sample ID:*** | LASC-MRS01-SS-02-07 | | | | Moved sample location to berm |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0031.JPG
Sample location

IMG_0032.JPG
View east berm

IMG_0033.JPG
View north

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:40:12 AM | ***Point_ID:*** | 12 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819657368 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.972511091 |
| ***Sample ID:*** | LASC-MRS01-SS-02-08 | | | | Moved sample location to berm |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0034.JPG
Sample location

IMG_0035.JPG
View east berm

IMG_0036.JPG
View south berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:41:53 AM | ***Point_ID:*** | 13 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819713485 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.972426369 |
| ***Sample ID:*** | LASC-MRS01-SS-02-09 | | | | Moved sample location to berm |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect | | |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None | | |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A | | |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None | | |
| | | | | ***MD/MOD:*** | N/A | | |

IMG_0037.JPG
Sample location

IMG_0038.JPG
View west berm

IMG_0039.JPG
View north berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:43:40 AM | ***Point_ID:*** | 14 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.81970786 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.972332388 |
| ***Sample ID:*** | LASC-MRS01-SS-02-10 | | | | Moved sample location to berm |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0040.JPG
Sample location

IMG_0041.JPG
View south berm

IMG_0042.JPG
View west berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:45:00 AM | ***Point_ID:*** | 15 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819771255 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.972243156 |
| ***Sample ID:*** | LASC-MRS01-SS-02-11 | | | | Moved sample location to berm |
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0043.JPG
Sample location

IMG_0044.JPG
View north berm

IMG_0045.JPG
View east berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | MRS01 | ***Time*** | 10:49:01 AM | ***Point_ID:*** | 16 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.81982374 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.972158156 |
| ***Sample ID:*** | LASC-MRS01-SS-02-12 | | | | Moved sample location to berm |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Vegetation:*** | Light Brush | ***Barrier:*** | | ***Subsurface Met:*** | No Detect | | |
| ***Drainage:*** | None | ***Topography:*** | Gentle Slope | ***MEC:*** | None | | |
| ***SoilType:*** | Sand | ***Surface Feature:*** | Berm | ***MEC/MOD:*** | N/A | | |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None | | |
| | | | | ***MD/MOD:*** | N/A | | |

IMG_0046.JPG
Sample location

IMG_0047.JPG
View east berm

IMG_0048.JPG
View south berm

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | Ambient | ***Time*** | 11:27:11 AM | ***Point_ID:*** | 17 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.821608936 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.976844015 |
| ***Sample ID:*** | LASC- AMB-SS-02-19 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Grasses | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0049.JPG
Sample location

IMG_0050.JPG
View south

IMG_0051.JPG
View west

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | Ambient | ***Time*** | 11:31:27 AM | ***Point_ID:*** | 18 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.820662099 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.977206361 |
| ***Sample ID:*** | LASC- AMB-SS-02-17 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Grasses | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0052.JPG
Sample location

IMG_0053.JPG
View north

IMG_0054.JPG
View east

## *Field Team Leader's Site Observations*
## *Leesburg Air Service Center, Sumter County, Florida*

### *Wednesday, August 24, 2011*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Property:*** | Leesburg FL | ***Area:*** | Ambient | ***Time*** | 11:35:48 AM | ***Point_ID:*** | 19 |

| | | | | | |
|---|---|---|---|---|---|
| ***Team Leader:*** | Erich Stedman | ***MRSPP Menu:*** | None | ***Latitude:*** | 28.819852982 |
| ***Sampler:*** | Steve Czekalski | ***MRSPP Note:*** | | ***Longitude:*** | -81.977584376 |
| ***Sample ID:*** | LASC- AMB-SS-02-18 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ***Vegetation:*** | Grasses | ***Barrier:*** | | ***Subsurface Met:*** | No Detect |
| ***Drainage:*** | None | ***Topography:*** | Flat | ***MEC:*** | None |
| ***SoilType:*** | Sand | ***Surface Feature:*** | | ***MEC/MOD:*** | N/A |
| ***SoilColor:*** | Tan | ***Surface Debris:*** | None | ***MD:*** | None |
| | | | | ***MD/MOD:*** | N/A |

IMG_0055.JPG
Sample location

IMG_0056.JPG
View north

IMG_0057.JPG
View south

# APPENDIX F

## Analytical Data
## Electronic Only

# APPENDIX G

# Analytical Data QA/QC Report

# DATA VALIDATION SUMMARY REPORT

**for soil samples collected from**

**LEESBURG AIR SERVICE CENTER**

**Sumter County, Florida**

Data Validation by: Katherine LaPierre

Parsons – Austin

Date: 11 October 2011

## INTRODUCTION

The following data validation summary report covers soil samples and the associated field quality control (QC) samples collected from the Leesburg Air Service Center (ASC) in Sumter County, Florida on 24 August 2011. Samples were logged in under the following Sample Delivery Group (SDG):

65502

The samples in this SDG were analyzed for explosives and metals. Not all samples were analyzed for all parameters. The following table details the requested parameters for each sample. The field QC samples collected in this SDG included two field duplicate (FD) samples and two matrix spike/matrix spike duplicate (MS/MSD) pair. The field QC samples were analyzed for the same parameters as the associated parent sample.

All samples were collected by Parsons and shipped to Agriculture and Priority Pollutants Laboratories, Inc. (APPL) in one cooler. The cooler was received by the laboratory at a temperature of 2.5°C, which was within the 2-6°C range recommended by the PSAP.

All soil samples were prepared and analyzed following the procedures outlined in the Project Sampling and Analysis Plan and Addendum (PSAP) for the Southeast Region and the site specific Sampling and Analysis Plan.

It should be noted that the original PSAP indicated the laboratory used for this site would be TestAmerica-Denver. However, approval was received from United States Army Corps of Engineers (USACE) chemist Rebecca Terry to use APPL as the laboratory for this site on July 25, 2011. All APPL method detection limits (MDLs) and practical quantitation limits (PQLs) were below the lowest associated action level for all target analytes, except as noted in this report. All method quality objectives (MQOs) were met.

## SAMPLE IDs AND REQUESTED PARAMETERS

| Sample ID | Matrix | Explosives | Metals (Sb, Cu, Pb) | Metals (Fe, Zn) | Comments |
|---|---|---|---|---|---|
| LASC-MRS01-SS-02-01 | S | X | | | |
| LASC-MRS01-SS-02-02 | S | X | | | |
| LASC-MRS01-SS-02-03 | S | X | | | |
| LASC-MRS01-SS-02-04 | S | X | | | |
| LASC-MRS01-SS-02-05 | S | | X | | |
| LASC-MRS01-SS-02-06 | S | | X | | MS/MSD |
| LASC-MRS01-SS-02-07 | S | | X | | |
| LASC-MRS01-SS-02-08 | S | | X | | |
| LASC-MRS01-SS-02-09 | S | | X | | |
| LASC-MRS01-SS-02-10 | S | | X | | |
| LASC-MRS01-SS-02-11 | S | | X | | |
| LASC-MRS01-SS-02-12 | S | | X | | |
| LASC-MRS02-SS-02-13 | S | X | | X | MS/MSD |
| LASC-MRS02-SS-02-14 | S | X | | X | |
| LASC-MRS02-SS-02-15 | S | X | | X | |
| LASC-MRS02-SS-02-16 | S | X | | X | |
| LASC-AMB-SS-02-17 | S | | X | X | Ambient |
| LASC-AMB-SS-02-18 | S | | X | X | Ambient |
| LASC-AMB-SS-02-19 | S | | X | X | Ambient |
| LASC-MRS01-SS-02-20 | S | | X | | FD of LASC-MRS01-SS-02-05 |
| LASC-MRS02-SS-02-21 | S | X | | X | FD of LASC-MRS02-SS-02-14 |

S = Soil

## EXTRACTION AND ANALYTICAL METHODS:

| PARAMETER | MATRIX | EXTRACTION METHOD | ANALYTICAL METHOD | UNITS | DRY WT. VS. WET WT |
|---|---|---|---|---|---|
| Explosives | S | 8330B | 8330B | mg/kg | Dry Wt. |
| Metals | S | 3050B | 6010B | mg/kg | Dry Wt. |

See the end of this report for detailed description of the sample preparation procedures.

## EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the Project Work Plan. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the Work Plan were met.

Due to the flagging requirements of the electronic data deliverable (EDD) software, Automatic Data Review (ADR), the following rules were applied for flagging the data:

If an analyte was detected in the method blank, the associated sample concentrations were examined. If the analyte was detected in a sample at a concentration similar to that found in the blank (five times the blank concentration for most analytes, or ten times the blank concentration for common laboratory contaminants), the PQL for that analyte was raised to the detected level and the result was flagged "U" for that particular sample.

Approval was also received from a USACE chemist for laboratory to use the historically developed control limits to evaluate accuracy for explosives. The approved accuracy and precision criteria for explosives are as follows:

| Analyte | Accuracy Criteria | Maximum RPD (%) |
|---|---|---|
| HMX | 75-125% | 30 |
| RDX | 70-135% | 30 |
| 1,3,5-Trinitrobenzene | 75-125% | 30 |
| 1,3-Dinitrobenzene | 80-125% | 30 |
| Nitrobenzene | 75-125% | 30 |
| Tetryl | 10-150% | 30 |
| Nitroglycerin | 68-131% | 30 |
| 2,4,6-Trinitrotoluene | 55-140% | 30 |
| 4-Amino-2,6-dinitrotoluene | 80-125% | 30 |
| 2-Amino-4,6-dinitrotoluene | 80-125% | 30 |
| 2,4-Dinitrotoluene | 80-125% | 30 |
| 2,6-Dinitrotoluene | 80-120% | 30 |
| 3-Nitrotoluene | 75-120% | 30 |
| PETN | 69-132% | 30 |
| 2-Nitrotoluene | 80-125% | 30 |
| 4-Nitrotoluene | 75-125% | 30 |
| 1,2-Dinitrobenzene (Surrogate) | 70-130% | NA |

For metals, the accuracy criteria for the LCS, MS, and MSD are 80-120% and the precision criteria for the relative percent difference (RPD) of the MS/MSD pair is RPD≤20.

The field duplicate criteria (RPD ≤ 70) were approved by Deborah Walker and Rebecca Terry for the southeast region of the program.

## EXPLOSIVES

### General

The explosives portion of this SDG consisted of nine (9) soil samples. The samples were collected on 24 August 2011 and were analyzed for the full list of explosives as specified in the Work Plan.

The explosives analyses were performed according to the United States Environmental Protection Agency (USEPA) SW846 Method 8330B. All samples in this SDG were analyzed following the procedures outlined in the laboratory Standard Operation Procedure (SOP) which was approved by USACE. All samples were prepared and analyzed within the holding time required by the method.

The explosives samples were extracted in one batch (110902A). The samples were analyzed on two different instruments/columns under two different initial calibrations (ICALs). All analyses were performed undiluted.

### Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS sample, the MS/MSD samples, and the surrogate spikes.

All LCS, MS/MSD, and surrogate spike recoveries were within acceptance criteria.

### Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD concentrations. Precision was further assessed by comparing the field duplicate analyte results.

All MS/MSD RPDs were within acceptance criteria.

All target explosives were non-detect in the parent and field duplicate samples for both field duplicate pair.

### Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the Work Plan;
- Comparing actual analytical procedures to those described in the Work Plan;
- Evaluating holding times; and
- Examining the laboratory blank for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the Work Plan. All samples were prepared and analyzed within the holding time required by the method and the Work Plan.

- All initial calibration criteria were met.
- All secondary source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- The limits of detection (LODs) were verified quarterly according to the DoD Quality System Manual (QSM) version 4.2 requirements.
- All sample-specific MDL and PQL values were below the lowest associated action level as listed in the PSAP for this site with the following exceptions:

| Analyte | APPL PQL (mg/kg) | APPL MDL (mg/kg) | Lowest Action Level (mg/kg) |
|---|---|---|---|
| 1,3-Dinitrobenzene | 0.40 | 0.003 | 0.004 |
| 2,4,6-Trinitrotoluene | 0.30 | 0.010 | 0.006 |
| 2,4-Dinitrotoluene | 0.07 | 0.005 | 0.0004 |
| 2,6-Dinitrotoluene | 0.04 | 0.004 | 0.0004 |
| Nitrobenzene | 0.50 | 0.006 | 0.02 |
| Nitroglycerin | 0.50 | 0.017 | 0.03 |
| RDX | 0.50 | 0.006 | 0.002 |

The MDLs for 1,3-dinitrobenzene, nitrobenzene, and nitroglycerin were below the lowest action level taken from the site-specific work plan, so the method quality objectives (MQOs) were met for these analytes. For all other analytes, the MDL values exceeded the lowest action limit due to sample preparation and analytical limitations. These exceedances were known prior to sampling at this site and were documented during the development of the work plan. These analytes are not expected to drive the recommendation for this site.

There was one method blank associated with the explosives analyses in this SDG. All target explosives were non-detect in the method blank.

**Completeness**

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All explosives results for the samples in this SDG were considered usable. The completeness for the explosives portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

## METALS

### General

The metals portion of this SDG consisted of seventeen (17) soil samples. The samples were collected on 24 August 2011. Samples were analyzed for a reduced list of metals as noted in the table on page 2 of this report.

The metals analyses were performed using USEPA SW846 Method 6010B. The samples were analyzed following the procedures outlined in the Work Plan. All samples were prepared and analyzed within the holding time required by the method and the Work Plan.

The samples for metals analyses were digested in one batch (#110908B). The samples were analyzed in one batch under a single ICAL. Sample LASC-MRS02-SS-02-13 required a 20x dilution for iron due to the high concentration present. All other analyses were performed undiluted.

### Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS sample and the MS/MSD samples.

All LCS recoveries were within acceptance criteria.

The MS/MSD analyzed on sample LASC-MRS01-SS-02-06 met criteria for copper and lead but failed for antimony, as follows:

**LASC-MRS01-SS-02-06**

| Metal | MS %R | MSD %R | Criteria |
|---|---|---|---|
| Antimony | 58 | 58 | 80-120% |

Antimony was flagged "J" as estimated in the parent sample, in accordance with the PSAP.

The MS/MSD analyzed on sample LASC-MRS02-SS-02-13 failed to meet criteria for both iron and zinc, as follows:

**LASC-MRS02-SS-02-13**

| Metal | MS %R | MSD %R | Criteria |
|---|---|---|---|
| Iron | 0 | 218 | 80-120% |
| Zinc | 57 | (93) | |

( ) indicates the recovery met criteria.

It should be noted that the parent sample concentration for iron was significantly greater than (more than 6 times) the amount spiked, resulting in the anomalous recoveries. Both metals were flagged "J" as estimated in the parent sample, in accordance with the PSAP.

**Precision**

Precision was evaluated using the RPD obtained from the MS/MSD concentrations. Precision was further evaluated by comparing the field duplicate analyte results.

All MS/MSD RPDs were within acceptance criteria for the MS/MSD pair analyzed on sample LASC-MRS01-SS-02-06.

Both MS/MSD RPDs failed to meet criteria for the MS/MSD pair analyzed on sample LASC-MRS02-SS-02-13, as follows:

**LASC-MRS02-SS-02-13**

| Metal | RPD | Criteria |
|---|---|---|
| Iron | 29 | RPD ≤ 20 |
| Zinc | 28 | |

The parent sample results for iron and zinc were already flagged "J" as estimated in the parent sample due to the non-compliant MS/MSD recoveries, so no additional corrective action was necessary.

All metals detected above the PQL in both the parent and field duplicate samples met RPD criteria, as follows:

**LASC-MRS01-SS-02-05**

| Metal | Parent (mg/kg) | FD (mg/kg) | RPD | Criteria |
|---|---|---|---|---|
| Antimony | 0.37 | 0.23 | 47 | RPD ≤ 70 |
| Copper | 4.1 | 3.4 | 19 | |
| Lead | 30 | 22 | 31 | |

**LASC-MRS02-SS-02-14**

| Metal | Parent (mg/kg) | FD (mg/kg) | RPD | Criteria |
|---|---|---|---|---|
| Iron | 100 | 85 | 16 | RPD ≤ 70 |
| Zinc | 12 | 9.9 | 19 | |

**Representativeness**

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the Work Plan;
- Comparing actual analytical procedures to those described in the Work Plan;
- Evaluating preservation and holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the Work Plan. The samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.
- All metals met criteria in the low-level check standards.
- All second source criteria were met. The ICV sample was prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- A dilution test (DT) was performed on sample LASC-MRS01-SS-02-06 but was not applicable because no target metals were detected in the parent sample at a concentration of 50 times the MDL or greater.
- A post digestion spike (PDS) was analyzed on sample LASC-MRS01-SS-02-06. The PDS met criteria for all target metals, as follows:

| Metal | %R | Criteria |
|---|---|---|
| Antimony | 97 | |
| Copper | 85 | 75 – 125% |
| Lead | 84 | |

- A DT was also performed on sample LASC-MRS02-SS-02-13. The DT was only applicable for iron since zinc was not detected in the parent sample at a concentration of 50 times the MDL or greater. Iron met criteria in the DT, as follows:

| Metal | %D | Criteria |
|---|---|---|
| Iron | 0.58 | %D ≤ 10 |

- A PDS was analyzed on sample LASC-MRS02-SS-02-13. The PDS was only applicable for zinc since iron met criteria in the DT. Zinc met criteria in the PDS, as follows:

| Metal | %R | Criteria |
|---|---|---|
| Zinc | 83 | 75 – 125% |

- The LODs were verified quarterly according to the DoD QSM version 4.2 requirements.
- All sample-specific MDL and PQL values were below the lowest associated action level as listed in the PSAP. Therefore, all MQOs were met

There was one method blank and several calibration blanks associated with the metals analyses in this SDG. All blanks were compliant.

**Completeness**

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All metal results for the samples in this SDG were considered usable. Therefore, the completeness for the metal portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

**COMPARABILITY**

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

**DATA USABILITY**

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The field and laboratory quality control samples and evaluated criteria included field duplicates, analytical duplicates, method blanks, MS/MSD samples, laboratory control spike samples, and surrogates. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, none of the data were qualified as rejected.

All calculations were spot checked and verified. All data in this SDG are considered usable for the purposes of this project. All sample MDLs and PQLs met the requirements listed in the approved site specific Sampling and Analysis Plan except as previously noted in this report. All Method Quality Objectives have been met.

# APPL Inc Non- Incremental Sampling Procedures for Soil

**Sample Drying to a Constant Weight:**

Place approximately 20-30 grams of the sample into a labeled plastic weigh boat (or tray). Dry the samples at room temperature (or LESS) to a “constant weight” as described below:

Record the date / time and the weight of the tray plus sample in a laboratory log book. Leave the samples overnight to dry on shelves in a dark room.

The following morning weigh the tray containing the sample and record the weight, date and time, and place the trays back in the rack. After one hour record the weight, date and time again.

If the weight is consistent with the previous weighing (within +/- 3%), then this step is complete. If the weight is still not constant, continue drying and subsequent weighing until a constant weight is achieved before proceeding to the next step.

## SAMPLE SIEVING AND GRINDING

Crush the dried soil in the weigh boat using a mortar and pestle. Pass the sample through a #30 mesh screen sieve and into a clean, labeled weigh boat in order to eliminate rocks and sticks. Wash the sieve in between each sample with soap and water and rinse with acetone.

## SAMPLE WEIGHING

Weigh 10 grams of sample from the weigh boat into a labeled and tared 4oz. glass jar. Record the weight to the nearest 0.01 grams on the extraction sheet.

One method blank and one LCS are prepared with every analytical batch of 20 samples, using clean commercial sand. The LCS is spiked after sieving and grinding. The blank and LCS are taken through the exact same procedures as the samples.

Matrix Spike / Matrix Spike Duplicates are included for every analytical batch of 20 samples, based on the client's project requirements.

## SAMPLE EXTRACTION

Add the appropriate amount of the 8330 Soil Surrogate (See SOP HPL002 Standard and Spike Prep) for the Blank, the LCS, MSD/MSD and field samples.

Add the appropriate amount of the 8330 Spike Mix (See SOP HPL002 Standard and Spike Prep) for the LCS and MSD/MSD.

Add 20mL Acetonitrile to each jar containing the spiked /surrogated soil. Place jars on a mechanical shaker for at least 18 hours.

Allow the extracts to settle for 30 minutes and remove approximately 8mL of the extract and place in a labeled 8mL amber screw-cap vial. Centrifuge the vials for approximately 10 minutes. Store the samples in a refrigerator between 2°C and 6°C.

Using a digital auto pipettor, remove 0.4mL of the final extract and combine with 0.4mL of DI water in an injection vial. Store under refrigeration until analysis.

# APPENDIX H

## Geographic Information Systems Data
## Provide in Final SI Report
## Electronic Only

# APPENDIX I

## Geophysical Data
## Not Applicable

# APPENDIX J

# Conceptual Site Model

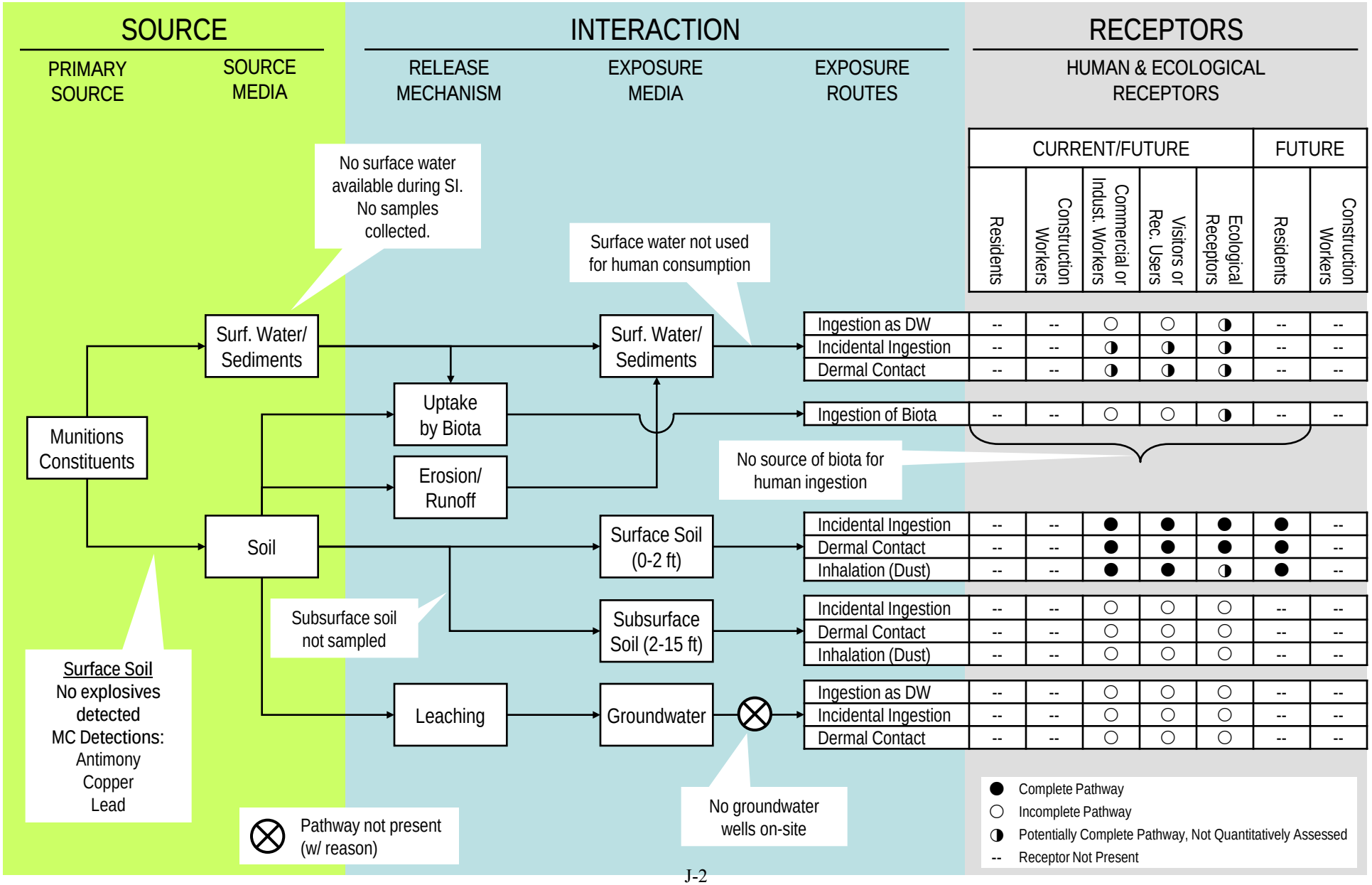
# CONCEPTUAL SITE MODEL
# LEESBURG AIR SERVICE CENTER
# WILDWOOD, FLORIDA

| MRS [2] | Acreage[1, 2] | Suspect Past DoD Activities[1] | Potential MC/MEC Presence[1,3] | MEC/MD Found Since Closure[1,3] | Previous Investigation/ Clearance Actions[1,3,4] | Post-DoD Land Use and Current Land Use[1,3] | Potential Receptors[1] | Potential Source and Receptor Interaction | Field Sampling/ Qualitative Reconnaissance Results |
|---|---|---|---|---|---|---|---|---|---|
| **MRS01- 300 Yard Known Distance Rifle Range** | 910 [1] / 1112 [2] acres | The Leesburg Air Service Center Rifle Range site was established as a remote small arms practice facility for the forces training at the Army Air Forces School of Applied Tactics during World War II. | Small Arms, General | There have been no documented reports of MEC or MD found since site closure. | Inventory Project Report (INPR), dated July 1994<br><br>INPR supplement, dated November 1995<br><br>Historical Records Review (Draft), dated August 2010 | The MRS01- 300 Yard Known Distance Rifle Range is currently timberland and unimproved. County Road 468 traverses part of the former 300-yard firing line. No range-remnants visible in current aerial imagery. | Visitors, recreational users, commercial workers, future residents, and ecological receptors | Potential MEC/MD on surface, and subsurface. Potential MC in surface soil. No access restrictions. | 1.7 Miles of QR was conducted at the Leesburg ASC FUDS. Within the MRS01- 300 Yard Known Distance Rifle Range, a berm approximately 10 feet high and 400 feet in length was observed. No MEC or MD was observed<br>MC metals antimony, copper, and lead were detected in the soil samples collected. The maximum detected concentrations of copper and lead did not exceed their human health or ecological screening values for surface soil at the MRS01- 300 Yard Known Distance Rifle Range. |
| **MRS02- Hand Grenade Court** | 24.92 acres [2] | Potential hand grenade range for training with practice, fragmentation and/or high-explosive hand grenades[1]. | Hand Grenades, Practice , Fragmentation (HE) | There have been no documented reports of MEC or MD found since site closure. | Historical Records Review (Draft), dated August 2010 | The MRS02- Hand Grenade Court is currently timberland and unimproved. No range-remnants visible in current aerial imagery. | Visitors, recreational users, commercial workers and ecological receptors | Potential MEC/MD on surface, and subsurface. Potential MC in surface soil. No access restrictions. | 1.7 Miles of QR was conducted at the Leesburg ASC FUDS. Within the MRS02- Hand Grenade Court, no remnants of the court remain at the site and no MEC or MD was observed.<br>MC metals iron and zinc were detected in the biased surface soil samples analyzed. The maximum detected concentration of zinc was below its human health and ecological screening value for surface soil at the MRS02– Hand Grenade Court. Iron is considered an essential nutrient that is not expected to pose a risk to human receptors. Therefore iron is not generally evaluated as a MC. |
| | | | | | Source<br>(1) = 2010 HRR<br>(2) = 2010 FUDSMIS<br>(3) = 2004 INPR Supplement<br>(4) = 1994 INPR | FUDSMIS= Formerly Used Defense Site Management Information Systems<br>HRR = Historical Records Review<br>INPR = Inventory Project Report<br>MEC = Munitions and Explosives of Concern<br>MC = Munitions Constituents<br>MD = Munitions Debris<br>MRS = Munitions Response Site<br>QR = Qualitative Reconnaissance<br>TBD = To be determined | | | |

# CONCEPTUAL SITE EXPOSURE MODEL

***MRS Name:*** Leesburg Air Service Center – MRS01 300 Yard Known Distance Rifle Range

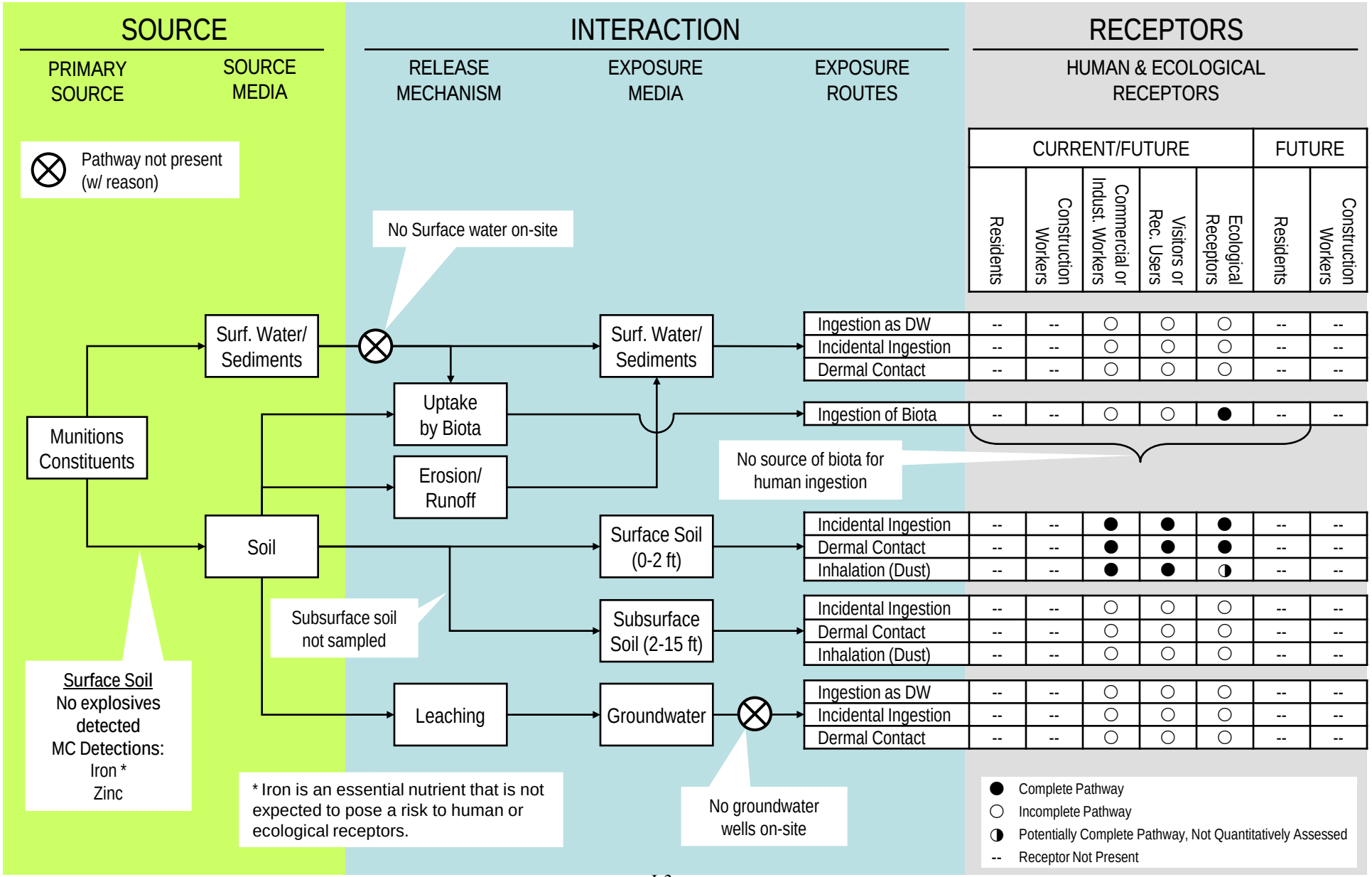
***Completed By:*** Kathy Rowland, PARSONS ***Date Completed:*** October 27, 2011



# CONCEPTUAL SITE EXPOSURE MODEL

***MRS Name:*** Leesburg Air Service Center – MRS02 Hand Grenade Court

***Completed By:*** Kathy Rowland, PARSONS ***Date Completed:*** October 27, 2011



# APPENDIX K

# Munitions Response Site Prioritization Protocol Evaluations (MRSPP)

# Table A

## MRS Background Information

**DIRECTIONS:** Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

**Munitions Response Site Name:** 300 Yard Known Distance Rifle Range

**Component:** US Army

**Installation/Property Name:** Leesburg Air Service Center

**Location (City, County, State):** Sumter County, Florida

**Site Name/Project Name (Project No.):** I04FL014301/I04FL014301M01/FL49799F718400

**Date Information Entered/Updated:** 11/1/2011 11:20:56 AM

**Point of Contact (Name/Phone):** Mr. William Spence / 904-232-3459

**Project Phase (check only one):**

| | | | | |
|---|---|---|---|---|
| ☐ PA | ■ SI | ☐ RI | ☐ FS | ☐ RD |
| ☐ RA-C | ☐ RIP | ☐ RA-O | ☐ RC | ☐ LTM |

**Media Evaluated (check all that apply):**

| | |
|---|---|
| ☐ Groundwater | ☐ Sediment (human receptor) |
| ■ Surface soil | ☐ Surface Water (ecological receptor) |
| ☐ Sediment (ecological receptor) | ☐ Surface Water (human receptor) |

**MRS Summary:**

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

Leesburg Air Service Center (ASC) Formerly Used Defense Sit (FUDS) was used as a satellite training facility of the Army Air Forces School of Applied Tactics based in Orlando, Florida from 1942 to 1945. The 2010 FUDS Management Information System (FUDSMIS) identified two Munitions Response Sites (MRSs) at the FUDS, MRS01 - 300 Yard Known Distance Rifle Range and MRS02- Hand Grenade Court. The 1,112-acre MRS01 - 300 Yard Known Distance Rifle Range was designated a 300-yard Known Distance Rifle Range with firing lines positioned at 100 yards, 200 yards, and 300 yards respectively and was utilized for weapons familiarization and qualifications. Potential munitions used at the MRS01 – Rifle Range consist of .22 Caliber, .38 Caliber, .30 Caliber, and .45 Caliber small arms ammunition. Neither MEC nor MD were observed at the MRS during the SI field activities in August 2011 or during the site visit associated with the 1994 INPR. However, the INPR site survey was not conducted in the area of the MRS. The alternate score of No Known or Suspected MC Hazard has been applied to the HHE module (Table 28) as the MRS recommendation is NDAI and the concentrations of MC or incidental nonmunitions-related contaminants are below levels of concern as determined in the SI Risk Assessment.

The MRSPP score was discussed during the initial Technical Project Planning (TPP) meeting and will be discussed during the TPP closeout meeting. Coordination with key stakeholders is accomplished during the TPP meetings. Documentation of TPP team concurrence and a copy of the public notice will be included in Appendix B of the Final SI Report.

Description of Pathways for Human and Ecological Receptors:

Direct release of MC from munitions activities within the MRS would be primarily to surface soil. Migration of MC from surface soil to surface water and sediment is possible through runoff and erosion. If there were releases of MC to soil as a result of the munitions-related activities, it is possible that the constituents could leach to groundwater at the MRS, however, there are no known wells within the boundaries of the MRS.

Description of Receptors (Human and Ecological):

Based on the current and future land use of the MRS, potential receptors include visitors/recreational users, commercial/industrial workers, future residents and ecological receptors.

# Table 1

## EHE Module: Munitions Type Data Element Table

**DIRECTIONS:** Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

**Note:** The terms practice munitions, small arms ammunition, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Sensitive** | ◆ UXO that are considered likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions).<br>◆ Hand grenades containing energetic filler.<br>◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazardard. | 30 |
| **High explosive (used or damaged)** | ◆ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."<br>◆ DMM containing a high-explosive filler that have:<br>▪ Been damaged by burning or detonation<br>▪ Deteriorated to the point of instability. | 25 |
| **Pyrotechnic (used or damaged)** | ◆ UXO containing a pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).<br>◆ DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have:<br>▪ Been damaged by burning or detonation<br>▪ Deteriorated to the point of instability. | 20 |
| **High explosive (unused)** | ◆ DMM containing a high explosive filler that:<br>▪ Have not been damaged by burning or detonation<br>▪ Are not deteriorated to the point of instability. | 15 |
| **Propellant** | ◆ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).<br>◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are:<br>▪ Damaged by burning or detonation<br>▪ Deteriorated to the point of instability. | 15 |
| **Bulk secondary high explosives, pyrothechnics, or propellant** | ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).<br>◆ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. | 10 |
| **Pyrotechnic (not used or damaged)** | ◆ DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that:<br>▪ Have not been damaged by burning or detonation<br>▪ Are not deteriorated to the point of instability. | 10 |
| **Practice** | ◆ UXO that are practice munitions that are not associated with a sensitive fuze.<br>◆ DMM that are practice munitions that are not associated with a sensitive fuze and that have not:<br>▪ Been damaged by burning or detonation<br>▪ Deteriorated to the point of instability. | 5 |
| **Riot control** | ◆ UXO or DMM containing a riot control agent filler (e.g., tear gas). | 3 |
| **Small arms** | ◆ Used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.]. | *2* |
| **Evidence of no munitions** | ◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. | 0 |
| **MUNITIONS TYPE** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30). | *2* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

Historical documents indicate munitions that may have been used at the MRS consist of .22 Caliber, .30 Caliber, .38 Caliber and .45 Caliber small arms ammunition (2011 SI Report Subchapters 2.3.2, 4.3.1 and Paragraph 6.1.4.2). As small arms are the only munitions known to have been used on the MRS, per USACE guidance (SAIE (ESOH) Memorandum February 2009) there is not an explosive hazard at 300 Yard Known Distance Rifle Range. As a result the EHE module (Table 10) has been rated No Known or Suspected Explosive Hazard. The MRS is sequenced for action based on the HHE rating.

# Table 2

## EHE Module: Source of Hazard Data Element Table

**DIRECTIONS:** Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with **all** the sources of explosive hazards known or suspected to be present at the MRS.

**Note:** The terms former range, practice munitions, small arms range, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Former range** | ◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones. | 10 |
| **Former munitions treatment (i.e., OB/OD) unit** | ◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal. | 8 |
| **Former practice munitions range** | ◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used. | 6 |
| **Former maneuver area** | ◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category. | 5 |
| **Former burial pit or other disposal area** | ◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment. | 5 |
| **Former industrial operating facilities** | ◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility. | 4 |
| **Former firing points** | ◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range. | 4 |
| **Former missile or air defense artillery emplacements** | ◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range. | 2 |
| **Former storage or transfer points** | ◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system). | 2 |
| **Former small arms range** | ◆ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.) | *1* |
| **Evidence of no munitions** | ◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present. | 0 |
| **SOURCE OF HAZARD** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10). | *1* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

The MRS was designated a 300-yard Known Distance Rifle Range with firing lines positioned at 100 yards, 200 yards, and 300 yards respectively and was utilized for weapons familiarization and qualifications. Potential munitions used at the MRS01 – Rifle Range consist of .22 Caliber, .38 Caliber, .30 Caliber, and .45 Caliber small arms ammunition (2011 SI Report, Subchapter 2.3.2 and Paragraph 6.1.4.2).

# Table 3

## EHE Module: Location of Munitions Data Element Table

**DIRECTIONS:** Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

**Note:** The terms confirmed, surface, subsurface, small arms ammunition, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Confirmed surface** | ◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS.<br>◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO | 25 |
| **Confirmed subsurface, active** | ◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS,and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.<br>◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. | 20 |
| **Confirmed subsurface, stable** | ◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.<br>◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. | 15 |
| **Suspected (physical evidence)** | ◆ There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS. | 10 |
| **Suspected (historical evidence)** | ◆ There is historical evidence indicating that UXO or DMM may be present at the MRS. | 5 |
| **Subsurface, physical constraint** | ◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM. | 2 |
| **Small arms (regardless of location)** | ◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.) | *1* |
| **Evidence of no munitions** | ◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. | 0 |
| **LOCATION OF MUNITIONS** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25). | *1* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

Neither MEC nor MD were observed at the MRS during the SI field activities in August 2011 or during the site visit associated with the 1994 INPR, however, the INPR site survey was not conducted in the area of the MRS. The SI SVT observed a target berm approximately 10 feet high and 400 feet in length on the MRS (2011 SI Report, Subchapter 4.3).

# Table 4

## EHE Module: Ease of Access Data Element Table

**DIRECTIONS:** Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

**Note:** The term barrier is defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **No barrier** | ◆ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible). | *10* |
| **Barrier to MRS access is incomplete** | ◆ There is a barrier preventing access to parts of the MRS, but not the entire MRS. | 8 |
| **Barrier to MRS access is complete but not monitored** | ◆ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS. | 5 |
| **Barrier to MRS access is complete and monitored** | ◆ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS. | 0 |
| **EASE OF ACCESS** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10). | *10* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Ease of Access*** classifications in the space provided.

Although a portion of the MRS is fenced, access to the MRS is not restricted (2011 SI Report, Paragraph 6.1.4.3).

# Table 5

## EHE Module: Status of Property Data Element Table

**DIRECTIONS:** Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

| Classification | Description | Score |
|---|---|---|
| **Non-DoD control** | ◆ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. | *5* |
| **Scheduled for transfer from DoD control** | ◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied. | 3 |
| **DoD control** | ◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year. | 0 |
| **STATUS OF PROPERTY** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Status of Property*** classifications in the space provided.

The MRS is owned by Sumter County and various private individuals and corporations (2011 SI Report, Subchapter 2.2.8).

# Table 6

## EHE Module: Population Density Data Element Table

**DIRECTIONS:** Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

**Note:** Note: Use the U.S. Census Bureau tract data available to capture the highest population density within a two-mile radius of the perimeter of the MRS.

| Classification | Description | Score |
|---|---|---|
| **> 500 persons per square mile** | ◆ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located. | 5 |
| **100–500 persons per square mile** | ◆ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located. | *3* |
| **< 100 persons per square mile** | ◆ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located. | 1 |
| **POPULATION DENSITY** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *3* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Population Density*** classifications in the space provided.

The MRS is located in Sumter County, Florida. The 2010 US Census indicates that the population density of Sumter County Florida was 170.8 persons per square mile (2011 SI Report, Paragraph 2.2.7.1).

# Table 7

## EHE Module: Population Near Hazard Data Element Table

**DIRECTIONS:** Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and select the score that corresponds with the number of inhabited structures.

**Note:** The term inhabited structures is defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **26 or more inhabited structures** | ◆ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | *5* |
| **16 to 25 inhabited structures** | ◆ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 4 |
| **11 to 15 inhabited structures** | ◆ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 3 |
| **6 to 10 inhabited structures** | ◆ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 2 |
| **1 to 5 inhabited structures** | ◆ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 1 |
| **0 inhabited structures** | ◆ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 0 |
| **POPULATION NEAR HAZARD** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Population Near Hazard*** classifications in the space provided.

There are more than 26 inhabited structures within a 2-mile radius of the MRS (2011 SI Report, Subchaper 2.2.6).

# Table 8

## EHE Module: Types of Activities/Structures Data Element Table

**DIRECTIONS:** Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present withinn two miles of the MRS and circle the scores that correspond with **all** the activities/structures classifications at the MRS.

**Note:** The term inhabited structure is defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Residential, educational, commercial, or subsistence** | ◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering. | *5* |
| **Parks and recreational areas** | ◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses. | *4* |
| **Agricultural, forestry** | ◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry. | *3* |
| **Industrial or warehousing** | ◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing. | 2 |
| **No known or recurring activities** | ◆ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary. | 1 |
| **TYPES OF ACTIVITIES/STRUCTURES** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | ***5*** |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

The MRS is currently timberland/wetlands and unimproved land with portions being used as pasture. Surrounding land is utilized for residential purposes, an orange grove, a public park, and a boat ramp (2011 SI Report, Subchapter 2.2.8 and Paragraph 6.1.4.3).

# Table 9

## EHE Module: Ecological and/or Cultural Resources Data Element Table

**DIRECTIONS:** Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

**Note:** The terms ecological resources and cultural resources are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Ecological and cultural resources present** | ◆ There are both ecological and cultural resources present on the MRS. | *5* |
| **Ecological resources present** | ◆ There are ecological resources present on the MRS. | 3 |
| **Cultural resources present** | ◆ There are cultural resources present on the MRS. | 3 |
| **No ecological or cultural resources present** | ◆ There are no ecological resources or cultural resources present on the MRS. | 0 |
| **ECOLOGICAL AND/OR CULTURAL RESOURCES** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classifications in the space provided.

The MRS is considered an important ecological place as wetands and potential T&E species and supporting habitat are present (2011 SI Report, Paragraph 5.2.5.9).

Cultural resources are present (2011 SI Report, Paragraph 2.2.10.2).

# Table 10
## Determining the EHE Module Rating

**DIRECTIONS:**

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

**Note:**
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

| | Source | Score | Value |
|---|---|---|---|
| **Explosive Hazard Factor Data Elements** | | | |
| Munitions Type | Table 1 | 2 | 3 |
| Source of Hazard | Table 2 | 1 | |
| **Accessibility Factor Data Elements** | | | |
| Location of Munitions | Table 3 | 1 | 16 |
| Ease of Access | Table 4 | 10 | |
| Status of Property | Table 5 | 5 | |
| **Receptor Factor Data Elements** | | | |
| Population Density | Table 6 | 3 | 18 |
| Population Near Hazard | Table 7 | 5 | |
| Types of Activities/ Structures | Table 8 | 5 | |
| Ecological and /or Cultural Resources | Table 9 | 5 | |
| **EHE MODULE TOTAL** | | | *37* |

| EHE Module Total | EHE Module Rating |
|---|---|
| 92 to 100 | A |
| 82 to 91 | B |
| 71 to 81 | C |
| 60 to 70 | D |
| 48 to 59 | E |
| 38 to 47 | F |
| less than 38 | G |
| Alternative Module Ratings | Evaluation Pending |
| | No Longer Required |
| | ***No Known or Suspected Explosive Hazard*** |
| **EHE MODULE RATING** | ***No Known or Suspected Explosive Hazard*** |

# Table 11

## CHE Module: CWM Configuration Data Element Table

**DIRECTIONS:** Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond to **all** the CWM configurations known or suspected to be present at the MRS.

**Note:** The terms CWM/UXO, CWM/DMM, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **CWM, that are either UXO, or explosively configured damaged DMM** | The CWM known or suspected of being present at the MRS is:<br>◆ CWM that are UXO (i.e., CWM/UXO).<br>◆ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. | 30 |
| **CWM mixed with UXO** | ◆ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. | 25 |
| **CWM, explosive configuration that are undamaged DMM** | ◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. | 20 |
| **CWM/DMM, not explosively configured or CWM, bulk container** | The CWM known or suspected of being present at the MRS is:<br>◆ Nonexplosively configured CWM/DMM either damaged or undamaged<br>◆ Bulk CWM (e.g., ton container). | 15 |
| **CAIS K941 and CAIS K942** | ◆ The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. | 12 |
| **CAIS (chemical agent identification sets)** | ◆ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. | 10 |
| **Evidence of no CWM** | ◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. | *0* |
| **CWM CONFIGURATION** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30). | *0* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

There is no historical evidence that CWM are present on the MRS (2011 SI Report, Subchapters 2.3 and 2.4). Therefore, Tables 12-19 have been omitted.

# Table 20
## Determining the CHE Module Rating

**DIRECTIONS:**

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

**Note:**
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

| | Source | Score | Value |
|---|---|---|---|
| **CWM Hazard Factor Data Elements** | | | |
| CWM Configuration | Table 11 | 0 | 0 |
| Sources of CWM | Table 12 | | |
| **Accessibility Factor Data Elements** | | | |
| Location of CWM | Table 13 | | 0 |
| Ease of Access | Table 14 | | |
| Status of Property | Table 15 | | |
| **Receptor Factor Data Elements** | | | |
| Population Density | Table 16 | | 0 |
| Population Near Hazard | Table 17 | | |
| Types of Activities/ Structures | Table 18 | | |
| Ecological and /or Cultural Resources | Table 19 | | |
| **CHE MODULE TOTAL** | | | *0* |

| CHE Module Total | CHE Module Rating |
|---|---|
| 92 to 100 | A |
| 82 to 91 | B |
| 71 to 81 | C |
| 60 to 70 | D |
| 48 to 59 | E |
| 38 to 47 | F |
| less than 38 | G |
| Alternative Module Ratings | Evaluation Pending |
| | No Longer Required |
| | ***No Known or Suspected CWM Hazard*** |
| **CHE MODULE RATING** | ***No Known or Suspected CWM Hazard*** |

# Table 21

## HHE Module: Groundwater Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's groundwater and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional groundwater contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and display the CHF Value. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

**Note:** Use dissolved, rather than total, metals analyses when both are available.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the groundwater receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer). | H |
| **Potential** | There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer). | M |
| **Limited** | There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only). | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Groundwater MC Hazard ☐

Table 21 Comments: Groundwater was not sampled. Based on the type of munitions activities conducted at the site, it is unlikely that groundwater would have been directly affected by munitions activities. If there were releases of MC to soil as a result of the munitions-related activities, it is possible that the constituents could leach to groundwater at the MRS, however there are no wells on the MRS (2011 SI Report, Subchapters 5.3.2.2 and 5.3.2.6).

# Table 22

## HHE Module: Surface Water – Human Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's surface water and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional surface water contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard for human endpoints present in the surface water, select the box at the bottom of the table.

**Note:** Use dissolved, rather than total, metals analyses when both are available.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |

| | | |
|---|---|---|
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to geological structures or physical controls). | L |

| | | |
|---|---|---|
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to surface water to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to surface water to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to surface water to which contamination has moved or can move. | L |

| | | |
|---|---|---|
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Surface Water (Human Endpoint) MC Hazard ☐

Table 22 Comments: Due to the lack of an appropriate surface water source, no surface water/sediment samples were collected from this MRS. Direct release of MC from munitions activities within the MRSs would be primarily to surface soil. Migration of MC from surface soil to surface water and sediment is possible through runoff and erosion. In addition, based on the munitions used (small arms) at the MRS and former target locations, direct releases of MC to wetlands and to surface water was possible at the MRS (2011 SI Report, Subchapters 5.3.3.2, 5.3.3.4 and 6.2.2).

# Table 23

## HHE Module: Sediment – Human Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's sediment and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional sediment contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to sediment to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to sediment to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to sediment to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Sediment (Human Endpoint) MC Hazard ☐

Table 23 Comments: Due to the lack of an appropriate surface water source, no surface water/sediment samples were collected from this MRS. Direct release of MC from munitions activities within the MRSs would be primarily to surface soil. Migration of MC from surface soil to surface water and sediment is possible through runoff and erosion. In addition, based on the munitions used (small arms) at the MRS and former target locations, direct releases of MC to wetlands and to surface water was possible at the MRS (2011 SI Report, Subchapters 5.3.3.2, 5.3.3.4 and 6.2.2).

# Table 24

## HHE Module: Surface Water – Ecological Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's surface water and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional surface water contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|
| | | | | |

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to surface water to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to surface water to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to surface water to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard ☐

Table 24 Comments: Due to the lack of an appropriate surface water source, no surface water/sediment samples were collected from this MRS. Direct release of MC from munitions activities within the MRSs would be primarily to surface soil. Migration of MC from surface soil to surface water and sediment is possible through runoff and erosion. In addition, based on the munitions used (small arms) at the MRS and former target locations, direct releases of MC to wetlands and to surface water was possible at the MRS (2011 SI Report, Subchapters 5.3.3.2, 5.3.3.4 and 6.2.2).

# Table 25

## HHE Module: Sediment – Ecological Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's sediment and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios together, including any additional sediment contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to sediment to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to sediment to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to sediment to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard ☐

Table 25 Comments: Due to the lack of an appropriate surface water source, no surface water/sediment samples were collected from this MRS. Direct release of MC from munitions activities within the MRSs would be primarily to surface soil. Migration of MC from surface soil to surface water and sediment is possible through runoff and erosion. In addition, based on the munitions used (small arms) at the MRS and former target locations, direct releases of MC to wetlands and to surface water was possible at the MRS (2011 SI Report, Subchapters 5.3.3.2, 5.3.3.4 and 6.2.2).

# Table 26

## HHE Module: Surface Soil Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's surface soil and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional surface soil contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|
| Lead | 30 | 400 | mg/Kg | 0.075 |
| Copper | 4.1 | 3100 | mg/Kg | 0.0013 |
| Antimony | 0.37 | 31 | mg/Kg | 0.012 |

| CHF Scale | CHF Value | Sum The Ratios | 0.088 |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |

| | | |
|---|---|---|
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | *L* |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | *M* |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface soil receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to surface soil to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to surface soil to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to surface soil to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | *M* |

No Known or Suspected Surface Soil MC Hazard ☐

Table 26 Comments: Surface soil samples were analyzed for explosives and MC metals. Explosives were not detected and all metals were detected at a concentration that exceeded the concentration in the ambient samples (2011 SI Report, Tables 5.3 and 5.4). MPF is rated M given available information. RF is rated M given the current land use.

# Table 27

## HHE Module: Supplemental Contaminant Hazard Factor Table

**Contaminant Hazard Factor (CHF)**

**DIRECTIONS:** Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the media in which these contaminants are present. Then record all contaminants, their maximum concentrations and their comparison values (from Appendix B of the Primer) in the table below. Calculate and record the ratio for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF for each medium on the

**Note:** Dissolved, rather than total, metals analyses are used when both are available.

| Media | Contaminant | Maximum Concentration | Comparison Value | Ratio |
|---|---|---|---|---|

# Table 28
## Determining the HHE Module Rating

**DIRECTIONS:**

1. Record the letter values (H, M, L) for the Contaminant Hazard, Migration Pathway, and Receptor Factors for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the Three-Letter Combination boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the HHE Ratings provided below, determine each media's rating (A-G) and record the letter in the corresponding Media Rating box below.

| Media (Source) | Contaminant Hazard Factor Value | Migratory Pathway Factor Value | Receptor Factor Value | Three-Letter Combination (Hs-Ms-Ls) | Media Rating (A-G) |
|---|---|---|---|---|---|
| **Groundwater (Table 21)** | | | | | |
| **Surface Water/Human Endpoint (Table 22)** | | | | | |
| **Sediment/Human Endpoint (Table 23)** | | | | | |
| **Surface Water/Ecological Endpoint (Table 24)** | | | | | |
| **Sediment/Ecological Endpoint (Table 25)** | | | | | |
| **Surface Soil (Table 26)** | L | M | M | MML | E |

**DIRECTIONS (cont.):**

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the HHE Module Rating box.

**Note:**
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

| **HHE MODULE RATING** | ***No Known or Suspected MC Hazard*** |
|---|---|

| **HHE Ratings (for reference only)** | |
|---|---|
| **Combination** | **Rating** |
| HHH | A |
| HHM | B |
| HHL | C |
| HMM | C |
| HML | D |
| MMM | D |
| HLL | E |
| MML | E |
| MLL | F |
| LLL | G |
| Alternative Module Ratings | Evaluation Pending |
| | No Longer Required |
| | ***No Known or Suspected MC Hazard*** |

# Table 29
## MRS Priority

**DIRECTIONS:** In the chart below, circle the letter rating for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical priority for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the MRS Prioriy or Alternative MRS Rating at the bottom of the table.

**Note:** An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

| EHE Rating | Priority | CHE Rating | Priority | HHE Rating | Priority |
|---|---|---|---|---|---|
| | | A | 1 | | |
| A | 2 | B | 2 | A | 2 |
| B | 3 | C | 3 | B | 3 |
| C | 4 | D | 4 | C | 4 |
| D | 5 | E | 5 | D | 5 |
| E | 6 | F | 6 | E | 6 |
| F | 7 | G | 7 | F | 7 |
| G | 8 | | | G | 8 |
| Evaluation Pending | | Evaluation Pending | | Evaluation Pending | |
| No Longer Required | | No Longer Required | | No Longer Required | |
| *No Known or Suspected Explosive Hazard* | | *No Known or Suspected CWM Hazard* | | *No Known or Suspected MC Hazard* | |
| **MRS PRIORITY or ALTERNATIVE MRS RATING** | | | | *No Known Or Suspected Hazard* | |

# Table A

## MRS Background Information

**DIRECTIONS:** Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

**Munitions Response Site Name:** Hand Grenade Court

**Component:** US Army

**Installation/Property Name:** US Army

**Location (City, County, State):** Sumter County, Florida

**Site Name/Project Name (Project No.):** I04FL014301/I04FL014301R02/FL49799F718400

**Date Information Entered/Updated:** 11/30/2011 7:25:46 AM

**Point of Contact (Name/Phone):** Mr. William Spence / 904-232-3459

**Project Phase (check only one):**

| | | | | |
|---|---|---|---|---|
| o PA | n SI | o RI | o FS | o RD |
| o RA-C | o RIP | o RA-O | o RC | o LTM |

**Media Evaluated (check all that apply):**

| | |
|---|---|
| o Groundwater | o Sediment (human receptor) |
| n Surface soil | o Surface Water (ecological receptor) |
| o Sediment (ecological receptor) | o Surface Water (human receptor) |

**MRS Summary:**

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

Leesburg Air Service Center (ASC) Formerly Used Defense Sit (FUDS) was used as a satellite training facility of the Army Air Forces School of Applied Tactics based in Orlando, Florida from 1942 to 1945. The 2010 FUDS Management Information System (FUDSMIS) identified two Munitions Response Sites (MRSs) at the FUDS, MRS01 - 300 Yard Known Distance Rifle Range and MRS02- Hand Grenade Court. Historical documents indicate that the 24.92-acre MRS02-Grenade Court was utilized for a hand grenade range. The potential munitions used at this MRS include practice and fragmentation (HE) hand grenades. Neither MEC nor MD were observed at the MRS during the SI field activities in August 2011 or during the site visit associated with the 1994 INPR.

The MRSPP score was discussed during the initial Technical Project Planning (TPP) meeting and will be discussed during the TPP closeout meeting. Coordination with key stakeholders is accomplished during the TPP meetings. Documentation of TPP team concurrence and a copy of the public notice will be included in Appendix B of the Final SI Report.

Description of Pathways for Human and Ecological Receptors:

| |
|---|
| Direct release of MC from munitions activities within the MRS would be primarily to surface soil. If there were releases of MC to soil as a result of the munitions-related activities, it is possible that the constituents could leach to groundwater at the MRS, however, there are no known wells within the boundaries of the MRS. Neither perennial surface water nor sediment are present on the MRS and are therefore not contaminated. |
| Description of Receptors (Human and Ecological): |
| Based on the current and future land use of this MRS, potential receptors include visitors/recreational users, commercial/industrial workers, and ecological receptors. |

# Table 1

## EHE Module: Munitions Type Data Element Table

**DIRECTIONS:** Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

**Note:** The terms practice munitions, small arms ammunition, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Sensitive** | u UXO that are considered likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions).<br>u Hand grenades containing energetic filler.<br>u Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazardard. | *30* |
| **High explosive (used or damaged)** | u UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."<br>u DMM containing a high-explosive filler that have:<br>n Been damaged by burning or detonation<br>n Deteriorated to the point of instability. | 25 |
| **Pyrotechnic (used or damaged)** | u UXO containing a pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).<br>u DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have:<br>n Been damaged by burning or detonation<br>n Deteriorated to the point of instability. | 20 |
| **High explosive (unused)** | u DMM containing a high explosive filler that:<br>n Have not been damaged by burning or detonation<br>n Are not deteriorated to the point of instability. | 15 |
| **Propellant** | u UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).<br>u DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are:<br>n Damaged by burning or detonation<br>n Deteriorated to the point of instability. | 15 |
| **Bulk secondary high explosives, pyrothechnics, or propellant** | u DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).<br>u DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. | 10 |
| **Pyrotechnic (not used or damaged)** | u DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that:<br>n Have not been damaged by burning or detonation<br>n Are not deteriorated to the point of instability. | 10 |
| **Practice** | u UXO that are practice munitions that are not associated with a sensitive fuze.<br>u DMM that are practice munitions that are not associated with a sensitive fuze and that have not:<br>n Been damaged by burning or detonation<br>n Deteriorated to the point of instability. | *5* |
| **Riot control** | u UXO or DMM containing a riot control agent filler (e.g., tear gas). | 3 |
| **Small arms** | u Used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.]. | 2 |
| **Evidence of no munitions** | u Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. | 0 |
| **MUNITIONS TYPE** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30). | *30* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

Historical documents indicate the potential munitions used at the MRS consist of practice and fragmentation (HE) hand grenades (2011 SI Report, Subchapter 4.4.1 and Paragraph 6.1.5.2).

# Table 2

## EHE Module: Source of Hazard Data Element Table

**DIRECTIONS:** Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with **all** the sources of explosive hazards known or suspected to be present at the MRS.

**Note:** The terms former range, practice munitions, small arms range, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Former range** | u The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones. | *10* |
| **Former munitions treatment (i.e., OB/OD) unit** | u The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal. | 8 |
| **Former practice munitions range** | u The MRS is a former military range on which only practice munitions without sensitive fuzes were used. | 6 |
| **Former maneuver area** | u The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category. | 5 |
| **Former burial pit or other disposal area** | u The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment. | 5 |
| **Former industrial operating facilities** | u The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility. | 4 |
| **Former firing points** | u The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range. | 4 |
| **Former missile or air defense artillery emplacements** | u The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range. | 2 |
| **Former storage or transfer points** | u The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system). | 2 |
| **Former small arms range** | u The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.) | 1 |
| **Evidence of no munitions** | u Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present. | 0 |
| **SOURCE OF HAZARD** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10). | *10* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

Based on previous investigations, the MRS was utilized for a hand grenade range. The potential munitions used at this MRS include practice and fragmentation (HE) hand grenades (2011 SI Report, Subchapter 5.4.4.2).

# Table 3

## EHE Module: Location of Munitions Data Element Table

**DIRECTIONS:** Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

**Note:** The terms confirmed, surface, subsurface, small arms ammunition, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Confirmed surface** | u Physical evidence indicates that there are UXO or DMM on the surface of the MRS.<br>u Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO | 25 |
| **Confirmed subsurface, active** | u Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS,and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.<br>u Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. | 20 |
| **Confirmed subsurface, stable** | u Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.<br>u Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. | 15 |
| **Suspected (physical evidence)** | u There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS. | 10 |
| **Suspected (historical evidence)** | u There is historical evidence indicating that UXO or DMM may be present at the MRS. | *5* |
| **Subsurface, physical constraint** | u There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM. | 2 |
| **Small arms (regardless of location)** | u The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.) | 1 |
| **Evidence of no munitions** | u Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. | 0 |
| **LOCATION OF MUNITIONS** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

Neither MEC nor MD were observed at the MRS during the SI field activities in August 2011 or during the site visit associated with the 1994 INPR. However, the INPR site survey was not conducted in the area of the MRS. Historical documents indicate that the MRS was utilized for a hand grenade range (2011 SI Report, Subchapters 2.4.1, 4.4 and Paragraph 6.1.5.1).

# Table 4

## EHE Module: Ease of Access Data Element Table

**DIRECTIONS:** Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

**Note:** The term barrier is defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **No barrier** | There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible). | *10* |
| **Barrier to MRS access is incomplete** | There is a barrier preventing access to parts of the MRS, but not the entire MRS. | 8 |
| **Barrier to MRS access is complete but not monitored** | There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS. | 5 |
| **Barrier to MRS access is complete and monitored** | There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS. | 0 |
| **EASE OF ACCESS** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10). | *10* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Ease of Access*** classifications in the space provided.

Although a portion of the MRS is fenced, access to the MRS is not restricted (2011 SI Report, Subchapter 5.4.4.1).

# Table 5

## EHE Module: Status of Property Data Element Table

**DIRECTIONS:** Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

| Classification | Description | Score |
|---|---|---|
| **Non-DoD control** | ▫ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. | *5* |
| **Scheduled for transfer from DoD control** | ▫ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied. | 3 |
| **DoD control** | ▫ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year. | 0 |
| **STATUS OF PROPERTY** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Status of Property*** classifications in the space provided.

The MRS is owned by a private corporation (2011 SI Report, Paragraph 6.4.5.3).

# Table 6

## EHE Module: Population Density Data Element Table

**DIRECTIONS:** Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

**Note:** Note: Use the U.S. Census Bureau tract data available to capture the highest population density within a two-mile radius of the perimeter of the MRS.

| Classification | Description | Score |
|---|---|---|
| **> 500 persons per square mile** | u There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located. | 5 |
| **100–500 persons per square mile** | u There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located. | *3* |
| **< 100 persons per square mile** | u There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located. | 1 |
| **POPULATION DENSITY** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *3* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Population Density*** classifications in the space provided.

The MRS is located in Sumter County, Florida. The 2010 US Census indicates that the population density of Sumter County Florida was 170.8 persons per square mile (2011 SI Report, Paragraph 2.2.7.1).

# Table 7

## EHE Module: Population Near Hazard Data Element Table

**DIRECTIONS:** Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and select the score that corresponds with the number of inhabited structures.

**Note:** The term inhabited structures is defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **26 or more inhabited structures** | There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | *5* |
| **16 to 25 inhabited structures** | There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 4 |
| **11 to 15 inhabited structures** | There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 3 |
| **6 to 10 inhabited structures** | There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 2 |
| **1 to 5 inhabited structures** | There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 1 |
| **0 inhabited structures** | There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both. | 0 |
| **POPULATION NEAR HAZARD** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Population Near Hazard*** classifications in the space provided.

There are more than 26 inhabited structures within a 2-mile radius of the MRS (2011 SI Report, Subchaper 2.2.6).

# Table 8

## EHE Module: Types of Activities/Structures Data Element Table

**DIRECTIONS:** Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present withinn two miles of the MRS and circle the scores that correspond with **all** the activities/structures classifications at the MRS.

**Note:** The term inhabited structure is defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Residential, educational, commercial, or subsistence** | u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering. | *5* |
| **Parks and recreational areas** | u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses. | *4* |
| **Agricultural, forestry** | u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry. | *3* |
| **Industrial or warehousing** | u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing. | 2 |
| **No known or recurring activities** | u There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary. | 1 |
| **TYPES OF ACTIVITIES/STRUCTURES** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | ***5*** |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

The MRS is currently undeveloped land being used as pasture. Surrounding land is utilized for residential purposes, an orange grove, a public park, and a boat ramp (2011 SI Report, Subchapter 2.2.8 and Paragraph 6.1.5.3).

# Table 9

## EHE Module: Ecological and/or Cultural Resources Data Element Table

**DIRECTIONS:** Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

**Note:** The terms ecological resources and cultural resources are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **Ecological and cultural resources present** | u There are both ecological and cultural resources present on the MRS. | *5* |
| **Ecological resources present** | u There are ecological resources present on the MRS. | 3 |
| **Cultural resources present** | u There are cultural resources present on the MRS. | 3 |
| **No ecological or cultural resources present** | u There are no ecological resources or cultural resources present on the MRS. | 0 |
| **ECOLOGICAL AND/OR CULTURAL RESOURCES** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5). | *5* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classifications in the space provided.

The MRS is considered an important ecological place as wetands and potential T&E species and supporting habitat are present (2011 SI Report, Paragraph 5.2.5.9).

Cultural resources are present (2011 SI Report, Paragraph 2.2.10.2).

# Table 10
## Determining the EHE Module Rating

**DIRECTIONS:**

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

**Note:**
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

| | Source | Score | Value |
|---|---|---|---|
| **Explosive Hazard Factor Data Elements** | | | |
| Munitions Type | Table 1 | 30 | 40 |
| Source of Hazard | Table 2 | 10 | |
| **Accessibility Factor Data Elements** | | | |
| Location of Munitions | Table 3 | 5 | 20 |
| Ease of Access | Table 4 | 10 | |
| Status of Property | Table 5 | 5 | |
| **Receptor Factor Data Elements** | | | |
| Population Density | Table 6 | 3 | 18 |
| Population Near Hazard | Table 7 | 5 | |
| Types of Activities/ Structures | Table 8 | 5 | |
| Ecological and /or Cultural Resources | Table 9 | 5 | |
| **EHE MODULE TOTAL** | | | *78* |

| EHE Module Total | EHE Module Rating |
|---|---|
| 92 to 100 | A |
| 82 to 91 | B |
| 71 to 81 | *C* |
| 60 to 70 | D |
| 48 to 59 | E |
| 38 to 47 | F |
| less than 38 | G |
| Alternative Module Ratings | Evaluation Pending |
| | No Longer Required |
| | No Known or Suspected Explosive Hazard |
| **EHE MODULE RATING** | *C* |

# Table 11

## CHE Module: CWM Configuration Data Element Table

**DIRECTIONS:** Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond to **all** the CWM configurations known or suspected to be present at the MRS.

**Note:** The terms CWM/UXO, CWM/DMM, physical evidence, and historical evidence are defined in Appendix C of the Primer.

| Classification | Description | Score |
|---|---|---|
| **CWM, that are either UXO, or explosively configured damaged DMM** | The CWM known or suspected of being present at the MRS is:<br>u CWM that are UXO (i.e., CWM/UXO).<br>u Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. | 30 |
| **CWM mixed with UXO** | u The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO. | 25 |
| **CWM, explosive configuration that are undamaged DMM** | u The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. | 20 |
| **CWM/DMM, not explosively configured or CWM, bulk container** | The CWM known or suspected of being present at the MRS is:<br>u Nonexplosively configured CWM/DMM either damaged or undamaged<br>u Bulk CWM (e.g., ton container). | 15 |
| **CAIS K941 and CAIS K942** | u The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. | 12 |
| **CAIS (chemical agent identification sets)** | u CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. | 10 |
| **Evidence of no CWM** | u Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. | *0* |
| **CWM CONFIGURATION** | **DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30). | *0* |

**DIRECTIONS:** Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

There is no historical evidence that CWM are present on the MRS (2011 SI Report, Subchapters 2.3 and 2.4). Therefore, Tables 12-19 have been omitted.

# Table 20
## Determining the CHE Module Rating

**DIRECTIONS:**

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

**Note:**
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

| | Source | Score | Value |
|---|---|---|---|
| **CWM Hazard Factor Data Elements** | | | |
| CWM Configuration | Table 11 | 0 | 0 |
| Sources of CWM | Table 12 | | |
| **Accessibility Factor Data Elements** | | | |
| Location of CWM | Table 13 | | 0 |
| Ease of Access | Table 14 | | |
| Status of Property | Table 15 | | |
| **Receptor Factor Data Elements** | | | |
| Population Density | Table 16 | | 0 |
| Population Near Hazard | Table 17 | | |
| Types of Activities/ Structures | Table 18 | | |
| Ecological and /or Cultural Resources | Table 19 | | |
| **CHE MODULE TOTAL** | | | *0* |

| CHE Module Total | CHE Module Rating |
|---|---|
| 92 to 100 | A |
| 82 to 91 | B |
| 71 to 81 | C |
| 60 to 70 | D |
| 48 to 59 | E |
| 38 to 47 | F |
| less than 38 | G |
| Alternative Module Ratings | Evaluation Pending |
| | No Longer Required |
| | ***No Known or Suspected CWM Hazard*** |
| **CHE MODULE RATING** | ***No Known or Suspected CWM Hazard*** |

# Table 21

## HHE Module: Groundwater Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's groundwater and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional groundwater contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and display the CHF Value. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

**Note:** Use dissolved, rather than total, metals analyses when both are available.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the groundwater receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer). | H |
| **Potential** | There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer). | M |
| **Limited** | There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only). | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |
| | No Known or Suspected Groundwater MC Hazard | o |

Table 21 Comments: Groundwater was not sampled. Based on the type of munitions activities conducted at the site, it is possible that surficial groundwater could have been directly affected by munitions activities. If there were releases of MC to soil as a result of the munitions-related activities, it is possible that the constituents could leach to groundwater at the MRS, however there are no wells on the MRS (2011 SI Report, Subchapters 5.4.2.2 and 5.4.2.6).

# Table 22

## HHE Module: Surface Water – Human Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's surface water and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional surface water contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard for human endpoints present in the surface water, select the box at the bottom of the table.

**Note:** Use dissolved, rather than total, metals analyses when both are available.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|
| | | | | |

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |

| | | |
|---|---|---|
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to surface water to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to surface water to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to surface water to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

| | |
|---|---|
| No Known or Suspected Surface Water (Human Endpoint) MC Hazard | o |

Table 22 Comments: Perennial surface water and sediment are not present on the MRS and are therefore not contaminated (2011 SI Report, Subchapter 5.4.3.6).

# Table 23

## HHE Module: Sediment – Human Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's sediment and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional sediment contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to sediment to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to sediment to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to sediment to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Sediment (Human Endpoint) MC Hazard o

Table 23 Comments: Perennial surface water and sediment are not present on the MRS and are therefore not contaminated (2011 SI Report, Subchapter 5.4.3.6).

# Table 24

## HHE Module: Surface Water – Ecological Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's surface water and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional surface water contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface water receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to surface water to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to surface water to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to surface water to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard o

Table 24 Comments: Perennial surface water and sediment are not present on the MRS and are therefore not contaminated (2011 SI Report, Subchapter 5.4.3.6).

# Table 25

## HHE Module: Sediment – Ecological Endpoint Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's sediment and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios together, including any additional sediment contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the sediment receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to sediment to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to sediment to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to sediment to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

| | |
|---|---|
| No Known or Suspected Sediment (Ecological Endpoint) MC Hazard | o |

Table 25 Comments: Perennial surface water and sediment are not present on the MRS and are therefore not contaminated (2011 SI Report, Subchapter 5.4.3.6).

# Table 26

## HHE Module: Surface Soil Data Element Table

### Contaminant Hazard Factor (CHF)

**DIRECTIONS:** Record the maximum concentrations of all contaminants in the MRS's surface soil and their comparison values (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the contaminant ratios together, including any additional surface soil contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

| Contaminant | Maximum Concentration | Comparison Value | Unit | Ratios |
|---|---|---|---|---|

| CHF Scale | CHF Value | Sum The Ratios | |
|---|---|---|---|
| CHF > 100 | H (High) | $CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$ | |
| 100 > CHF > 2 | M (Medium) | | |
| 2 > CHF | L (Low) | | |

| | | |
|---|---|---|
| **CONTAMINANT HAZARD FACTOR** | **DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H). | |

### Migratory Pathway Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Evident** | Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure. | H |
| **Potential** | Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined. | M |
| **Confined** | Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls). | L |
| **MIGRATORY PATHWAY FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |

### Receptor Factor

**DIRECTIONS:** Circle the value that corresponds most closely to the surface soil receptors at the MRS.

| Classification | Description | Value |
|---|---|---|
| **Identified** | Identified receptors have access to surface soil to which contamination has moved or can move. | H |
| **Potential** | Potential for receptors to have access to surface soil to which contamination has moved or can move. | M |
| **Limited** | Little or no potential for receptors to have access to surface soil to which contamination has moved or can move. | L |
| **RECEPTOR FACTOR** | **DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H). | |
| | No Known or Suspected Surface Soil MC Hazard | n |

Table 26 Comments: Surface soil samples were analyzed for explosives and select metals (iron and zinc). Explosives were not detected and iron and zinc were detected at a concentration that did not exceed the concentration detected in the ambient sample. Therefore, based on the results of the data presented in the SI Report, the surface soil is not contaminated (2011 SI Report, Tables 5.3 and 5.5).

# Table 27

## HHE Module: Supplemental Contaminant Hazard Factor Table

**Contaminant Hazard Factor (CHF)**

**DIRECTIONS:** Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the media in which these contaminants are present. Then record all contaminants, their maximum concentrations and their comparison values (from Appendix B of the Primer) in the table below. Calculate and record the ratio for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF for each medium on the

**Note:** Dissolved, rather than total, metals analyses are used when both are available.

| Media | Contaminant | Maximum Concentration | Comparison Value | Ratio |
|---|---|---|---|---|

# Table 28
## Determining the HHE Module Rating

**DIRECTIONS:**

1. Record the letter values (H, M, L) for the Contaminant Hazard, Migration Pathway, and Receptor Factors for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the Three-Letter Combination boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the HHE Ratings provided below, determine each media's rating (A-G) and record the letter in the corresponding Media Rating box below.

| Media (Source) | Contaminant Hazard Factor Value | Migratory Pathway Factor Value | Receptor Factor Value | Three-Letter Combination (Hs-Ms-Ls) | Media Rating (A-G) |
|---|---|---|---|---|---|
| **Groundwater (Table 21)** | | | | | |
| **Surface Water/Human Endpoint (Table 22)** | | | | | |
| **Sediment/Human Endpoint (Table 23)** | | | | | |
| **Surface Water/Ecological Endpoint (Table 24)** | | | | | |
| **Sediment/Ecological Endpoint (Table 25)** | | | | | |
| **Surface Soil (Table 26)** | | | | | |

**DIRECTIONS (cont.):**

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the HHE Module Rating box.

**Note:**
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

| **HHE MODULE RATING** | ***No Known or Suspected MC Hazard*** |
|---|---|

| **HHE Ratings (for reference only)** | |
|---|---|
| **Combination** | **Rating** |
| HHH | A |
| HHM | B |
| HHL | C |
| HMM | |
| HML | D |
| MMM | |
| HLL | E |
| MML | |
| MLL | F |
| LLL | G |
| Alternative Module Ratings | Evaluation Pending |
| | No Longer Required |
| | ***No Known or Suspected MC Hazard*** |

# Table 29
## MRS Priority

**DIRECTIONS:** In the chart below, circle the letter rating for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical priority for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the MRS Prioriy or Alternative MRS Rating at the bottom of the table.

**Note:** An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

| EHE Rating | Priority | CHE Rating | Priority | HHE Rating | Priority |
|---|---|---|---|---|---|
| | | A | 1 | | |
| A | 2 | B | 2 | A | 2 |
| B | 3 | C | 3 | B | 3 |
| *C* | *4* | D | 4 | C | 4 |
| D | 5 | E | 5 | D | 5 |
| E | 6 | F | 6 | E | 6 |
| F | 7 | G | 7 | F | 7 |
| G | 8 | | | G | 8 |
| Evaluation Pending | | Evaluation Pending | | Evaluation Pending | |
| No Longer Required | | No Longer Required | | No Longer Required | |
| No Known or Suspected Explosive Hazard | | *No Known or Suspected CWM Hazard* | | *No Known or Suspected MC Hazard* | |
| **MRS PRIORITY or ALTERNATIVE MRS RATING** | | | | *4* | |

# APPENDIX L

## Reference Copies

**(ASR documents are too large for print, please see CD for data)**

# Southern Oaks DRI Map H – Master Development Plan

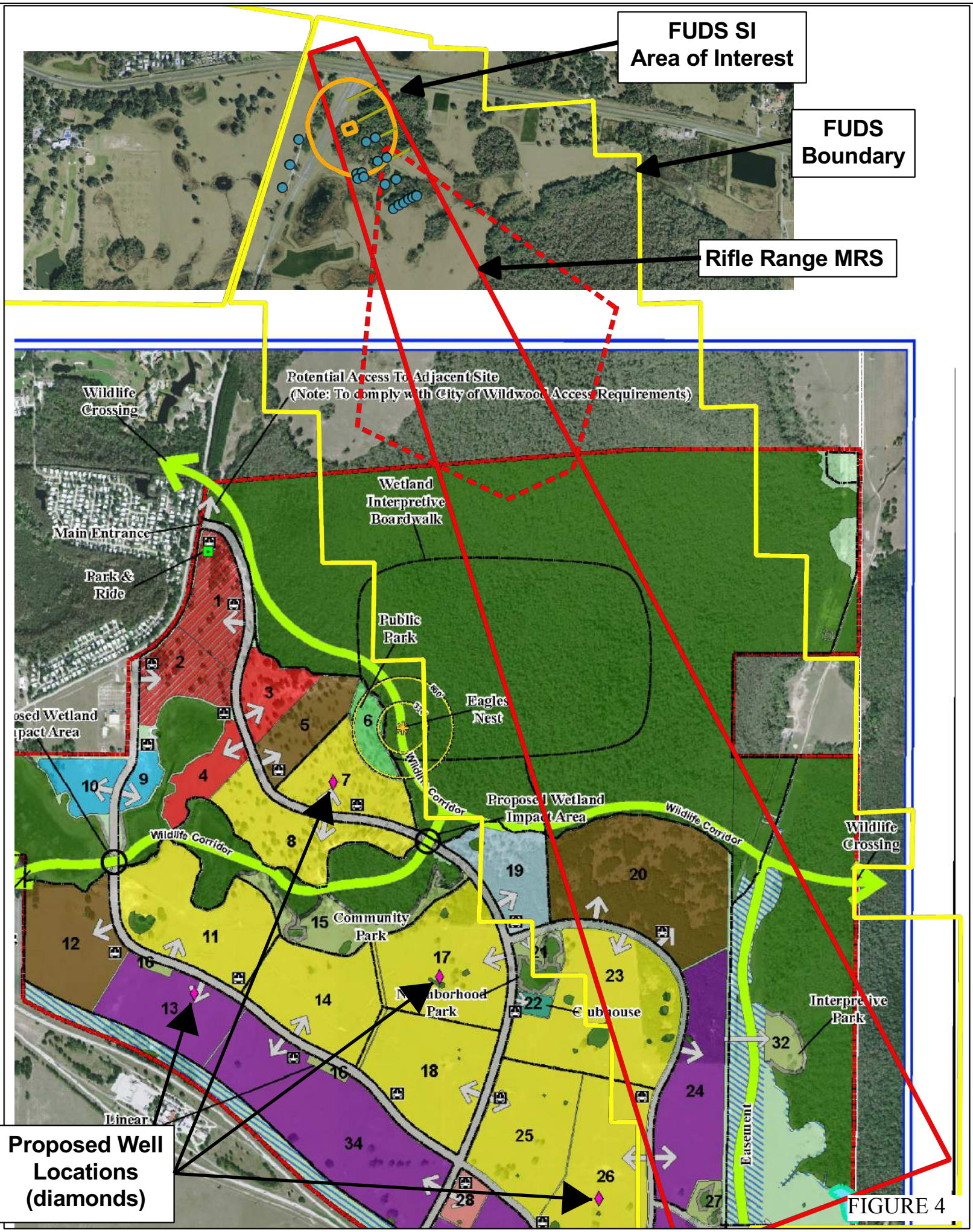



FIGURE 4


**FIGURE 5 - Drainage plan from CR468**

This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850.245.6333 for project review information.

March 11, 2011

Florida Master Site File

Mr. Aaron Sidder
Parsons
1700 Broadway Suite 900
Denver, CO 80290
Phone: 303.764.8814
Email: aaron.sidder@parsons.com

In response to your inquiry of March 8, 2011, the Florida Master Site File lists fifteen previously recorded archaeological sites, and no standing structures in the following parcels of Sumter County:

**T19S, R23E, Sections 25, 26, 35, & 36**

When interpreting the results of our search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Because vandalism and looting are common at Florida sites, we ask that you limit the distribution of location information on archaeological sites.**
- **While many of our records document historically significant resources, the documentation of a resource at the Florida Master Site File does not necessarily mean the resource is historically significant.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850.245.6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Shannon O'Donnell

Shannon O'Donnell
Historical Data Analyst
Florida Master Site File
sko'donnell@dos.state.fl.us

This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850.245.6333 for project review information.

March 11, 2011

Florida Master Site File

Mr. Aaron Sidder
Parsons
1700 Broadway Suite 900
Denver, CO 80290
Phone: 303.764.8814
Email: aaron.sidder@parsons.com

In response to your inquiry of March 8, 2011 the Florida Master Site File lists no previously recorded cultural resources in the following parcel of Lake County:

**T19S, R24E, Section 31**

When interpreting the results of this search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850.245.6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Shannon O'Donnell

Shannon O'Donnell
Historical Data Analyst
Florida Master Site File
sko'donnell@dos.state.fl.us

This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850.245.6333 for project review information.

April 6, 2011

Florida Master Site File

Mr. Gabriel B. Cosyleon
Parsons
1700 Broadway Suite 900
Denver, CO 80290
Phone: 303.764.1915
Email: cosyleon@parsons.com

In response to your inquiry of April 6, 2011, the Florida Master Site File lists nine previously recorded archaeological sites, one resource group, and no standing structures in the following parcels of Sumter County:

**T19S, R23E, Sections 22, 23, & 24**

When interpreting the results of our search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Because vandalism and looting are common at Florida sites, we ask that you limit the distribution of location information on archaeological sites.**
- **While many of our records document historically significant resources, the documentation of a resource at the Florida Master Site File does not necessarily mean the resource is historically significant.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850.245.6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Shannon O'Donnell

Shannon O'Donnell
Historical Data Analyst
Florida Master Site File
sko'donnell@dos.state.fl.us

# Military Munitions Response Data for Range Inventory

| | | |
|---|---|---|
| **Property:** LEESBURG AIR SERVICE CENTER | **FFID:** FL9799F7184 | **Project:** RIFLE RANGE AND STORAGE |
| **City:** WILDWOOD | **State:** FL | **County:** |
| **Major Command:** US Army Corps of Engineers | **Major Subordinate Command:** SAJ/SAD | |

**Property**

**Latitude:** 28 **d** 49 **m** 46 **s** North

**Longitude:** 81 **d** 59 **m** 32 **s** West

Phase Information

Land Use Interest

RAC Scores

**POC Info:**

**Name:** JOHN KEISER **Title:**

**Address:** 701 San Marco Blvd.
Jacksonville, FL 32207

**Phone:** 904-232-1758 **E-Mail:** John.E.Keiser@usace.army.mil

**Total Property Acreage (From FDE):** 2232

**Project Description:**

The site is located six miles west of Leesburg, Florida in Sumter County. The site was developed and known initially as the Orange Home Tent Camp. It was later renamed the Leesburg Air Service Center. The site was a tent camp and had a rifle range. One part of the INPR states there was an ordnance area. Another part says there was an ordnance storage area. The site is currently owned by private individuals, corporations, and Sumter County. There are residences, a public park, and a boat ramp on the site. The remainder is unimproved timber land. It is assumed the ordnance area was an ordnance storage area. The rifle range is reported herein as an area of concern.

Back

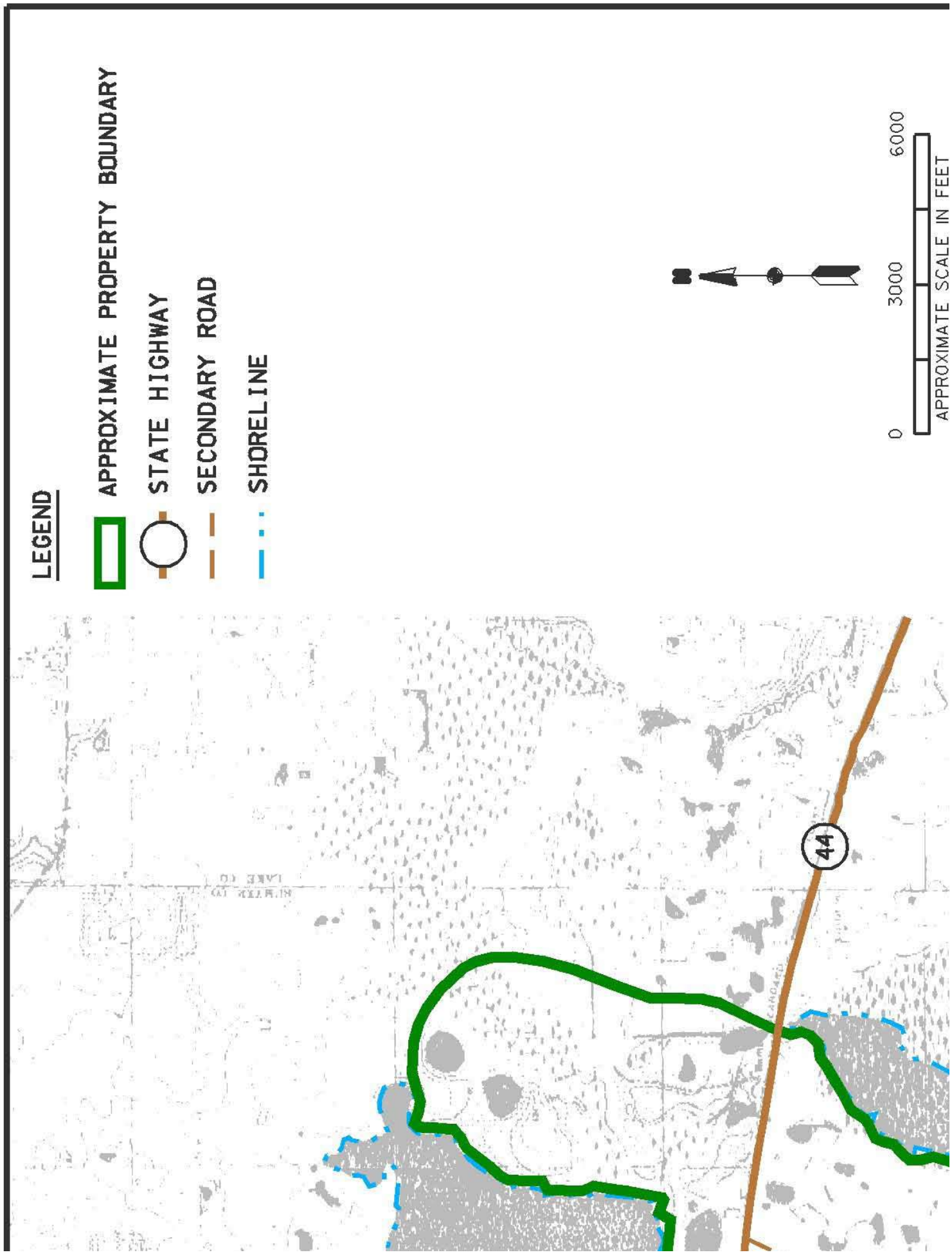
**MMR Name:** Hand Grenade Court

**MMR ID:** I04FL014301R02

## Munitions

| |
|---|
| Hand Grenades, Live |
| Hand Grenades, Practice |

Back


LEGEND
APPROXIMATE PROPERTY BOUNDARY
STATE HIGHWAY
SECONDARY ROAD
SHORELINE
0
3000
6000
APPROXIMATE SCALE IN FEET
44

# Military Munitions Response (MMR) Area

**MMR Name**: 300 Yard Known Distance Rifle Range

**MMR ID**: I04FL014301M01

| | |
|---|---|
| Is this an MMR area? | Yes |
| Is this MMR Area a range? | No |
| Tidal Water Public Exposure Pathway? | No |
| Range Status: | Transferred |
| Construction Date: | 19430629 (YYYYMMDD) |
| Land Use Restrictions: | Restrict land use - No restriction use |

| MMR Area Centroid | | | | |
|---|---|---|---|---|
| Latitude: | 28 **d** | 49 **m** | 10 **s** | NORTH |
| Longitude: | 81 **d** | 58 **m** | 0 **s** | WEST |
| UTM X (meters) | 403442 | | | |
| UTM Y (meters) | 3189199 | | | |
| UTM Zone | 17 | | | |

**Acreages**

| | |
|---|---|
| Land: | 1112 |
| Tidal Water: | 0 |
| Inland Water: | 0 |
| Total Acres | 1112 |

**MMR Acres**

| | |
|---|---|
| Identified: | 0 |
| Suspected: | 1112 |
| Not suspected: | 0 |

Back

Description/Comments | **No Map Available** | Location | Land Use Interest | Ground Water
Historic Use | Current Use
Range Classification | Munitions | Soil/Topography/Vegetation | RAC

**MMR Name:** 300 Yard Known Distance Rifle Range

**MMR ID:** I04FL014301M01

## Historic Use

| Description | Use Priority | Start Year | End Year | Comments |
|---|---|---|---|---|
| Small Arms | 1 | 1942 | 1945 | |

Back

**MMR Name:** 300 Yard Known Distance Rifle Range

**MMR ID:** I04FL014301M01

## Range Classification

Small Arms Range

Back

**MMR Name:** 300 Yard Known Distance Rifle Range

**MMR ID:** I04FL014301M01

## Munitions

Small Arms (expended)

Back

# Military Munitions Response (MMR) Area

**MMR Name**: Hand Grenade Court

**MMR ID**: I04FL014301R02

| | |
|---|---|
| Is this an MMR area? | No |
| Is this MMR Area a range? | Yes |
| Tidal Water Public Exposure Pathway? | No |
| Range Status: | Transferred |
| Construction Date: | 19430101 (YYYYMMDD) |
| Land Use Restrictions: | Restrict land use - No restriction use |

| MMR Area Centroid | | | | |
|---|---|---|---|---|
| Latitude: | 28 **d** | 49 **m** | 10 **s** | NORTH |
| Longitude: | 81 **d** | 58 **m** | 0 **s** | WEST |
| UTM X (meters) | | | | |
| UTM Y (meters) | | | | |
| UTM Zone | 17 | | | |

| **Acreages** | |
|---|---|
| Land: | 24.92 |
| Tidal Water: | 0 |
| Inland Water: | 0 |
| Total Acres | 24.92 |

| **MMR Acres** | |
|---|---|
| Identified: | 0 |
| Suspected: | 24.92 |
| Not suspected: | 0 |

Back

Description/Comments | **No Map Available** | Location | Land Use Interest | Ground Water
Historic Use | Current Use
Range Classification | Munitions | Soil/Topography/Vegetation | RAC

**MMR Name:** Hand Grenade Court

**MMR ID:** I04FL014301R02

## Historic Use

| Description | Use Priority | Start Year | End Year | Comments |
|---|---|---|---|---|
| Hand Grenade | 1 | | | |

Back

**MMR Name:** Hand Grenade Court

**MMR ID:** I04FL014301R02

## Range Classification

Training

Back